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A Sesotho tonal grammar

Khoali, Benjamin Thakampholo, Ph.D.

University of Illinois at Urbana-Champaign, 1991

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A SESOTHO TONAL GRAMMAR

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THESIS

**Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in Linguistics
in the Graduate College of the
University of Illinois at Urbana-Champaign, 1991**

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A SESOTHO TONAL GRAMMAR

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This dissertation is an account of the tonology of Sesotho. A phonological component consisting of such subsystems as the theory of moraic phonology, metrical phonology, autosegmental phonology and prosodic phonology is presupposed. Whenever relevant, I appeal to the principles and rules that govern each of these subsystems.

The main contribution of this thesis is, however, the role played by prosodic domains in the tonology of Sesotho. Four such domains are utilized to constrain the application of tones rules for the language. These are the syllable, the phonological Word (W-domain), the Clitic Group (C-domain) and the Phonological Phrase (P-domain).

Tone rules in Sesotho can be classified into two groups: assimilatory and dissimilatory. Assimilatory rules involve spreading of H tones. There are two types of such H tones: lexical H tones and grammatical H tones. Lexical H tones assimilate by spreading one mora to the right whereas grammatical H tones spread all the way to heads of metrical constituents. Dissimilatory processes, on the other hand, involve various kinds of deletion and delinking of H tones. Such dissimilatory processes are shown to be responses to violations of the OCP. The responses to these violations of

the OCP are different from one dialect of Sesotho to the other.

Tone rules which have been found to be constrained by these prosodic domains are: (1) Meeussen's Rule - a W-domain span rule, (2) Right Branch Delinking - a W-domain and C-domain span rule, (3) High Tone Spreading - a W-domain and a C-domain span rule, (4) Downstepping - a P-domain juncture rule, (5) Left Branch Delinking - a W-domain limit rule, (6) H Tone Insertion - a P-domain limit rule, (7) M Toning - a P-domain limit rule, and so forth.

The interaction between phonology and syntax is also discussed. It is demonstrated that heads which are C-commanded by Chomsky-adjoined constituents are at the ends of P-domains. Otherwise, the extreme right bracket of a X_{max} is the end of a P-domain. Independent syntactic evidence to support the claim concerning the role played by tone in signalling Chomsky-adjoined constituents is advanced.

Dedicated to

My late mother, Malikotsi Selloane,
My late brother, Joseph Dingaane, and
My late friend, Benedict Tseliso Tsiu

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The efforts of my friends and colleagues in the Department of Linguistics are also highly treasured.

Jacynth (Number 10) and Zoann tried in vain to make me an Englishman. As stubborn as always, I stuck to my 'Sesotho English'. I figured it was too late to change a 'Bantu Education' product. Another friend, Frank Rumboll in South Africa can bear witness to this. He also tried in vain. Thank you for agreeing to check my 'English'.

Boni, Jacinth, Willy, Naonangoma (Anne) and I shared not only our miseries with linguistics but also our happiness. The moral support which we gave each other sustained us. Thanks also to Rakesh, Lynn, Wen-Chio, and Kang who came to my rescue during our preparation for the Qualifying Exams. The little I know about computers I owe to Pin-min. I thank her for her patience.

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CHAPTER 1

Introduction

1 Aims and Motivation

In this study we intend to give an exhaustive account of the tonal system of Sesotho, a language of the Sotho group in the South-Eastern Zone of Doke's classification of Bantu languages. The Sotho group includes languages such as Setswana and Sepedi¹. Each of these three languages has several varieties. Our concern will be with Sesotho only and, in particular, with the dialect of Sesotho spoken in Qacha'snek in Lesotho and the Maluti area of what is known as the Republic of South Africa. The writer is a native speaker of this variety.

Several descriptive studies on the tone of Sesotho have already been done. These studies date back to 1955 with G.L. Letele's *The Role of Tone in the Southern Sotho Language* submitted as a thesis for a doctoral degree at the University of London. This thesis was followed by an article by O. Köhler in 1956 entitled *Das Tonsystem des Verbum im Südsoto* in Mitteilungen des instituts für Orientforschung 4. The third work on the sound system of this language was also a doctoral thesis entitled *The Sound System of Sesotho* submitted by D.P. Kunene at the University of Cape Town in 1961. In addition to tone, Kunene's work

¹ Sotho includes several dialects. The standardized dialects of these are called Southern Sotho, North Sotho and Western Sotho for Sesotho, Sepedi and Setswana respectively. Non-literate speakers do not generally know about these official labels.

discusses other aspects of the sound system of the language. Eleven years later Kunene returned to tone in Sesotho with an article entitled *A preliminary study of downstepping in Southern Sotho* in African Studies 31. Given that the Sesotho tonal system has been extensively researched over the past thirty-five years, the question is: why then another doctoral research on the same topic?

We will attempt to provide acceptable motivation for the need to reconsider the tonal system of Sesotho. Firstly, characteristic of all these descriptive studies is the fact that none of them was conceived within the theoretical tenets of modern day linguistics. Very little theory seems to have been promulgated. The aim of all these studies seems to have been to describe the surface tones of the various kinds of sentences of the language and to group the sentences into types according to these surface tone patterns. No theoretical assumptions underlie the descriptions; they appear, consequently, to be merely intent on organizing data and describing the patterns of that data. It follows that it might not be an exaggeration to claim that all these studies satisfy only what Chomsky refers to as the 'observational level' (Chomsky 1986).

This, we would suggest, appears to be also true of a recent study submitted by D.P. Lombard in 1976 as a doctoral dissertation at the University of South Africa. Lombard's work is entitled *Aspekte van Toon in Noord-Sotho*. We have already mentioned that North Sotho (Sepedi) is a language

closely related to Sesotho. Lombard's work of the mid-seventies is still characterized by the neglect of theoretical assumptions to sustain his discussion². This is not surprising because there is a tendency by some practitioners in African linguistics in Southern Africa to neglect theoretical assumptions which would normally lead to principled analyses of the data. Myers observes this tendency in some Zimbabwean linguists (Myers 1987). For the purposes of making preliminary hypotheses, Lombard's work is, however, useful because it describes the surface tonal patterns.

What Lombard does is to summarize what he regards as characteristic of the phonetic facts in the form of what he calls "toonreëls" (tone rules). These "toonreëls" make no predictions about the behavior of tones in Sepedi, however. The work fails to draw on any theoretical assumptions. This neglect of theoretical assumptions in a supposed to be a principled analysis of the data at hand leads us to believe that the Sepedi tone has also yet to be studied intensively.

Our study is, therefore, also a challenge for linguists in Southern Africa to revisit the sound system of the languages of the area with the aim of providing principled

² A conspicuous feature of Lombard's work is the absence of downstepped H tones in Sepedi. William Monareng's dialect, as well as other Sepedi data collected from other dialects similar to Lombard's dialect, seems to have downstepped H tones. This only serves to illustrate that, extensive though Lombard's data might be, they are not necessarily reliable and consistent with the observed phonetic facts of North Sotho.

analyses. Such analyses, we believe, will increase our understanding of the structure of the languages of the area.

Secondly, all these studies (Letele 1955, Kohl r 1956, Kunene 1961, 1972, Lombard 1976) make observations about phonetic facts, but the observations do not appear to be complete. There are serious gaps in the presentation of phonetic facts. Some crucial data revealing the subtle phonetic cues in different syntactic contexts are so flimsy as to be regarded as inadmissible as representative sample for making scientifically valid generalizations. To make it worse, some of these data are inconsistent with that collected by Charles Kisseberth between 1987 and 1988 as well as with our data. Kisseberth's data were collected from a speaker of Sesotho dialect spoken in the Orange Free State. The speaker, Moipone Molotsane, was professionally trained in the hearing of tone. A comparison of her data with ours show that Kisseberth's data are consistent with ours. Where there is a difference, it is a systemic difference in the varieties of Sesotho spoken in the different parts of Southern Africa. Speakers of Sesotho in the south-eastern parts of Lesotho, the Maluti and Herschel use a variety of Sesotho different from the variety spoken in the Orange Free State. In other words, it is both the lack of theory and the unreliability of phonetic facts in past research that justify the need for this study.

Implicit in our motivation is the fact that we have two audiences: international scholars and South African

scholars. Firstly, our aim is to demonstrate that South African scholarship can be enhanced by giving principled analyses rather than merely giving descriptions of the various aspects of the African languages without appeal to some theoretical base. We hope to achieve this by articulating our assumptions from the outset and by following them in our analyses. Where our theory fails to account for the Sesotho data, we hope that future generations of linguists will provide better analyses. Secondly, our analysis will have serious theoretical implications for the research in the phonology-syntax interface. In particular, it will be shown that it is syntax which is primal and not phonology. It will be argued that the theory of Prosodic Hierarchy captures and illuminates this relationship in an interesting way. We will explain the crucial aspects of this in 1.2.

2 Theoretical Assumptions

2.0 Phonological Assumptions

While the analysis of the data will be conceived within the broad tenets of autosegmental phonology particularly as espoused by Goldsmith (1990), it is our intention to embrace specifically the theory of Prosodic Hierarchy as proposed by Selkirk (1984), (1986), Nespor and Vogel (1986), and Chen (1986). A purely autosegmental analysis of the tonal system of Sesotho has been attempted by G. N. Clements in a workshop held at Boston University, Massachusetts in 1988 and also by C.W. Kisseberth in workshops and conference

papers at the University of Illinois, Urbana-Champaign in 1989. These analyses could be viewed as preludes to an in-depth analysis.

Regarding specifics, we will assume that tonal matrices are radically underspecified and privative (Trubetskoy 1967[1939], Archangeli 1984, Pulleyblank 1986). This means that only H(igh) tones will be specified as underlying. We will show that the choice of this radical underspecification is a consequence of language-internal evidence, namely, that only H tones do things in the language. That is, it will be shown that it is only H tones that delete, downstep, spread, and are lowered to M(id) tones, etc., in Sesotho. In short, the other surface tones that are attested in Sesotho are a mere manifestation of some tonal behavior of a H tone.

In addition to the generally known principles in nonlinear phonology such as the W(ell) F(ormedness) C(onditions), the principle of Association Conventions (left to right one-to-one, many-to-one or one-to-many associations of tones to the skeletal tier), Floating tones, etc., the Obligatory Contour Principle (OCP) will be shown to play a significant role in our analysis (Leben 1978, McCarthy 1989, Kenstowicz and Kidda 1984, Odden 1986). The OCP is a principle that forbids sequences of identical features on a given feature matrix. In the case of tone it means that the OCP would disallow a sequence of identical tones in the underlying representations. Since our features will be highly underspecified, it means that no H tones can be

adjacent in the underlying representation because they are the only tones that exist in the underlying structure. However, it is our conclusion that, while the OCP is universal, it is parametric in nature. In the light of this observation, we will show that in Sesotho the last syllable of some words can be allowed to violate the OCP. This violation of the OCP at the right periphery, we will argue, is only tolerated because the language has a mechanism whereby such offensive structures are rectified. The H tone on the last syllable is lowered to a M(id) tone. Concerning what counts as structural adjacency, it will be shown that in Sesotho the following are thus structurally adjacent: one linked H tone adjacent to an unlinked H tone as in (1) below as well as two linked H tones adjacent to each other as in (2) are structurally adjacent. However, two linked H tones separated by a toneless mora or syllable as in (3) are not adjacent.

1(a)	H H	or	H H
	@ @		@ @

2	H H
	@ @

3	H	H
	@ @ @	

The structures in (1), (2), and (3) clearly show that structural adjacency in Sesotho is no different from

structural adjacency in the Karanga dialect of Shona (Hewitt and Prince 1989). We have not devised a structure for two unlinked H tones because it is averred that they are adjacent and are therefore a violation of the OCP.

We will consequently argue that the OCP plays a vital role in the grammar of Sesotho. It will be shown that the varieties of Sesotho are a consequence of the difference in strategies for repairing the violations of the OCP. This will be discussed in Chapter 5 of our thesis.

2.1 Morphological assumptions

The theory of word structure to be assumed in this study will, broadly speaking, be a modified version of the theory articulated in Di Sciullo and Williams (1987) and Selkirk (1986). Di Sciullo and Williams' theory of word structure is based on the assumption that languages are configurational. Their structure is perceived as well-defined and constrained. Word structure, it follows, is binary branching and rules context-free and local. Since the structure is so configurational, the relationship between AFFIXES and ROOTS can be expressed in terms of the X-bar theory. These are the aspects of the theory of word structure we will assume.

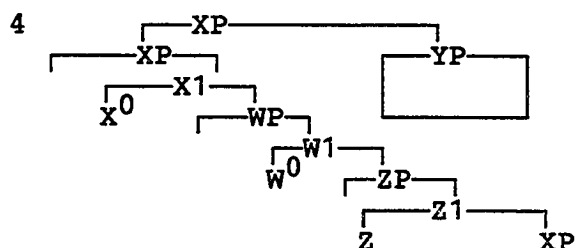
In keeping with the long and rich Dokean tradition wherein Sesotho had been previously analyzed, we have opted to label our morphological objects in terms of the notion of STEM, ROOT, and AFFIX. STEM is therefore an abstract symbol standing for the intermediate level of morphological

projection. ROOT is also an abstract symbol representing Bar 0 in a morphological projection. Since the head of the projection is the right symbol dominated by the STEM (our Bar 1 level), ROOT can act as an argument of the AFFIX. In other words, AFFIXES subcategorize for ROOTS. That is, they cannot make sense without ROOTS. The specifier position in the projection is occupied by clitics such as the reflexive prefix, the object marker (OM), and noun class prefixes (CL). So, linearly counting the morphological objects from left to right, we have the ROOT as the leftmost and last AFFIX head as the rightmost. We will demonstrate these structures for nouns in the introduction to Chapter 2 and for verbs in Chapter 3 .

2.2 Syntactic Assumptions

Of the current theories of syntax the one we will assume is the Government and Binding theory (GB). There are several aspects of this theory which will be presupposed in this study. First, the notion of government will be utilized in its usual sense (Sells 1986:40). The version of C-command involved here is M-command. A lexical head that M-commands another constituent must be sister to the governee. No maximal projection can intervene between the lexical head and the governee. Second, the notion of C-command will be used to distinguish constituents that are not governed by the lexical head but that are C-commanded by such a lexical head. This means that M-command is a subset of C-command. This takes us to the concept of Chomsky-

adjunction. A lexical head can be C-commanded by a Chomsky-adjoined constituent in the sense that the mother node of a Chomsky-adjoined constituent dominates the mother node of the lexical head and the lexical head of the Chomsky-adjoined constituent as in (4) below.



Maximal projections in the diagram are represented by arbitrary letters of the alphabet for convenience. YP in (4) C-commands XP because they both have the same mother node XP. Since YP C-commands XP, it also C-commands all the granddaughter nodes C-commanded by XP. The lexical head (x^0) of XP, however, C-commands WP and ZP. x^0 also M-commands WP but not ZP because the maximal projection WP intervenes between x^0 and ZP.

Thirdly, the notion of M-command will be used to define theta assignment or selection. x^0 in (4) above assigns a theta role to the constituent it M-commands. In other words, x^0 selects WP. At the same time if X is a Case-assigning constituent, it gives Case to the selected constituent WP.

Lastly, we will adopt Abney's views concerning the notion of head in a projection. According to Abney all

projections should be headed by functional not thematic elements (Abney 1987). Noun phrases (NPs) will be headed by determiners (D). That is, Ds are regarded as functional heads for NP projection. For Sesotho, 'qualificative' phrases (adjective, relative, possessive, demonstrative, enumerative and quantitative) are all headed by a particle (Pt) which is their functional element. Conjoined sentences will be headed by conjunctions (Conj) while complex sentences will be headed by a complementizer (Comp) and simple sentences by an Inflectional element (I). Verb phrases (VPs) are selected by I just as NPs are selected by Ds. VPs include copulative phrases (CopP) which is a hybrid category. Prepositions (P) are heads for prepositional phrases (PP). Ps select NPs. Adverbs and ideophones can be subcategorized for by adjectives, relatives, and verbs. Vocatives and interjections stand by themselves independent of the rest of other constituents in a sentence. These are the major constituents of the sentence in Sesotho.

2.3 Prosodic Hierarchy

The theory of Prosodic Hierarchy on which our analysis of Sesotho will be based is the one articulated in Nespor and Vogel (1986). We will take Nespor and Vogel as our major point of reference in spite of the fact that there are several other sources that speak for the theory (Selkirk 1980, Chen 1986, Cohn 1988, Hayes 1989). The central claim of the theory is that phonological rules operate on a prosodically licensed syntactic string. In other words,

there is a subsystem between the syntactic system and the phonological system which provides the syntactic string with acceptable material as input to the phonology. The crucial algorithm for creating prosodic structures on the surface syntactic string as suggested by in Nespor and Vogel (1986) is the one stated as (5) below.

5 Prosodic Constituent Construction

Join into an n-ary branching x^P all x^{P-1} included in a string delimited by the definition of the domain of x^P .

(5) captures the fact that the internal tree structure of prosodic phrases is essentially the same in all languages: a nonterminal unit (x^P) consists of one or more units of the immediately lower category (x^{P-1}), a unit of a given level of the hierarchy is exhaustively contained in the higher unit, and so on (Nespor and Vogel 1986:7). In short, the levels are "strictly layered" (Selkirk 1980).

While we will, by and large, adopt the prosodic units suggested by Nespor and Vogel, we use those that are motivated in Sesotho. The rules will refer to edges of heads of maximal projections within the X-bar theory (Chen 1986, Selkirk 1986). Sesotho rules will refer to the right edges of heads of maximal projections at the syntactic level but at the left edges in morphology. The reason for the change in edges at various levels is that Sesotho is head initial syntactically but head final morphologically. We propose the list in (6) as the prosodic levels for Sesotho.

- 6(a) The syllable
- (b) The Phonological Word (W-domain)
- (c) The Clitic Group (C-domain)
- (d) The Phonological Phrase (P-domain)
- (e) The Intonational Phrase (I-domain)
- (f) The Utterance Phrase (U-domain)

The last two levels (the I-domain and U-domain) will not be discussed because they are not crucial to our discussion. But, should yes and no questions be considered, it would be impossible to avoid these levels. This has been proved beyond doubt in Downing (1989).

2.3.0 The syllable

The first level is the syllable. The syllable can be long or short phonetically. A short syllable has one mora whereas a long syllable has two moras. This is important for our purposes because a mora is a tone-bearing unit (TBU) in Sesotho. This is so even though we will loosely talk about a tone on syllables. The syllable is important because it is the lowest level of prosodic structure in Sesotho. Some languages, Bulgarian, for instance, have the mora as their lowest level of prosodic structure (Zec 1988).

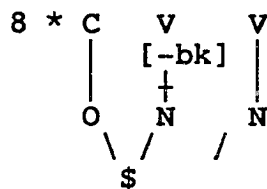
A syllable in Sesotho is unchecked or open. That is, a syllable never has a coda. In (7) we show examples of typical syllables in Sesotho.

7(a)	CV	e.g. mo-re-na	chief	
	(b)	V	e.g. mo-e-ti	traveller
	(c)	VV	e.g. yá-ka	mine
	(d)	CVV	e.g. ma-swa-bí	misery
	(e)	C	e.g. n-tá	

In (7a) each syllable making the noun *morena* consists of a consonant as an onset and a vowel as the nucleus. In (7b) the second syllable of the noun *moeti* consists of a nucleus only. If we assume tenets of moraic phonology, in (7c) the possessive morpheme *yá* in *yá ka* has a syllable that has a vowel delinked from its mora and linked with the onset (Hayes 1989). The vowel surfaces as a palatal glide if the vowel is front and as a labio-velar glide if the vowel is back. The low vowel never participates in this context. It just loses its mora and ultimately deletes through the Stray Erasure Convention. In (7d) the second syllable of the noun *maswabi* consists of an onset made of a consonant and a vowel which is delinked from its mora. The vowel surfaces as a glide. The nucleus of the syllable is the second vowel that remains linked to its mora. In (7e) the first syllable consists of an onset only. However, this onset, unlike other onsets as in (7a) and (7d), is also linked to a mora. This means that consonants such as the nasal in *n-tá* (7e) do carry some tone.

In (7c) Sesotho allows only back vowels to lose their mora and get relinked to the onset. If a sequence resulting from some morphological affixation is CVV and the vowel

closer to the onset is front, then the vowel will delink from its mora and ultimately delete by the Stray Erasure Convention. Front vowels are never part of the onset consisting of a consonant and vowel in Sesotho. This can be expressed in terms of a constraint or filter disallowing a front vowel from linking with an onset that is already linked to a consonant as in (8).



Only nasals and liquids can bear moras if vowels are deleted. So, there is also a restriction on what consonants can be syllabic.

2.3.1 The Phonological Word (W-domain)

The domain for a W-domain is defined in terms of the left edge. This domain includes the right-hand head AFFIX to the ROOT, if the number of the syllables counting from the head is two or more. But, if the number of the syllables is less than two, the domain includes the first Clitic after the ROOT. The Clitic can be a reflexive prefix or an object marker or the noun class prefix of class prefix. The foot must be binary at least. This unit thus contains all prosodic units contained in lower levels. Hence, there is no violation of the Strict Layer Hypothesis.

There is compelling evidence for the W-domain. In Sesotho, nouns of class 9, for instance, consist of a

syllabic nasal prefix as a specifier and the STEM. This syllabic nasal is deleted if, and only if, the STEM consists of more than one syllable as in (9) below. The nasal never deletes if the STEM is monosyllabic as in (10).

9 n-rát-o —> n-tháto —> tháto (love)

CL-ROOT-AFFIX Strengthening Nasal Loss

10. n-f-ó —> n-phó —> mphó —> mphó (gift)

CL-ROOT-AFF Strengthening N/A Place Assim

Nasal Loss is blocked from applying because it would violate a general constraint concerning the minimum number of syllables in every phonological word (W-domain). Some nouns in class 9 have a nasal class prefix. Others do not. Hence, there is an inexplicable asymmetry. This asymmetry in the noun class prefixes for the nouns in Class 9 is therefore accountable only when one assumes that the prosodic word (W-domain) must have at least two syllables. That is, we can give account of the mystery only if we assume that the foot of a prosodic word belonging to class 9 is binary. This requirement for a prosodic word to have a binary foot is also legitimate for adjectives. It will be demonstrated that it is also valid for tone rules on monosyllabic verbs.

Several tone rules apply in this domain. For instance, Meeussen's rule, Fusion, and Left Branch Delinking rules take place in the W-domain. We will discuss these rules in detail in Chapter 2, 3, 4, and 5.

2.3.2 The Clitic Group

The next prosodic level crucial for our analysis is the Clitic Group level (C-domain). The domain of this level includes the functional head and all clitics as well as the phonological word M-commanded by the functional head clitic. The C-domain is the first level that utilizes syntactic information. The functional head and the M-command relation are syntactic concepts. With the IP the AGR and the first phonological word M-commanded by the AGR make a C-domain constituent. Tone rules apply in this domain. HTS, Right Branch Delinking (RBD) and Fusion, are some of the rules typical of this domain, for instance.

2.3.3 The Phonological Phrase (P-domain)

This is the final domain crucial for our analysis. It includes all constituents on the non-recursive side of a lexical head as well as all constituents C-commanded by such a head up to the right edge of the last constituent. The head C-commanded by any constituent on its recursive side is at the right edge of the P-domain and the first left constituent of the constituent that C-commands a head on the recursive is the beginning of the next P-domain. Phonetic modifications in certain syntactic contexts lead one to the belief that Doke's "qualificatives" C-command the head noun as well as the constituents that follow a verb whose Case-assigning quality has been absorbed by the Case Absorber *ya*. We will provide details for NPs in Chapter 2 and 3, and for VPs in Chapter 4 and 5.

A constituent which is within the same P-domain as the next constituent P-governs this next constituent. That is, for every two pairs of constituents in a syntactic string, there is a government relation that is defined in terms of tonal behavior. Tone signals that a P-governor is in the same P-domain as the P-governee. The concept of P-government is borrowed from McHugh, who acknowledges that Tim Stowell coined the concept (McHugh 1990). We will add some other motivation for the P-domain as we discuss NPs in Chapter 2 and VPs in 4. This completes our discussion of Prosodic hierarchies, which we will need in our analyses. This chapter will conclude with summaries of the chapters of this dissertation.

3 Survey of Chapters

Chapter 1 Introduction

The aim and objectives of the study are explained. Matters arising from previous research in this field are used as motivation for this study. Theoretical assumptions which underlie our analyses are discussed. Highlights of other chapters are given.

Chapter 2. Tone and the Structure of the NP (Part I)

This chapter comprises details about the pronunciation of the noun in different positions within the different maximal projections. The discussion commences with the morphology of the noun. Chapter 2 will contain details about the structure and tone of monosyllabic nominals as

well as disyllabic ones. Different syntactic contexts where the tone of the noun changes are examined.

Chapter 3 Tone and Structure of the NP (Part II)

This chapter is a continuation of the discussion on nouns. Nouns with more than two syllables are analyzed. An evaluation of the assimilatory and dissimilatory processes involving H tones on particles is made. The structure of APs is also described. Some proposals regarding hierarchical structure suitable for Sesotho NPs and APs are put forward. These are recommended on the basis of tone evidence. Tone rules are described and used to account for all alternations.

Chapter 4 Tone and Structure of the VP

This chapter addresses basic issues pertaining to the pronunciation of the verb in different syntactic contexts. That is, the tone and structure of the verbal complex are investigated. Different modalities, aspects, and tenses are used to determine the tonal structure of the VP.

Chapter 5 Grammatical H tones: Assimilation and Dissimilation

In this chapter we discuss assimilation and dissimilation in the verbal complex. In other words, this chapter is a continuation of Chapter 4. The difference is in the emphasis. In Chapter 5 we analyze only assimilation and dissimilation as reflected in the behavior of Grammatical H tones. In this chapter we also identify varieties of Sesotho. We need to do this because we will

base our generalizations predominantly on the writer's dialect. This dialect is spoken in the Maluti and Lesotho. This is the dialect typical of the Basothos who have little contact with the closely related Sotho language, namely Setswana and Sepedi. People who have this contact like most of the speakers from the Orange Free State and the Transvaal Basothos have a variety different from the Lesotho, the Herschel and the Maluti people. Our interest is on the role of the OCP in accounting for the differences.

CHAPTER 2

Tone and Structure of NPs (Part 1)

1 Introduction

1.0 Aims and Objectives

In both this Chapter and Chapter 3 we present an analysis of the tone patterns of Sesotho nominals. Doke calls some of these nominals '*substantives*' and others '*qualificatives*' (Doke and Mofokeng 1957). This chapter (Chapter 2) deals with monosyllabic nouns and disyllabic nouns.

Sesotho is a tone language characterized by at least five surface tones namely, high (H), low (L), falling (F), mid (M), and downstepped high (!H). Examples in (1) below are a representative sample of the types of nominals referred to in this study (an acute sign = H(igh), nothing on a character = L(ow) or toneless if underlying, two dots on a character = M(id), one vowel twice in a syllable = long vowel).

- | | |
|----------------------|--------------------|
| 1 (a) mo-reena | chief |
| (b) mo-hóolo | big |
| (c) mo-páláamö | ride |
| (d) le-tlalépepíilwe | illegitimate child |

Example (1a) represents common nouns; (1b) represents an adjectival nominal; (1c) typifies a derived common noun and (1d) a complex derived noun.

In this study we assume, unlike van Wyk (1968) and Lombard (1985) that locatives are not nouns even though they

were historically nominal. That is, words such as *lerole-
ng/leroléng* (dust-at), *masimo-ng/masimóng* (fields-at) are
synchronically more adverbial than nominal. This is, in
fact, correctly expressed in Doke and Mofokeng (1957) as
well as in Guma (1971). Like sentences, these locatives can
be arguments in the predication. As external arguments
locatives occupy the subject position and therefore have to
be concordially related to the predicate. Like sentences in
the same position, the locatives use an invariable H toned
subject marker *hó* as their agreement. Sentences are not
nouns in spite of the fact that they can be arguments.
Locatives too cannot be regarded as nouns purely because
they can be arguments. Hence, we do not regard them as
nominals in this study.

Our task in Chapter 2 is to give an exhaustive analysis
of the surface tonal alternations for monosyllabic and
disyllabic nominals in Sesotho. This task we hope to
achieve by assuming a constrained theory of surface
alternations. This means that our analysis will be based on
assumptions pertaining to the underlying structure and
rules. These assumptions are described in Chapter 1.

The study will consist of a discussion of the
monosyllabic nominals and then the disyllabic ones. Only
non-derived nominals are analyzed in this chapter. (1a) and
(1b) repeated here as (2a) and (2b) respectively, are
examples of underived nouns.

2(a) mo-reena chief

(b) mo-hóolo elder/big

(1c) and (1d) also repeated as (3a) and (3b) respectively are cases of derived nouns.

3(a) mo-pálámö ride

(b) le-tlalépepíilwe illigimate child

The nouns in (3) are derived from the root -palam- (ride) and a combination of roots -tl- (come) and -pep- (carry on back) respectively.

Various studies show that the pronunciation of lexical items differs from one syntactic context to the other. Words in isolation are pronounced differently from words in contexts in most languages. For instance, Cassimjee, observing that the tonal shapes of Venda nominals change depending on whether the nominal is in isolation or on whether it is preceded by a word that ends in a H tone, concludes that there are two crucial environments in Venda tonology namely post-Low and post-High (Cassimjee 1986). In this study we present an analysis of the principles that underlie the different tonal alternations in Sesotho nominals by comparing pronunciations of the nominals in different syntactic contexts to verify whether beyond the purely phonetic environment as proposed in Cassimjee (1986) syntax does not have a role to play in the tonal modification of Sesotho nominals.

We commence by analysing nouns with monosyllabic stems as in (4) below.

4(a) nn-kó	0	nose
(b) moo-ro	0	gravy
(c) mm-phó	0	gift

We will then proceed to disyllabic nouns as in (5) below.

5(a) mo-séehä	00	type of grass
(b) 0-póodi	00	goat
(c) mo-rúuti	00	priest

In (5b) we have an example of noun where the class prefix is a phonologically NULL. The prefix is deleted by a Rule which will be discussed later. In (6) we have examples of trisyllabic nominal stems.

6(a) le-pákéetlä	000	stir
(b) mo-tswebeeré	000	mixture
(c) mo-sébéetsi	000	work

Lastly, in (7) we have stems that consist of four syllables and one with more than four syllables.

7(a) mo-ferefeere	0000	confusion
(b) mo-ikákáasĩ	0000	snob
(c) se-rwáláńkwáanä	00000	praying mantis

(7c) has more than four syllables. Examples (6) and (7) will be discussed in Chapter 3 together with derived nominals.

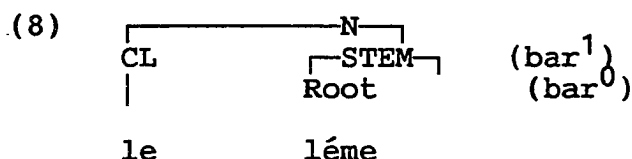
There is an advantage in arranging our discussion in terms of the number of syllables making up a stem. This arrangement makes the task of capturing the facts about the behavior of tones easy. As more affixes are attached to a monosyllabic stem, for instance, we will be able to identify

whether the H tone copies, deletes, spreads, downsteps, shifts or lowers to a M tone. By the time we discuss stems with more syllables, we would have established the behavior of the H tone.

Briefly, we will demonstrate that with the assumptions stated in Chapter 1 and Chapter 2, the tonal alternations in nominals can easily be understood to be the consequence of both assimilatory and dissimilatory processes. If the process is assimilatory, the H will spread and if dissimilatory, the H tone will delink. These processes will be demonstrated to be general, simple, and natural.

1.1 Morphology of the head noun

In line with the morphological assumptions stated in Chapter 1 the structure of an underived in Sesotho is as depicted in (8).



STEM is the Bar 1 level. Several AFFIXES such as diminutives as in (9), augmentatives as in (10), or femininity as in (11) take the ROOTS as their arguments.

9(a) le-léme-ana = leléngwáanä small tongue

(b) le-léme-nyana = leléményaana small tongue

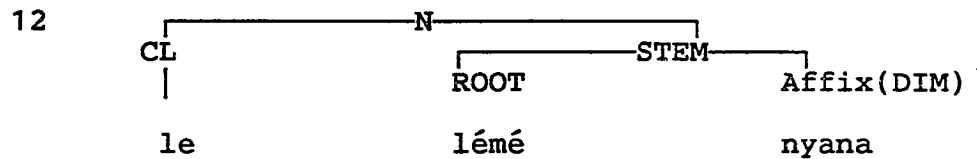
CL-ROOT-DIM

10 le-léme-hadi = leléméhaadi huge tongue

CL-ROOT-AUG

11 0-taú-hadi = taúhádi lioness
 CL-ROOT-FEM

Bearing this in mind, the structure in (8) can be represented as in (12) below:



In our analysis, the ROOT is an irreducible element of the noun and it is the part that carries the core meaning of the noun (see Matthews 1974). Since we use Di Sciullo and Williams (1985), the STEM always dominates the ROOT to make it possible for affixation to take place within it. As more AFFIXES are added, another STEM is added to dominate the one in (12) until the final AFFIX. In this way the STEM remains the intermediate level that acts as the mother node for each head AFFIX on the right-hand of the projection and the daughter STEM on the left.

Sesotho nouns are characterized by 12 noun class prefixes (CL) as in (13) below.

13	CL (class prefix)	Example	Gloss
	1. mo-	mo-rena	chief
	2. ba-	ba-sádi	women
	3. mo-	mo-tse	village
	4. me-	me-tse	villages
	5. le-	le-salé	ear-ring
	6. ma-	ma-salé	ear-rings
	7. se-	se-baka	place

8. di-	di-baka	places
9. n-	n-kú	sheep
10. din-	din-ku	sheep (pl.)
14. bo-	bo-hóbe	bread
15. ho-	ho-shwá	to die

In (13), all the class prefixes are L-toned. These class prefixes are what we call specifiers as the illustration in (12) shows. All nouns will be assumed to be having a specifier even if the specifier is phonologically NULL. In addition to these class prefixes, there is also a H-toned particle *bó* which is used to express the idea of collectivity or plurality. Nouns of class 2(a), nouns of relationships use the *bó* as their plural marker. This H-toned particle *bó* is not a class prefix. Van Wyk argues convincingly that the syntactic distribution as well as semantic associations of this particle suggest that it is not a class prefix but a particle (van Wyk 1985). We will demonstrate tonological evidence in support of this view.

2 Assimilation and Dissimilation in Monosyllabic Nominal Stems

Since we are interested in establishing the tonal patterns for nouns in different syntactic contexts, we will begin by giving examples of monosyllabic nouns in isolation as in (14) and (15) below.

14(a)	leehé	egg
(b)	moorú	forest
(c)	seerá	enemy

- 15(a) mooro gravy
 (b) leeru cloud
 (d) seefi trap

In (14) we have examples of H-toned monosyllabic nouns while in (15) we have examples of toneless monosyllabic stems. In both (14) and (15) the vowel of the prefix is long. In the syntactic context where any of these nouns is a subject of a sentence and the noun is not qualified, the vowel is short. This is illustrated in (16) for H-toned monosyllabic and in (17) for the toneless ones.

- 16 Lehé l!é fedíilë Egg is finished
 Egg AGR finish[Perf]

- 17 Moro ó fedíilë gravy is finished
 Gravy AGR finish

In (16) and (17) the class prefix of the nouns have short vowels. But, note, in (18) and (19) below, that the vowel is long even though the nouns are not in isolation as was the case in (14) and (15) above.

- 18 Lehé lé lehóló l!é fedíilë The big egg is finished
 Egg Pt big AGR finish[Perf]

- 19 Mooro ó mongata ó fedíilë Much gravy is finished
 Gravy Pt much AGR finished

In (18) and (19) the head of the maximal projection is qualified by adjectives lé lehóló and ó mongata respectively. The vowel of the class prefix of the qualified noun is long. In (16) and (17) where the head nouns are not qualified, the vowels are short. The NP is

subject of the sentence in both cases. Note also that the verb in the sentence-final position also has a long penultimate syllable *díi* in *fedíilē*. This observation leads us to suspect that perhaps the characteristic of being long is not necessarily a property of the class prefixes but a resource of the penultimate syllable in certain syntactic contexts. We will, in fact, argue that it is a feature of the penultimate syllables of heads in certain syntactic contexts.

In short, if the noun is in isolation or qualified by adjectives, it has a long penultimate syllable. If, however, the noun is the head of the NP subject which is not qualified, then the penultimate syllable is short. In the light of these facts, we assume that it is not only the phonetic environment that counts in the phonology of Sesotho, but also the syntactic contexts. In other words, while we acknowledge that phonological rules should be conditioned by phonetic environments as a general principle, we should be mindful of the fact that these phonetic environments are sometimes also connected with syntactic contexts. For instance, there is no obvious reason why the same nouns in (16) and (17) should have long penultimate syllables when they are qualified by adjectives in (18) and (19). We will, therefore, look beyond the phonetic environment in this study. We will refer to syntactic contexts in our analysis of the tonal systems of these nouns.

There are several other issues that need explanation. The examples thus far given contain various surface tones. These examples do not show L tones. This may be a source of confusion to some people. In order to avoid that confusion, we need to stress that all vowels that are written without a tone mark should be taken as having a L tone. We show L tones only in making derivation. There are four types of surface tones for the monosyllabic stems, namely, H, !H, L, and M. Downstepped H tones, L tones and M tones are predictable and are therefore not in the underlying structure.

H tones are characteristic of some nouns such as lehé (20) while, at the same time, other monosyllabic stems are characterized by lack of the H tone such as leru (21).

20	leehé	egg
21	leeru	cloud

H tones are unpredictable in the sense that they cannot be substituted without destroying the meaning of the noun as lehe instead of lehé (egg). Lehe is meaningless in Sesotho. L tones could also be argued to be unpredictable in the sense that substituting for them could also destroy the meaning of the noun. However, if we assume that the presence of the H tones in the underlying structure is enough to predict where L tones are found, it is possible to argue that L tones are predictable. For instance, we could argue that L tones are found in all tone-bearing units (TBUs) that are not linked to any of the available surface

tones. In addition, L tones are inert in Sesotho. So, we could argue that L tones are a consequence of default rules. This is, in fact, the argument which we shall be pursuing in this study.

There are M tones as in (22).

22 (a) Ke tsamaya lé móothō I walk with a person

(b) Ke fofa sá léerū I fly like a cloud

M tones are predictable in the sense that they are found only on the final syllable and in situations where a penultimate syllable is bimoraic. The first mora of such a penultimate must have a H tone while the second mora must have a L tone as in móothō (22a) and in léerū (22b). This means that a penultimate syllable of this kind has a F tone. In our analysis a F tone is a contour tone which consists of the first mora having a H tone and second tone having a L tone as illustrated in (22). So, M tones are found in all situations where the penult has a F tone as in (22). We may recall that long vowels are also predictable in the sense that only penultimate syllables of heads qualified and nouns in isolation have long vowels. So, the HL syllable can only be found where Lengthening occurs. This means that there is a relationship between the Lengthening process and the M tone.

There are downstepped !H tones as in (23) below.

23 Ká h!é ke pheha moróoho With an egg I cook veg

Pt egg AGR cook vegetable

!H tones are also predictable because they are found in all situations where there are two H tones adjacent across word boundaries within the same P-phrase as is the case with *ká* and *h!é* in (23). The second H surfaces as a downstepped H. We will show that it is important for the words to be within the same P-phrase for this to take place. Since M tone, !H, and L tone are predictable, we assume that they are not in the underlying structure. Let us briefly expand the rules that allow to predict these alternations.

Let us begin by identifying what happens to the H tone of a monosyllabic noun in different contexts. We will illustrate this by taking a H-toned stem and comparing it with a toneless stem. We will add some suffixes to each stem as in (24) for H-toned stems and (25) for toneless stems.

- | | | | |
|-----|-----|--------------|-------------|
| 24. | (a) | Le-hé-nyáanä | small egg |
| | | CL-egg-DIM | |
| | (b) | Se-sw-áana | small wound |
| | | CL-wound-DIM | |
| | (c) | Le-hé-háadi | huge egg |
| | | CL-egg-huge | |

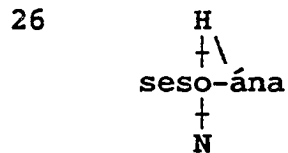
In *lehényáana* (24a) we see a H surfacing one to the right to the lexical H. Recall that the penult vowel is not long underlyingly. So, spreading of H tone occurs one mora to the right. In *seswáana* (24b) if one assumes tenets of moraic phonology, the vowel of the ROOT *só* gets delinked from the nucleus and relinks with the onset as illustrated

in (26) below. The H tone docks onto the next available mora. This mora is linked to the vowel of the diminutive suffix -ana. So, the noun becomes *seswáana*. In short, *seswáana* is a disyllabic noun. The long vowel on the penultimate syllable is consequence of the Lengthening rule to be discussed later. In *lehéháadi* (24c) a H tone surfaces one mora to the right of a lexical H. The noun just takes on an extra mora by Lengthening when it is in isolation or when it is qualified. In (25) none of the suffixes surfaces with a H tone.

- | | | |
|-------|-------------------|----------------|
| 25(a) | Le-ro-nyaana | small juice |
| | CL-juice-DIM | |
| (b) | Le-rw-aana | little juice |
| | CL-juice-DIM | |
| (c) | Le-ro-haadi | Too much juice |
| | CL-juice-too much | |

Since *ro* in *lero* does not have a H underlyingly, there is no H that surfaces on the suffixes *nyana*, *ana* and *hadi* in (25a), (25b) and (25c) respectively. This means that these suffixes do not have a H underlyingly. The H which the suffixes have in (24) for *lehényáaná*, and *lehéháadi* must be the result of the spread of the H from the monosyllabic stem. We believe that the H on the suffixes is a result of spreading because it does not show up on the affixes that follow nominal stems that do not have a H underlyingly as in (25) above.

In *seswáana* (24) we notice that the deletion of a mora when the the vowel is linked to the onset does not lead to the loss of the lexical H tone. The H tone just latches onto the mora of the suffix *-ana* as demonstrated (26) below.



The *o* (26) is no longer linked to the nucleus (N). Clements, in expressing the same idea argues that the rule disassociates the segment from the V to which it is linked and reassociates it to the preceding C-unit (Clements 1986). So, for example *seswáana* (24b) illustrates Stability of tones (Goldsmith 1990). In other words, spreading has not taken place in *seswáana* (24b). *Seswáana* (24b) is just a bisyllabic stem with a long penult vowel instead of a trisyllabic one as *lehényáanã* (24a) and *lehéháadĩ* (24c).

In addition to the surfacing of a H one mora to the right of the lexical H, we also notice that an M tone surfaces in *lehényáanã* (24a) and *lehéháadĩ* (24c). We will discuss the M tone in our treatment of disyllabic nouns in 4.2 below. At this stage, we rather make a few further observations. Firstly, the M tone is found only on the final syllable and in situations where the penult syllable is long. Secondly, not all long penult syllables are followed by a M tone. In (25), for instance, none of the nouns surface with a M tone on the last syllable even though

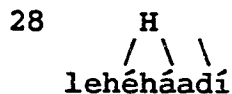
the penult syllables are long. It follows that Lengthening as such is independent of the M tone. Thirdly, the M tone shows up only with long penult syllables that have a H tone on the first mora and a L tone on the second mora. This suggests that a M tone is dependent on a F tone on the penult syllable. What, however, could be the source of this M tone?

To facilitate our discussion, we provide preliminary proposals for this M tone. Firstly, if our assumption about the underlying structure of these nouns is correct, we are left with few alternatives for the source of this M tone. One such alternative would be to assume that the M tone is connected with the H tone that spreads one mora to the right. For this assumption to be valid, we would also have to assume that there is yet another spreading one mora to the right. The second spreading would spread a H tone up to the last syllable as in (27) below.

27 H
 / \ \
 lehéhádí

We should recall that long vowels are derived in Sesotho. This is reiterated because we want to exclude the extra mora on the penult from this H Tone Spreading. In other words, H Tone Spreading has to be ordered before Lengthening lest the second mora on the penult becomes the target for the H tone spreading. After spreading we have a multiply-linked structure as illustrated in (27).

The second stage in the assumption is to claim that Lengthening applies. The penult syllable of the multiply-linked H then acquires an extra mora. A structure as in (28) results.



In (28) above the structure contains a toneless mora on the penultimate syllable. When default rules apply, they insert L tone to all toneless mora. This mora must also get a L by default rules. But the mora is within a multiply-linked H tone. Insertion of the default L tone must consequently cross association lines. This state of affairs is highly undesirable. Although attempts at salvaging the proposal (which we will discuss in 4.2 below) are possible, it should suffice to say at this stage that we cannot derive the M tone from a multiply-linked H tone.

Besides there is ample evidence to show that H Tone spreading is limited to one mora to the right. We could demonstrate this evidence by adding more syllables to the H-toned nouns in (24). We will reduplicate the stems because there are no affixes with more than two syllables in Sesotho. Reduplication in Sesotho involves copying the last two syllables of the stem once. In (29) below we have examples of H-toned monosyllabic noun stems that have been reduplicated.

- 29(a) Le-hé-nyána-nyaana LHHLLLL very small egg
CL-egg-DIM-DIM Redupl
- (b) Le-h-ánáa-nä LHHLM very small egg
CL-egg-DIM-DIM Redupl
- (c) Le-hé-hádi-haadi LHHLLLL very big egg
CL-egg-AUG-AUG Redupl

(29a) and (29c) are examples of diminutive nouns with a reduplicated diminutive suffix and a reduplicated augmentative suffix respectively. The H tone just spreads one mora to the right in both cases. If the H tone spreading were iterative, all the syllables would surface with a H tone. Instead, only the first two syllable surface with a H tone. So lexical H tone spreading is not iterative.

However, reduplicating a stem with a vowel-initial affix as in lehánáanä (29b) gives us the same tonal patterns as in lehényáanä (24a) and lehéháadi (24c). Once again, we see a M tone surfacing on the last syllable. We are also aware of the fact that the penult syllables in lehényánanyaana (29a) and in lehéhádihaadi (29c) are long. So it is not just a long penult but a penult that has a F tone that is required for the M tone. This observation immediately calls attention to seswáana (24b) where the penult has a F tone in that the first mora has a H tone and the second one a L tone, yet there is no M tone on the final syllable. The difference between seswáana and lehánáanä (29b), lehényáanä (24a) and lehéháadi (24c) is that seswáana

is bisyllabic while (29b), (24a) and (24c) are all trisyllabic. This also holds true for verbs where the last syllable of the trisyllabic H-toned infinitive verb stem is always pronounced with a M tone in isolation as (30c) below shows.

- 30(a) hoo já to eat
 (b) ho réeka to buy
 (c) ho rékíisä to sell
 (d) ho kgúrúmetsa to cover

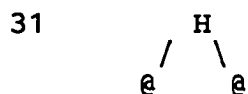
In light of rékíisä (30c) and the trisyllabic noun stems, one may even be tempted to conjecture that the M tone is inserted at the right edge of any trisyllabic word that has a F tone on the penult. The temptation to assume that the M tone has something to do with the number of syllables is justified by the absence of the M tone on the final syllable of a four syllable verb such as kgúrúmeetsa (30d). Such a conjecture is, however, questionable because it suggests that phonological rules can count. As a general principle, rules that count are discouraged in phonology. Rules need to be local. Several linguists have proposed conditions that restrict phonological rules to Locality Conditions (Cole 1987, Meyers 1987, Archangeli and Pulleyblank 1986).

Another problem with the conjecture that a M tone is inserted, is that in our underlying structure there are no M tones. Where do these M tones originate? Since we have only H tones in the underlying structure, the H tones are always there to be used. We therefore amend the conjecture

by assuming that it is a H tone that is inserted. This proposal is consistent with the fact that only H tones exist in the underlying structure. However, the amended conjecture is still inconsistent with the basic principle in phonology, namely, that phonological rules should not be allowed to count, because we insert these H tones on the last syllable of trisyllabic nouns that have a F tone. We therefore need more evidence to uncover the conditions under which this H tone is inserted.

There is a theoretical advantage in proposing that the H tone is inserted. If the H tone is inserted on the last syllable, it becomes adjacent to a H tone on the penult. The extra mora can be added in the penult. This extra mora will therefore be outside the multiply-linked H tone. When default rules apply, the L tone that gets linked will not cross association lines. As we present various data, it will be shown that the proposal also has empirical values.

We have discussed several phonological rules without delving into details. One of these rules is H Tone Spreading. We demonstrated why we believe that the surfacing of H next to another is an example of assimilation. In other words, we argued that the HH surface forms are a consequence of the H Tone Spreading Rule. Let us discuss this assimilatory process in Sesotho. We formalize this H spreading in (31) below.



This rule simply avers that a H tone spreads one to the right. The rule is assimilatory in nature. Rule (31) explains the surfacing of the H tone on the first syllable of the toneless suffixes in (23a), (23c), and (26). These are repeated as (32) below.

- | | | |
|-------|-----------------|----------------|
| 32(a) | lehényáanä | small egg |
| (b) | lehéháadi | big egg |
| (c) | lehényánanyaana | very small egg |
| (d) | lehánáanä | very small egg |
| (e) | lehéhádihaadi | very big egg |

In (32) the first two syllables of the stems are H-toned. We have already established that the first H tone is lexical. We have also established that the second H tone is the consequence of the lexical H tone spreading. Our comparison of the forms in (32) with those where the lexical stem is toneless demonstrated decisively that the toneless suffixes remain toneless until they acquire L tones by default rules.

The exact nature of the H Tone Spreading Rule is, however, not obvious. Firstly, the H tone does not spread if the toneless syllable after the lexical H tone belongs to another word as in (33) below.

- | | | | | |
|-------|-----------------------|-----------------|-------|-------|
| 33(a) | Ke fá lehé moro | I give an egg | gravy | |
| | AGR | give | egg | gravy |
| (b) | Ke batlela sesú mollo | I want coal for | fire | |
| | AGR | want-APPL | coal | fire |

The lexical H tone on *hé* (33a) and *sú* (33b) does not spread one mora to the right even though the words that follow the noun stems are toneless. This means that if H tone spreading were to be allowed to apply, the sentences would be ungrammatical as in (34).

34(a) *Ke fá lehé móorō

(b) *Ke batlela sesú móllo.

The fact that the class prefixes of the second NP object in (33) are H-toned makes these pronunciations unacceptable. So, a lexical H tone does not spread to toneless TBUs across word boundaries. This fact may tempt us to conclude that H Tone Spreading is a lexical rule. However, since a H tone on clitics spreads as in (35) below, one cannot conclude that HTS is a lexical rule.

35(a) Ke tsamaya lé móothō I walk with a person

AGR walk with person

(b) Ke na lé léerō I have juice

AGR have with juice

In (35) we notice that the H tone on the particles spreads one to the right. If particles are lexical items like other lexical items, there is no reason why the H tone on them should spread one to the right. In other words, that HTS applies in (35) suggests that the claim that HTS is lexical is untenable. However, to suggest that HTS is postlexical is equally untenable, because we know that in (34) unacceptable pronunciations are generated if HTS applies postlexically. We address these problems in (4.3) below.

The paradox pertaining to the exact status of HTS is not the only problem. The H tone on particles spreads one to the right provided there are toneless particles or clitics within its reach. If the next toneless TBU is a syllable of the stem, then HTS does not apply. Examples in (36) below illustrate clearly that HTS does not apply.

36(a) Ke tsamaya lée rū lé hodímo

AGR walk Pt cloud Pt up

I walk with a cloud up there

(b) Ke na lée rō lé lengata.

AGR have Pt juice much

I have much juice

In (36) we have examples of toneless monosyllabic stems that occur without their class prefixes. Noun class prefixes are optional in some classes in Sesotho. For instance, nouns of classes 5, 7, 8, 10, and 14 can be used in a sentence without their class prefixes. Examples are in (37a) for class 5, (37b) for class 7, (37c) for class 8, (37d) for class 10, and (37e) for class 14.

37(a) le-sálé/sálé l!é teng The ear-ring is there

CL-ear-ring COP there

37(b) se-diba/diba sé teng The well is there

CL-well COP there

37(c) di-diba/diba dí teng Wells are there

CL-well COP there

37(e) di-kgomó/kgomó d!í teng Cattle are there

CL-cattle COP there

37(f) bo-hóbé/hóbé b!ó teng Bread is there
 CL-bread COP there

In short, each of the examples in (37) shows that there is a regular prefix and a phonologically NULL one. The class prefixes are in free variation. The point, however, is to show that in léé rü (36a) and in léé rō (36b) the H tone on the particle does not spread one to the right as is expected. It does not spread into the stem. This cannot be demonstrated easily because the stems are too short. Hence, by showing several other examples where the nouns are used without their class prefixes, it can be demonstrated that the H tone does not spread into the stem as in (38) below.

- 38(a) Ke na lé ^H [lé[kaala]] lé leetle I have nice branch
 AGR have Pt CL-branch Pt nice
- (b) Ke na lé ^H [0[kaala]] lé leetle. same as above
 AGR have Pt 0-branch Pt nice
- (c) Ke na lé ^H [léé[rō]] lé lengaata I have much juice
 AGR have Pt juice Pt much
- (d) Ke na léé ^H [0[rō]] lé lengaata same as above
 AGR have PT juice much
 Pt branch

Recall that the long vowel in lee rō (38c) and (38d) is the result of Lengthening which is crucially ordered after the H tone spreading. In lé lékaala (38a) and in lé léerō (38c) the H tone from the particle spreads one mora to the right.

The class prefixes are both H-toned. In lé kaala (38b) and lée rō (38d) the H tone on the particle does not spread one mora to the right because each noun does not have a class prefix. So, the H tone from the particles only target toneless clitics within their reach. Such H tones never target toneless TBUs belonging to a stem. The first syllable of the STEM remains toneless even if there is a H tone particle preceding it. The STEM is like an island. Having said that the H tone from the particles cannot spread into the STEMS, it might be appropriate to recall our discussion of the M tone.

We have argued that there is compelling evidence to suggest that the M tone is a consequence of H tone Insertion. We left that discussion in abeyance because the evidence was not adequate. The fact that the STEMS are like islands to the spreading rule provides us with compelling evidence to show that the M tone is, in fact, a result of the insertion of a H tone on the last syllable if the words are in certain syntactic and phonetic contexts. Here are some examples (39) below of nouns that can stand without their class prefixes in the contexts where the M tones surface.

39(a) ó na lé ^H [sée[thö]] sé setle

AGR has PT manners Pt nice

He has good manners

(b) ó na lé ^H [lée[rö]] lé lengata

AGR has Pt juice much

He has much juice

In lé séethö (39a) and in lé léerö (39b) we know that seetho and leero are toneless nouns. They both surface with L tones in isolation. We also know that their prefixes are optional. In addition, we are aware that the H tone on the particles does not spread into the STEMS. So, examples of these nouns when they are preceded by H-toned particles should provide us with some decisive evidence supporting our analysis that the M tone derives from an independent H tone. This illustration is shown in (40) below where the toneless STEMS tho and ro surface with a M tone.

40(a) ó na lée thö sé setle UR lé ^H [tho]

AGR has Pt manners Pt nice

He has good manners

(b) ó na lée rö lé lengata UR lé ^H [ro]

AGR has Pt juice Pt much

He has much juice

In (40) there is no way we can attribute the M tone that suddenly surfaces on the toneless stems to the H tone on the particle because we know that H tone from the

particles never spread into the stems. STEMS are islands to the spreading of the H tones. To show conclusively that it is not the M tone which is inserted but a H tone we present H-toned monosyllabic stems. That the H-toned stems surface with a M tone in this context show that the M tone must have been a H tone. In other words, in the situation where a toneless stem and a H-toned stem are preceded by a H-toned particle, complete neutralization occurs. This is illustrated in (41) below.

H
|

41(a) Ke na lée thō sé settle UR lé [tho]

AGR has Pt manners Pt nice

I have good manners

H H
| |

(b) Ke na lée hē lá ka UR lé [hé]

AGR has Pt egg Pt mine

He has my egg

In lée thō (40a) the particle is H-toned. The stem is toneless. In lée hē (40b) the particle is H-toned. The stem is also H-toned. In both examples the vowel of the penultimate syllable is lengthened. Both stems surface with a M tone. Since H tones surface as M tones in this environment, there is reason to believe that what is inserted in this context is a H tone. In other words, the toneless stem tho (40a) acquires a H by insertion. The H-toned stem hé (40b) already has a H tone. It therefore does not need a H tone. The inserted H tone on the toneless stem and the H tone of

the H-toned one end up pronounced in the same way. They both surface as a M tone. We, therefore, rule out any possibility that the M tone is a surface manifestation of a multiply-linked H tone as well as the possibility of the inserted tone being the M tone itself. We will come back to this discussion in section (3) below.

The last issue concerning monosyllabic stems is the fact that the class prefix of the monosyllabic stem is H-toned only if the stem is toneless as in (42).

- 42 (a) ó na lé léro He has juice
 (b) Hó na lé máru It's cloudy

In (42a) and (42b) the monosyllabic ROOTs ro and ru respectively are toneless. We have demonstrated that class prefixes are all toneless in Sesotho. We have also shown that they surface with a H tone if preceded by a H-toned particles as the lé in (42). We therefore conclude that it is the lé that contributes this H tone. We supported this by showing examples where there were no H-toned particles preceding toneless nouns as in (43) below.

- 43(a) Ha á na lero He does not have a juice
 (b) Ha hó na maru There are no clouds.

In (43) the H-toned particle lé is excluded since the associative copula is in the negative. In the positive, the associative copula consists of na followed by lé as in (42). The H-toned particles are indeed the ones that contribute the H tone on the class prefixes of nouns.

In (44), however, there is no change in the tone of the class prefix. It remains toneless until it becomes low (L) by default rules. This is so, in spite of the fact that the nouns are preceded by a H toned particle.

44 (a) ó na lé lee[hé]

 He has an egg

(b) ó na lé see[hó]

 He has a calabash

Examples (44) seem to be contradicting the claim that the H on the particle spreads one to the right. In (44) the H appears not to have spread. To the contrary we argue that the H tone spreads one mora to the right, thereby becoming adjacent to another H on hé or hó in (44a) and (44b), respectively. Once the Hs are adjacent, there is a violation of the OCP. This violation is rectified by delinking one of the H tones. The H tone that disassociates is the right branch H tone. This is a dissimilatory process. We formulate the rule in (45).

45 H H

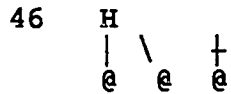
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 @ @ @

So, delinking is a repair strategy to rectify violations of the OCP. In other words, we argue that the examples in (44) are not counterexamples to spreading.

The proposal that the examples in (44) involves spreading followed by delinking is not the only possible

one. It could be argued that the H tone spreading rule has a structure as represented in (46) below.



The structure in (46) captures the idea that the H tone spreading does not take place if, and only if, there is a linked TBU after the target. There are problems with this rule in Sesotho. First, there is just no evidence in the language that H tones do not spread if there is a linked H tone in the succeeding syllable. For instance, in (47) below, HTS applies even though the next syllable after the target is H-toned.

47(a) Ke fá p!ódí théepë I give a goat pigweed

AGR give goat pigweed

(b) Ke rá tá p!óodi I like a goat

AGR like goat

In p!ódí (47a) and in rá tá (47b) we will show that the H on the first syllable of the lexical items spreads one mora to the right. This means that HTS applies in the items in (47) in spite of the fact that there is H tone on the syllable immediately after the targeted toneless TBU. According to Rule (46) spreading should not take place. So, Rule (46) generates both ungrammatical and grammatical ones. The proposal is therefore flawed.

Secondly, the rule is undesirable in that it allows phonological rules to look beyond the targets. The rule therefore violates the Locality Condition (Myers 1987, Cole

1987). We will therefore reject this proposal for an analysis which comprises two processes, namely, H tone spreading and then Right Branch Delinking. We will come back to these rules in section (3) where a discussion of particles is made.

In summing up this section of our study, we note the following:

- (a) The lexical H on a monosyllabic stem spreads one to the right depending on the availability of toneless TBUs within the stem.
- (b) The H on a particle spreads one to the right. It anchors on the noun class prefix. The H tone on the particles does not spread into the stems. The H tone spreads and delinks if there is H tone on the succeeding syllable.
- (c) A M tone surfaces on the last syllable of a constituent which is at the right edge of a sentence or between a head noun and the word that qualifies it. The penult in each case has a long vowel whose first mora is H-toned and the second mora is L-toned.
- (d) A lexical H tone does not spread to toneless TBUs that belong to different words. The H tone on the particle, however, spreads across to toneless class prefixes across word boundaries.

There are paradoxes that are still unsolved in these data. It will be our task to solve them in the following sections

of our research. We conclude this section with a preliminary derivation that accounts for the facts thus far analyzed.

8	H ↓	
	lehényana	U R
	lehényána	HTS
	-----	R Branch Delinking
	lehényáná	H Insertion
	lehényáaná	Lengthening
	lèhényáàná	Default Rule
	lèhényáànä	M Toning
	lèhényáànä	P R

Some of the rules in (48) have not been motivated so far. H Insertion, Lengthening and M Toning, for instance, take place at the end of a P-domain. We have not tried to motivate for these domains. We will therefore spend some time in section (3) below discussing domains that will give credibility to our assumptions.

3 Syntactic Contexts for Tonal Modifications

In section (2) above we mentioned several possible pronunciations of monosyllabic nominal stems. In this section we discuss tonal alternations of disyllabic noun stems. Each syllable is characterised by a tone. In (49) below we give all possible surface tones for disyllabic nominals at the end of a P-domain. Although we have not yet discussed P-domains, we will refer to the syntactic position between the head noun and the postnominal modifiers

(qualificatives in Dokean terms), the last word on the right edge of a sentence, or a word in isolation as ends of P-domains.

- | | | | |
|-------|-----------|------|---------------|
| 49(a) | le-rwáana | L-FL | ant |
| (b) | mo-sáadi | L-FM | woman |
| (c) | se-nyaamó | L-LH | courting game |
| (d) | le-reete | L-LL | testicle |

In (50), however, we see some changes in the pronunciations of some of the nominals in non-ends of a P-domain. The head noun is not modified by a postnominal modifier and is not at the right edge of a sentence or in isolation.

- | | | | |
|-------|----------|------|---------------|
| 50(a) | le-rwáná | L-HH | ant |
| (b) | mo-sádi | L-HL | woman |
| (c) | se-nyamó | L-LH | courting game |
| (d) | le-rete | L-LL | testicle |

We note that LFL in (49a) alternates with LHH in (50a), LFM in (49b) with LHL in (50b) and the rest remain unchanged. However, in (51) below we also note that (49c) and (49d), which do not show any alternations when compared with their respective counterparts in (50), have alternations in another context. This happens where high toned particles precede the nominals.

- | | | | |
|-------|-----------------|--------|-----------------|
| 51(a) |sá lerwáana | H L-FL | like ant |
| (b) |bá mosáadi | H L-FM | of woman |
| (c) |lá sényaamó | H H-LH | of c.game |
| (d) |lé léreete | H H-LL | with a testicle |

In lé sényamó (51c) and lé léreete (51d) we observe that the class prefix has a H tone. This H tone, however, does not surface in sá lerwáana (51a) or in bá mosáadī (51b). We are here reminded of monosyllabic nominals in lé leehé (25) and lé móothö (26) above where in (26) the class prefix (le-) receives the H tone and in (25) the class prefix (mo-) does not. Also, we are reminded of the fact that the H tone associated with a monosyllabic stem spreads as more syllables are added. For instance, we have noted that the monosyllabic H spreads as diminutive and augmentative or femininity suffixes are added. In the case of some diminutive monosyllabic stems we have also noted that once reduplicated, a M tone could surface at the ends of P-domain. Before we analyze tonal alternations for disyllabics we need to define P-domains. But, firstly, we draw parallels between the disyllabic nominal stems and the monosyllabic nominal stems.

First, the FL tonal sequence in disyllabics is similar to the FL tonal sequence in seswáana, the FM to the FM tonal sequence in lehéháadī, the LH to the H in leehé, and the LL to the L in leeru. These are all examples of monosyllabic stems that have the same tonal pattern as the disyllabic stems in (49). Second, the syntactic contexts in which these disyllabic nouns are found are the same, word-finally or between the head noun and the qualificatives. Third, like the monosyllabic stems the forms in (50) and (51) are all non-derived. By comparison, we note that the FL in

seswáana (24b) becomes seswáná just as lerwáana becomes lerwáná, and lehéháadi (24c) becomes lehéhádi and as mosáadi becomes mosádi in certain syntactic contexts. In short, these disyllabic nouns show that the generalizations which we made for monosyllabics could be made for them as well. These are:

(a) H tones from particles spread and delink if, and only if, there is H tone syllable after the target.

(b) Lexical H tones do not spread into neighboring toneless lexical stems. (We will show that disyllabic lexical stems also behave like monosyllabic stems in this respect).

(c) Unlike monosyllabic stems, disyllabic stems have underived stems that surface with a M tone. Only inflected H-toned monosyllabic stems that are trisyllabic surface with a M tone. The syntactic contexts and phonetic environment, however, are the same for both.

(d) The H tones on inflected monosyllabic stems that have become disyllabic behave like the H tones on some underived disyllabic nouns in that they do not spread at the end of P-domains. In non-ends of P-domains as in (50) the H tones on these stems spread one mora to the right.

We therefore conclude that the argument advanced for the monosyllabic stems must hold for these forms as well. Since we did not explain the syntactic contexts in our discussion of the monosyllabic noun stems, we now present details about the distribution of these tonal patterns in a

Sesotho sentence. A reader who is not interested in the syntactic facts may simply skip this section and take our word for it.

3.0 Distribution of FL and FM in a Sesotho Sentence

We will show the different syntactic contexts in which a FL and a FM pattern surface instead of a HH and a HL pattern, respectively.

3.0.0 End of a One Word Sentence

One word sentences are the same as what traditional grammarians call elliptical sentences. They may be responses to questions where the one word is an object or something else as in (52), for instance.

52(a) Q. ó rátá-ng?

AGR like-what?

What does he like?

A. ó rátá selépe./ Selépe.

AGR like axe./ An axe.

He likes an axe./ An axe.

(b) Q. ó tsamáílé l!é eng?

With what has left?

AGR leave-PERF with what

A. ó tsamáílé l!é selépe./ Selépe.

AGR leave-PERF with axe./ An axe.

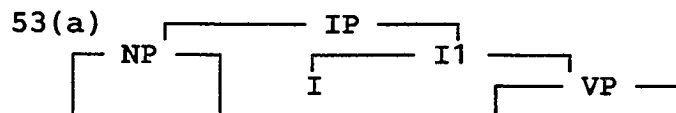
He has left with an axe./ An axe.

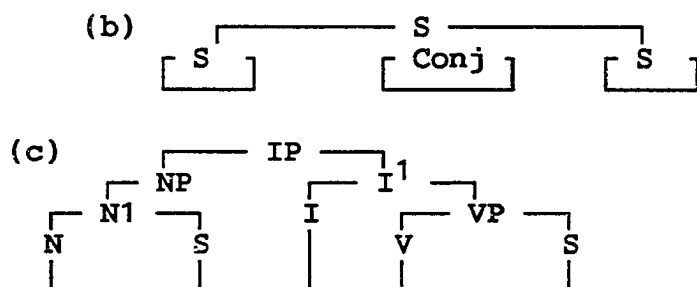
What (52) illustrates is that a word in isolation can be regarded the same as a word uttered as an elliptical response or as a word at the end of a sentence. Sentence-

final position, then, is an end of a P-domain. Therefore, if a noun is in isolation it will be treated as a word at the end of a P-domain in this study. Consequently, if it is a noun that has a lexical H tone on the first syllable, it will have a FL or a FM tonal pattern in this syntactic context, because the language has a choice between these two tonal cues. With some nouns it is the FL tonal cue that will signal the end of a P-domain. With some nouns, on the other hand, it will be the FM that will signal the end of the P-domain. Much depends on the noun's underlying structure.

3.0.1 Ends of Full Sentences

Besides the one-word sentences in 3.1, ends of full sentences are also ends of a P-domain in Sesotho. That is, ends of P-domain include all one-word sentences as well as sentence-final words on the right edge of any type of sentence. This means that the right edge of an x^{\max} is the end of a P-domain. Sesotho is characterised by at least three types of sentences as in (53) below. (53a) is a simple sentence that contains no other S (IP) node. (53b) is a compound sentence that contains two S (IP) nodes conjoined. Lastly, (53c) is an illustration of a complex sentence which contains two embedded S (IP) nodes, one embedded within each of the daughter nodes of the sentence.





The structures in (53) clearly show that the sentence-final position can be vague if not defined appropriately. It may mean any last word within at least one S node or the last word of the whole sentence. Ends of P-domain, therefore, are defined in this study as the last position on the right edge of a sentence, be it simple, compound or complex. That is, if a linear count of the words is made starting on the left edge, the last word on the right edge is the end of P-domain. Illustrations of words at the ends of P-domains are given in (54).

54(a) Thabo ó rătă p!óodi.

Thabo AGR like goat

Thabo likes a goat

(b) Thabo ó rătă p!ódí mmé !ó bătla bá jé yoná féelä

Thabo AGR like goat conj AGR want AGR eat it only

Thabo likes mutton and wants them to eat it only .

(c) Thabo ó bătla pódí hore ré tl!ó e hláabä.

Thabo AGR wants goat that AGR FUT it kill.

Thabo wants the goat so that we slaughter it.

(54a) is represented as (53a) structurally, (54b) as (53b) and (54c) as (53c). Póodi (54a) is at the end of P-domain. Pódí (54b) is not at the end of a P-domain. This

is so in spite of the fact that the sentence is a compound one and *pódí* is the last word of the first conjunct. The adverb *féelā* is at the end of a P-domain. *Pódí* (54c) is also not at the end of P-domain. The verb *hláabā* is at the end of the P-domain. We should here emphasize that *pódí* precedes a complementizer *hore* introducing the embedded sentence. So, the end of the P-domain is strictly the last word on the right edge of a sentence, be it simple, conjoined or complex.

At the ends of these P-domains there are disyllabic nouns such as *póodi* that are characterized by a FL tonal pattern. In addition, there are disyllabic nouns such as *mosáadi* that are characterised by a FM surface tone. These are the phonetic cues that signal these ends of a P-domain.

3.0.2 Between Head and Chomsky-adjoined Constituents.

We will argue that there are two types of syntactic contexts where a head is followed by a Chomsky-adjoined constituent. These are the syntactic context where the Case assigning quality of a Sesotho verb has been absorbed by a Case absorber *ya* and the syntactic context where a head noun is modified by what Doke calls a 'qualificative'. Since we know that languages have subtle phonetic cues to signal ends of prosodic domains, we use such phonetic cues to identify the ends of P-domain. The phonetic cues which we have identified thus far are a FL and a FM tonal patterns for Sesotho.

3.0.2.0 Verb and Chomsky-adjoined Constituent

In Chapter 1 we defined Chomsky-adjunction. A governor in Sesotho always selects the governee by assigning a theta role to it. If a constituent is not selected, it may be Chomsky-adjoined or may be C-commanded by the verbal head which can assign Case to it. A Chomsky-adjoined constituent is in a different P-phrase from the P-phrase for the head. A C-commanded constituent is within the same P-phrase as the head. A comparison of (55) with (56) captures this relation succinctly.

55 Thabo ó rá tá ho já batho.

Thabo AGR like to eat people

Thabo likes cheating people

Ho já batho (55) is an S[Infinitive] subcategorized for by the verb. We know that all governed constituents are tonally within the same P-domain as the head. The S[Infin] is therefore P-governed by the verb. This means that the S[Infin] is in the same P-domain as the verbal head rá tá. This is signalled by the spreading of the H tone of the lexical verb as demonstrated in rá tá (UR :rá ta).

If, however, the S[Infin] is not P-governed by the lexical verb, the verb would have a long penultimate vowel and a M tone would surface on the last syllable as in (56) below.

56 Thabo ó ya rá atā ho já batho

Thabo AGR CA stem INF stem people

Thabo likes to cheat people.

In (56) we have a verbal head *ráatā* which clearly does not govern the S[Infinitive] which follows it. The S[Infinitive] is therefore in a Chomsky-adjoined position. In Khoali (1990) we argue that the *ya* between the subject agreement marker and the verb stem is a useful syntactic diagnostic for identifying verbs that do not govern anything. If the verb marked with *ya* were to govern the constituent that follows the verb, the verb would have to assign Case to it. But, because the *ya* absorbs Case, the verb would be unable to assign Case. Hence, in a sentence such as (56) the verb does not assign Case to the S[Infinitive] and therefore the S[Infinitive] is Chomsky-adjoined to the VP. We will come back to this discussion in Chapter 4.

Besides the syntactic diagnostic, tone is a useful diagnostic to signal that the head does not P-govern the constituent that follows it. One cue which we have already identified is the FL tonal pattern. In addition to this tonal pattern there is the FM tonal pattern. Verbs which do not P-govern any constituent are all characterised by a FM tonal pattern. This means that a verb with a FM tonal is definitely at the end of a P-domain. That is, the verb in (56) is clearly at the end of a P-domain. Any constituent that may be following the verb such as the S[Infin] in (56) is therefore Chomsky-adjoined.

A comparison of the sentences in (57) will show that the inverted subject in (57b) is P-governed by the verb

bíná. This is so because the lexical H on the verb does not spread in (57a) as the verb **bíina** is at the end of P-domain. But, in (57b) the H on **bí** of **bína** spreads one to the right because **bíná** P-governs **póodi**.

57(a) Pódí e rátá ho bíina.

Goat AGR like INF sing

Goat likes to sing

(b) é rátá ho bíná póodi.

AGR like INF sing goat.

Goat like to sing.

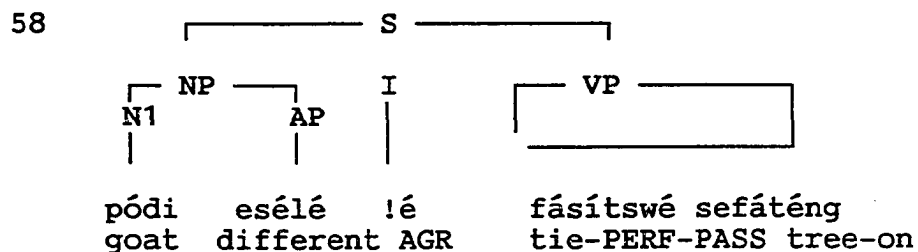
Pódí (57a) is pronounced as HH as it is within a P-domain and in (57b) **póodi** is FL at the end of P-domain. The verb **bíina** is pronounced as FL in (57a) because it is at the end of a P-domain. In (57b) the verb is pronounced as HH because it now P-governs the inverted subject **póodi**.

3.0.2.1 Nominal Head and 'Qualificatives'

The next syntactic context where the head is signalled by tone as being at the end of a P-domain is that between a nominal head and a constituent modifying it. Constituents that modify nominal heads are called 'qualificatives' by Doke (see Doke and Mofokeng 1957, Guma 1971). If any of the words which Doke calls a 'qualificative' follows a noun, the tonal pattern of the noun will either be FL or FM. These two tonal patterns have been established to be signals for constituents that are at the end of a P-domain. We will maintain this claim even in the case of these nominals.

This means that all postnominal words referred to as 'qualificatives' in Guma (1971) and Doke and Mofokeng (1957) are not governed by the nouns they qualify. All postnominal modifiers in Sesotho are therefore Chomsky-adjoined to the NP. As a result of this Chomsky-adjunction, several 'qualificatives' can be listed after the noun without any problem. The noun just does not select them. The 'qualificatives' are not required for the noun to make sense. Hence, since the 'qualificatives' are optional constituents, they are not governed.

According to Jackendoff, the phrase structures should capture the relation between the head and the complement or between the head and the adjunct (Jackendoff 1977). It is in his spirit that we believe that postnominal modifiers or 'qualificatives' are Chomsky-adjoined. These postnominal modifiers are, in other words, not sister to the nominal head as (58) illustrates.



In (58) the PtP node dominating the 'qualificative' *esélé* is Chomsky-adjoined to the NP. This implies that the right edge of a x^{head} which is C-commanded by a Chomsky-adjoined constituent is also the end of a P-domain. That is, once

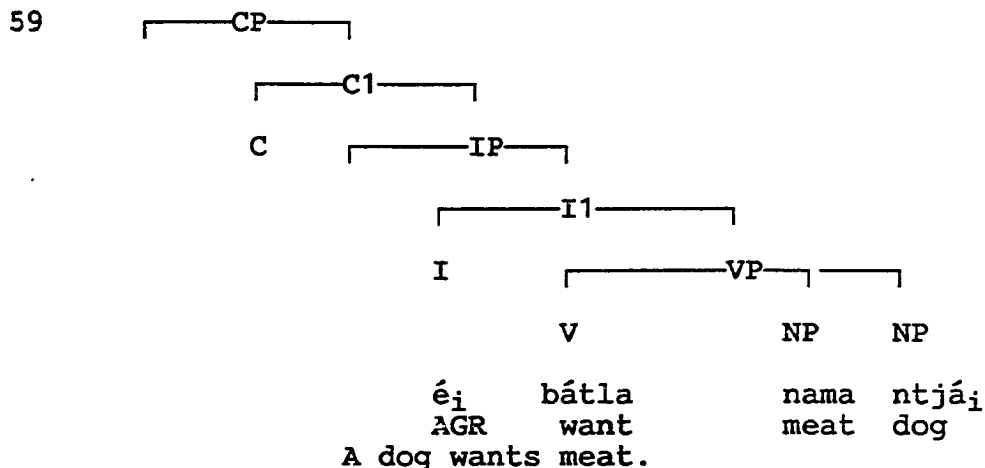
head is C-commanded by an adjunct, it is at the end of a P-domain in Sesotho.

3.1 Distribution of the HH and the HL in a Sesotho Sentence (Non-ends of P-Domains)

3.1.0 The NP Subject in a Sesotho Sentence

In most cases of predication, there is a participant that is predicated upon. This participant is generally called the argument. NPs are usually participants in most predications and therefore could be regarded as arguments in the predication. NPs could be external or internal arguments in a predication. The external argument is commonly referred to as the subject of the sentence and the internal argument as the object of the verb.

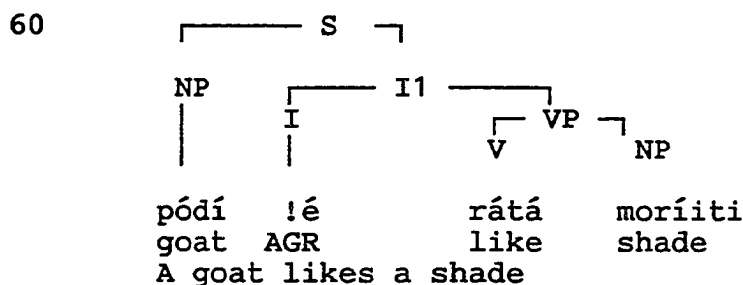
A language like Sesotho is generally regarded as a pro-drop language. What this means is that the subject of the sentence can be dropped or be inverted without any violation of the grammaticality of the sentence. The question is: what is the position of the inverted subject NP under the VP node? The inverted subject as in (57b) is base generated in the VP in this language. This means that the basic order is VOS rather than the commonly accepted SVO. In short, the basic structure for a Sesotho sentence, which has both what is called a subject and an object is as in (59) below.



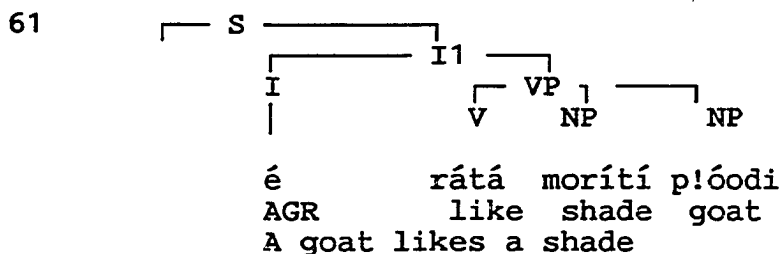
In (59) we are concerned with the NP dominating *ntjá*. Syntactic evidence and tone evidence corroborate the fact that this NP has to be generated within the VP. The NP subject gets its the theta role internally and then moves to the specifier (spec) of IP to get Case from the AGR. AGR (agreement) is co-indexed with the subject NP. It is only by co-indexation with AGR that the NP such as *ntjá* in (59) gets the same semantic interpretation as the AGR. We will show that VP internal NPs such as *ntjá* in (59) are P-governed while Chomsky-adjoined NPs are never P-governed. The notion of P-government simply means that the NP is within the same phonological phrase (P-phrase) as the next constituent. It follows that the inverted NP is within the same P-phrase as the object NP *nama* and the V *bātla*. It should suffice to say that tonological evidence has been used to establish the status of the inverted subjects in Chichewa (Bresnan and Kanerva 1990). Along the same lines as Bresnan and Kanerva (1990) we argue that the inverted

subject is a constituent of the VP on the grounds of the tone evidence.

In a nutshell, the first position that is not the end of a P-domain is the one between the specifier and the head of a maximal head. This means that the non-recursive side of an Xhead is within the P-domain. The non-recursive positions can be occupied by NPs and modifiers. That is, both NPs and modifiers can be specifiers. The structure in (60) shows an NP *pódí* as a specifier of IP (S).

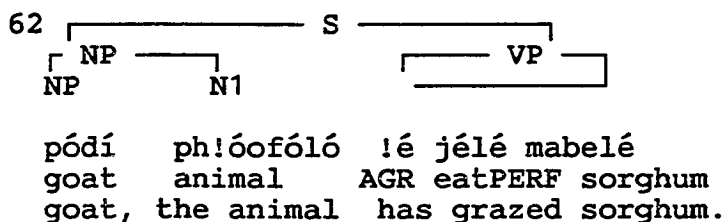


Compared to *pódí* in (60), however, *póodi* in (61) below is one of the constituents of the VP. This is so because the subject NP *pódí* is inverted and adjoined to the VP. Under the VP node the inverted NP linearly follows the object NP. The object NP no longer occupies the sentence-final position. Hence, the tonal pattern on *moríiti* (60) changes from FL to HH *morítí* (61).



Since the subject NP is sentence-final in (61), it has a FL tonal pattern. Also, in (61) attention has to be drawn to the fact the verb under the VP node is not sentence-final because it governs its NP sister. Hence, the FM tonal pattern is not possible here.

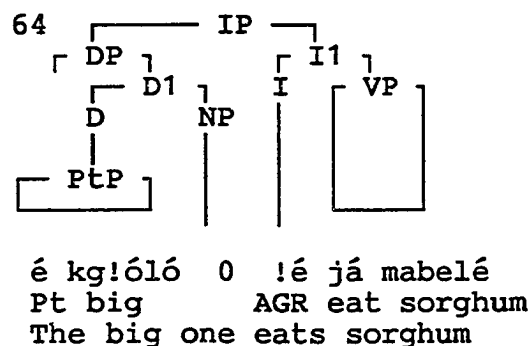
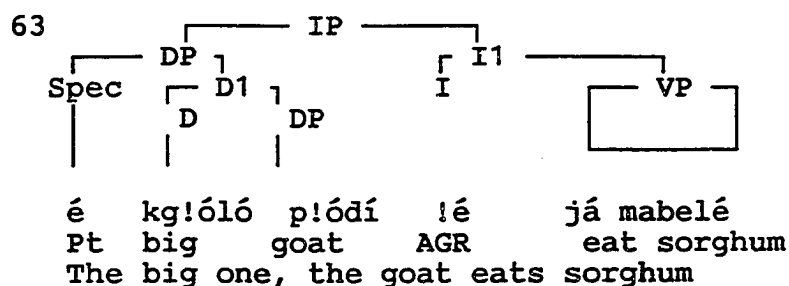
An NP can be a specifier of another NP as in (62). The two NPs are what the traditional grammarians would call nouns in apposition.



The first NP in (62) is not at the end of a P-domain. This obviously is inconsistent with our intuitions in reading Sesotho. In terms of our intuitions we may want to make a distinct break after the first NP. The HH tonal pattern on the first NP, the second NP, and the verb, simply tells us that the first NP P-governs the second NP and the latter NP P-governs the verb, which in turn P-governs the object NP. This is further evidence that the non-recursive side of the x^{head} is within the same P-phrase as the x^{head} .

3.1.1 Prenominal PtP in a NP

In (63) below the PtP is preposed. It precedes the qualified noun. As such, the PtP can remain as the only head of a DP projection. That is, the qualified noun can be left out without any change to the grammaticality of the sentence as in (64) below (63).

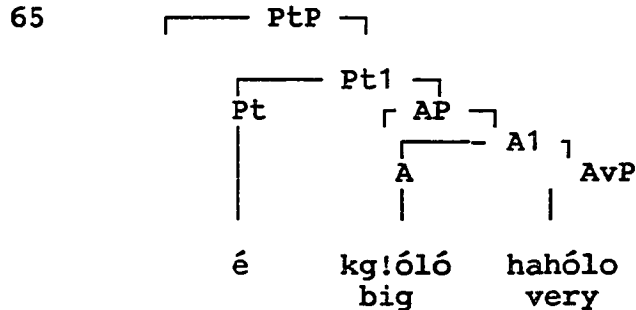


'Qualificatives' as in (63) and (64) act as heads of a DP projection. The heads select NPs or Adverbs. Sometimes they select nothing as is the case in (64). 'Qualificatives' in these syntactic contexts are within a P-domain. The H tone on them spreads one mora to the right and thereby signals that they P-govern the noun that follows them. If the noun is absent as in (64) the 'qualificative' P-governs the next constituent, namely the verb. Since the PtP in (63) is on the non-recursive side of the x^{head} , we expect it to P-govern the head.

3.1.2 Adjective/Relative as Head Selecting an Adverb

Another position which is clearly not an end of a P-domain is the one between the A and the adverb modifying it. The adverb can never be an adjunction within the phrase as in (65). Since in (65) the A theta assigns the AvP, the H on the A is expected to spread one to the right. There is

therefore no end of a P-domain between the A and what it subcategorizes for.



In (65) the adjectival nominal *kg!óló* P-governs the adverb *hahólo*. It is the spreading of the H tone of the adjectival nominal which leads us to this conclusion. However, we will argue in Chapter 4 that the adverb is never P-governed by a verbal head in Sesotho.

3.1.3 Topicalized NPs

Topicalized NPs as in (66) below are also not ends of P-domains as can be shown by the HH or HL tonal sequence.

66(a) Pódí motho ó e rékíle.

TOP person AGR OM buy[Petf]

A goat, a person has bought

(b) Mosádi motho ó mo hládile.

TOP person AGR OM divorced

Wife, a person has divorced

Pódí (66a) and *mosádi* (66b) P-govern the NP subject *motho*. (66a) is a HH while (66b) is a HL tonal type. Remember, the FL and the FM tonal patterns signal an end of a P-domain. Topicalized NPs are therefore not at the ends of P-domains.

This completes our exposition of the cases which are not ends of P-domain. Before we discuss the means whereby all the syntactic information which we have identified can be incorporated into our theory, we present lists of disyllabic nouns occurring in these positions. We give tentative underlying forms and correct phonetic forms. The tentative underlying forms will serve as a point of reference as we present proposals for analyzing the tonal patterns of Sesotho nouns. The first list (67) is for nouns that have the first syllable H-toned and the second syllable toneless. The second list (68) is for the same nouns where the second syllable has a H tone. The third list (69) is for nouns that have a HH underlying structure. The last list (70) is for nouns that are HH underlyingly, although they surface with a HL tonal sequence. We discuss all these proposals immediately after the lists. Underlying tones are outside the brackets. Phonetic forms are in square brackets.

67 OH0 [LHLL] [=LFL]

lenáala	'nail'	lengóole	'knee'
sebóono	'buttock'	moríiri	'hair'
pháatla	'forehead'	lehéetla	'shoulder'
leíihlo	'eye'	leléeme	'tongue'
leíino	'tooth'	sefúuba	'chest'
tlhóoko	'nipple'	lepháako	'stomach'

We have picked on body parts for convenience. The list can be much more longer than what we have in (67). Within a

P-domain the nouns in (67) are pronounced as HH as in (68) below.

68 OH0 [LHH]

lená lá	'nail'	lengó lé	'knee'
sebónó	'buttock'	morírí	'hair'
phátlá	'forehead'	lehétlá	'shoulder'
leíhló	'eye'	lelé mé	'tongue'
leínó	'tooth'	sefúbá	'chest'
tlhókó	'nipple'	lephákó	'empty stomach'
mohlá ré	'jaw'	mothápó	'vein'

(69) is a list of nouns that are characterised by a FM at the ends of P-domains.

69 OHH [LHLH] [=LFM]

hlóohö	'head'	letswéelë	'breast'
théepë	'vegetable'	kóomä	'penis'
búukä	'book'	mosáadi	'woman'
lehéemü	'bird'	seléei	'sledge'
sebóokü	'grass'	lekáakö	'shrew'

We should note that nouns in (69) are pronounced as FM in exactly the same environments as nouns in (67). Within P-domains where nouns in H0 (67) become HH (68), nouns in FM (69) become HL (70).

70	HH [HL]				
	hlóho	head	letswéle	breast	
	thépe	vegetable	kóma	penis	
	búka	book	mosádi	woman	
	lehému	bird	seléi	sledge	
	sebóku	grass	lekáko	shrew	

Nouns *basádi* (71a) and *letswéle* (71b) are within a P-domain as can be shown by their HL instead of FM tonal pattern.

71(a) *Basádi bá bíná p!ína.*

women AGR sing song

Women sing a song.

(b) *Letswéle lé á thothomela.*

breast AGR CA shake

The breast is shaking

A summary of the syntactic information necessary to capture where a FL or a FM tonal pattern is summarized as follows:

- (a) the last word of the right edge of a sentence when a linear count is made from left to right
- (b) all words in isolation or elliptical words
- (c) the head of a NP which does not govern other constituents adjoined to the NP i.e., a disyllabic head noun which does not subcategorize for modifiers that follow it

We have also noted that the following are not ends of P-domains. Hence, we find a HH or HL tonal pattern in these syntactic contexts.

- (a) If a linear count is made of words in a compound sentence from left to right, the last word of any conjunct preceding a conjunction is not at the end of a P-domain.
- (b) Any constituent to the left of the head of the projection such as prenominal 'qualificatives' or topicalized NPs is not the end of a P-domain.

Some disyllabic nouns are not affected by these syntactic contexts. Their tonal forms do not alternate with respect to P-domains. Examples of such disyllabic noun stems are in (72) below.

72 00H[LLH]

leootó	'foot'	mohlaamú	'rectum'
seqoomá	'hair'	motloonyá	'hair'
tseebé	'ear'	kgoomó	'cow'
kweekwé	'bird'	tshuumú	'white forehead'
molaamú	'stick'	seeetá	'shoe'

In our discussion of the monosyllabic noun stems, we observed that the lexical H tone can spread one mora to the right within the stem. That is, we argued that the lexical H tone of monosyllabic stems spreads one mora to right if the stem is extended by diminutive, augmentative, femininity

or reduplication. This is also true for the lexical H of these nouns as (73) illustrates.

73 00H00[LLHHLH] [=LLHFM]

leotónyáaná	small foot	mohlamúnyáaná	sm rectum
seqomáqóomä	redup hair	motlonyátlóonyä	hair
tsebényáaná	small ear	kgomónyáaná	small cow
kwekwéháadi	fem bird	tshumúnyáaná	wh spot
molamúnyáaná	sm. stick	seetányáaná	sm shoe

We note here that the lexical H on these nouns only spreads within the stem. It does not spread if the stem is followed by another stem even if that stem is toneless. (74) shows unacceptable pronunciations.

74(a)*Ke rékéla maotó ménwana.

I buy toes for the legs.

(b)*Ke batlela molamú sélata.

I want a stick-protector for the stick.

We will demonstrate in 4.0 that the nouns in (74) are ungrammatical because their prefixes are H-toned. We will show that these prefixes can be targetted for a H spreading. But, only H tones on clitics can target toneless class prefixes. However, if a lexical H tone within the stem is adjacent to a toneless mora whether or not the mora belongs to another stem, there will be spreading. In short, within compound stems, for instance, there may be cases of spreading from one lexical item to the other. That is, spreading takes place only if the next lexical item is reanalysed as an inseparable part of the stem.

The last forms involve disyllabic noun stems whose syllables are all underlyingly toneless. Examples of these nouns are in (75) below.

75 000[LLL]

tlhaafu	leg	monwaana	finger/toe
lereete	testicle	seroope	thigh
qhoolo	hip	seseete	testis pouch
seleedu	chin	moloomo	mouth
molaala	neck	seaatla	hand
sephaaka	arm	kgoopo	rib

The class prefixes of these nouns are sometimes pronounced with a H tone as in (76). This happens when they are preceded by a H-toned clitic. The surface tones become [HLL] instead of the expected [LLL] in this context.

- 76(a) ke na lé mólala I have a neck
 AGR have Pt neck
- (b) ke tsamaya sá máotó I travel like feet
 AGR walk Pt chief

(76) shows that the prefixes of some nouns can get a H tone if they are preceded by some H tones. These prefixes, however, do not get a H tone if followed by a lexical H tone as is demonstrated in (77).

- 77(a) Ke na lé moríiri I have hair
 AGR have Pt hair
- (b) Ke na lé letswéelē I have a breast
 AGR have Pt breast

(c) Ke tsamaya sá lekáaü I walk like a goose
 AGR walk Pt goose

To summarize, there are nouns that are pronounced as FL or FM at the end of P-domains and as HH or HL respectively within P-domains. The same nouns FL or FM are pronounced as HH or HL respectively if affixes are added on their roots. There are also OH and OO stems which are pronounced as LH and LL respectively in all contexts. The class prefixes of both a OH and OO noun can be pronounced with a H tone if preceded by a H-toned clitic. The H tone on these clitics, however, do not spread into the stem even if the stem is toneless. H tones on final syllables of noun stems can spread one to the right within the stem, but never across stem or word boundaries. What do these observations tell about the tonal grammar of Sesotho?

4 Assimilation and Dissimilation in Underived Disyllabic Nominals

In this section we give an account of the tonal alternations. We will be at an advantage at this point because we have identified the syntactic contexts where tonal modifications occur.

4.0 OH0[LHLL]/[LHL]

Our discussion of the monosyllabic verb in section (2) above showed that the H of a H-toned monosyllabic noun stem surfaces on the next TBU as soon as toneless affixes are added. We demonstrated that the affixes are toneless. Our exposition of the disyllabic noun stems in (3.0) above, on

the other hand, showed that it is not only when affixes are added that a lexical H on a stem surfaces on the next available TBU. In certain identifiable syntactic contexts, the H on the first syllable of a bisyllabic noun stem can surface on the next available TBU even if no affixes are added. On the basis of the presence of the H tone on the first syllable of all disyllabic stems of this type in all contexts, we have reason to conclude that at least the H tone on the first syllable is underlying. That is, *pó* of *póodi* (78a), of *pódí* (78b), and of *pódínyana* (78b) is always pronounced with a H in all three environments. Where there seems to be a deviation from this pattern is where *pó* of *pódí* (79) is preceded by a H tone on a preceding word. The H on *pó* of *pódí* in this case is a downstepped H.

78(a) Ke batla *póodi*.

AGR want goat

I want a goat

(b) *Pódí !é bátla jwang'*.

Goat AGR want grass

A goat wants grass.

(c) *Pódínyana* ' a small goat'

goat-dim

In (78) the tone of the first syllable is always a H tone. This tone seems to be the one characterizing the lexical item *póodi*. Should there be any change to this H tone, the item would cease to be identifiable as an item for 'goat'. The H tone on the first syllable is therefore contrastive.

Hence, this H tone is in the underlying structure. In (79) below, however, the H tone on the first syllable can be predicted to be downstepped if it is preceded by a H tone on another word.

79 Ke rátá p!óodi.

AGR like goat

I like a goat

Since we can predict the downstepped H in (79), we exclude it from possible underlying tones of the noun. The first syllable is indeed underlyingly H-toned. The first syllable in p!óodi (79) is, in fact, a downstepped F(alling) tone in the sense that the first mora of the penult is H-toned while second mora is L-toned. A combination of these two (H and L) create a F contour tone on the syllable. So, the F tone is also predictable. What about the second syllable?

In the case of the second syllable, the situation is complex. Firstly, the syllable surfaces with a L tone at the ends of P-domains. We discussed these P-domains in the preceding paragraphs. Secondly, the same syllable surfaces as a H tone within P-domains. That is, if the noun is not qualified by 'qualificatives' or if it is not at the right end of a sentence, the syllable surfaces with a H tone. Since both the H that surfaces within P-domains and the L that surfaces at the ends of P-domains are predictable, we assume that they are both merely surface tones. In fact, we stated in the Chapter 1 that Sesotho evidence suggests that only H tones exist in the underlying structure. We defended

the view that only H tones exist in the underlying structure by showing how the other tones could be explained in relation to the underlying H tones.

The second H tone in *pódí* (78b) is only possible if there is a H tone on the first syllable. There is therefore reason to believe that the second H tone is a consequence of assimilation. The L tone is a surface manifestation of the application of default rules, namely that any TBU without a tone is assigned with a L tone on the surface. We also argued for this view in our discussion of the monosyllabic stems. The second H is a consequence of assimilation and the L is a consequence of the application of default rules. If the second H tone is a product of an assimilatory process, it means that the H linked to the only mora of the first syllable spreads one mora to the right within P-domains. However, at the ends of P-domains, spreading has to be blocked from applying because ungrammatical forms would be generated.

In our discussion of monosyllabic stems we formalized the rule for spreading as Rule (25). We repeat it here as Rule (80).

$$80 \quad \begin{array}{c} H \\ | \backslash \\ e \quad e \end{array}$$

Rule (80) generates correct patterns for all cases of spreading which occur when affixes are added to the ROOTS. In short, it generates correct results for examples such as *pódíyana* (78c). The rule also generates correct results

for examples such as *pódí* (78b). The spreading in *pódí* (78b) is no different from the spreading in *pódinyana*.

However, the rule also generates unacceptable pronunciations if it applies to a noun at the end of P-domain as in (78a).

We could fix the rule by restricting its application to the lexicon. Accepting the spreading of a H tone to be a lexical process, however, does not solve all of our problems. First, it does not solve the problem of the L tone that surfaces on the last syllable in *póodi* (78a). Second, it does not solve the problem of the spreading of a H tone from the H-toned clitics to the next available toneless clitic. We will address the latter problem towards the end of this section of our discussion.

Besides the analysis that L tones are gotten by default rules as proposed in our discussion of monosyllabic nouns, there are several ways of solving the problem of the L tone in (78a). One such way would be to assume that the underlying tones are not privative but binary. That is, if we assume that tones are either +H or -H in Sesotho or H versus L tone, the L tone could be regarded as underlying. So, *pódí* (78b) would be a case where the L tone on the second syllable would have to delink.

Having delinked the L tone, a H tone would then spread one mora to the right in all non-ends of a P-domain. At the ends of P-domains, the floating L tone would just link since there would be a free mora. By some stipulation one would have to rule out linking of two tones to a single mora so

that linking of a L tone at the ends of P-domains would be an explanation for why the H tone does not apply. Without such a stipulation, there is nothing in the theory that could prevent the H tone on the first syllable from spreading one to the right by Rule (80). No association lines can be crossed by linking a tone to a TBU which is linked to another tone as can be shown by (81) below.

81 H L
 | \ +
 @ @

Between the last syllable of *pódí* (78b) and the word boundary, there would be a floating L tone. Such a floating L tone would also have to be shown to be present. One common signal of floating L tones in most languages is the Downstepping effect which they have on H tones adjacent to them (Clements and Goldsmith 1980, Clements and Ford 1977, Pulleyblank 1986). In Sesotho there is no evidence of any such downstepping of H tones in examples such as *pódí* (78b).

If the L tone is not delinked, however, the argument about no downstepping effect on H tones would be irrelevant. The signal for the presence of a linked L would be a F tone on the last syllable. This would mean that the second syllable of the noun *pódí* (78b) is a contour tone. There are contour tones in Sesotho, but they are found only on long syllables. For instance, there is a F tone on the penult of *póodi* (78a). The last syllable of *pódí* (78b) is not an F tone. So, the last syllable of *pódí* (78b) is not

linked to any tone underlyingly. The last syllable in póodi (78a) is toneless and therefore is a potential target for the spreading and insertion of tones. Hence, in terms of the spreading Rule (80) above, the second syllable should be H-toned. However, we know that speakers say póodi instead of the predicted pódí in this environment. So, the rule generates ungrammatical utterances.

Fixing Rule (80) cannot be achieved without taking into consideration the syntactic contexts where spreading has to be prevented from applying. There are several ways in which Rule (80) can be blocked from applying. One way would be to encode all the syntactic contexts in which spreading does not take place into the statement of our rules. For instance, we could exclude the application of the spreading rule if, and only if, the noun is qualified by 'qualificatives' as well as if the noun is at the right edge of a sentence. The six 'qualificatives' (demonstrative, enumerative, quantitative, adjective, relative and possessive) would have to be listed in the rule. So, our spreading could be formulated as in (82) below.

82 H
 | \
 @ @ @ (Condition: 3rd TBU not on Q)

We rejected a similar rule in our discussion of the monosyllabic stems on the grounds that the rule violates Locality Condition (Myers 1987, Archangeli and Pulleyblank 1986). Taking this to be word-processing, it means the

human parser is expected to scan the string from left to right counting TBUs on the way until it reaches the third TBU. Once the human parser reaches the third TBU, it is expected to go back to instruct the H tone to spread. Such rules are highly discouraged in phonology (Cole 1987). Besides, there does not seem to be any natural phonetic material among all 'qualificatives' which could be argued to be responsible for blocking the application of H tone spreading. The examples involving verbs will further show that there is no way a phonetic environment conditioning this lack of spreading can be gotten. Chomsky-adjoined constituents as well as constituents that are not Case-marked by the verb would also have to be added in the condition for the rule.

The strategy of allowing phonological rules to have free access to syntactic information is adopted by several linguists (Odden 1987, Kaisse 1985). The complexity of the syntactic information needed for such an approach in the analysis of Sesotho cannot be overemphasized. However, it is clear that on the grounds of simplicity and naturalness such rules as (82) are undesirable. This takes us to a discussion of another approach to the problem, namely, an indirect reference approach recommended in Selkirk (1984), (1986), and in Nespor and Vogel (1986).

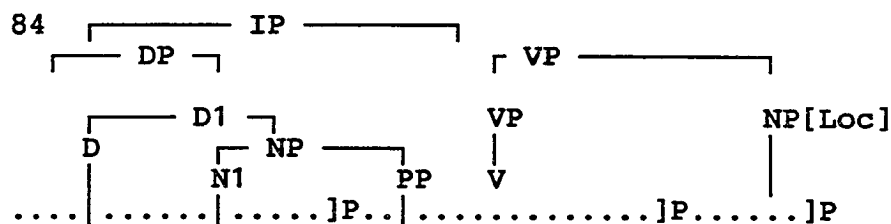
In Chapter 1 we introduced the theory of Prosodic Hierarchy proposed by those who believe that the S-structure string is mapped into a prosodic structure by rules that

have direct access to syntax. It is the prosodic structure which becomes the input to the phonology. In other words, phonological rules make reference to prosodic domains that are created by making use of limited syntactic information such as heads of maximal projection, maximal projection, C-command relations, and so forth.

Nespor and Vogel have devised algorithms for mapping the surface sentential structure to prosodic structure (Nespor and Vogel 1986). On the basis of the syntactic contexts where FL or FM are found, we have reason to believe that in Sesotho the construction of P-phrases involves identification of heads of maximal projections, establishing whether such heads are C-commanded on the right by Chomsky-adjoined constituents or not. Hence, we tentatively propose Rule (83) below as the rule that constructs the relevant P-phrases in Sesotho.

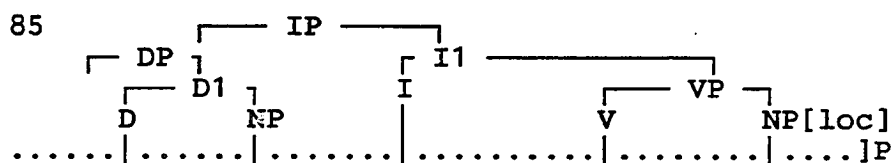
83 Insert phonological boundaries at the right edge of all heads followed by Chomsky-adjoined constituents. Otherwise insert the boundary at the extreme right edge of an x^{\max} .

In terms of Rule (83) the syntactic string is scanned from left to right, identifying heads which are C-commanded by adjuncts until the extreme right bracket of the x^{\max} is reached. At the right edge of such bracket, the last phonological boundary is inserted. In (84) below we demonstrate how this rule applies in the language.



pódí, phóofóolo yák!á !é ya ráatä moreneng
 goat, animal of mine AGR CA like the Great Place
 The goat, my animal likes the Great Place

Comparing (84) with (85) below, we observe that in (84) there are several P-phrases while (85), on the other hand, has only one P-phrase as there are no 'qualificatives' postnominally and the verb is governing the locative NP.



Pódí phóofóló !é ráatä moreneng
 goat the animal likes the Great Place.

Our assumption is that every utterance in Sesotho has to be processed by Rule (83) before the application of phonological rules.

The phonological phrases created by Rule (83) do not necessarily coincide with x^{\max} as is the case with Xiamen or Ewe (see Chen 1987, Clements 1978). In Sesotho, therefore, the choice of end-settings for derived domains is made on the basis of the fact that the recursive side of the head of a x^{\max} consists of an adjoined constituent or not as in the case of a word in the right end of sentence (Selkirk 1986, Chen 1990, 1987).

In light of this theory we propose to solve the problem of the H tone spreading rule by assuming that the last syllable of a H-toned bisyllabic word is extratonal at the end of P-domains. The proposal that the last syllable is extratonal is based on tendencies in languages. Edges of words or sentences tend to be blind to rules that are metrically conditioned in many languages (Hayes 1982, Prince 1983, Myers 1987). We have not shown that there is need for extrametrical sensitive rules in Sesotho. We will, however, argue in Chapter 3 that the Sesotho tonal system cannot be adequately described without constructing some metrical structure to which rules will respond. This will be clear particularly in the analysis of verbs. On the basis of the nominal data, we will argue that what we have is a situation where the last syllable is extratonal rather than extrametrical. This means the last syllable is invisible to tone rules.

The spreading rule (80) spreads a H tone one mora to the right and no more. This means that the rule should affect bisyllabic nouns in a crucial way. Hence, if we make all last syllables of noun stems that consist of more than two syllables extratonal, we would be proposing rules that could never be verified on the basis of Sesotho data. In other words, for stems that consist of more than two syllables, there is no way we can demonstrate that the last syllable is extratonal since the last syllable is outside the reach of the spreading process. There is evidence for

extratonicity only in disyllabic noun stems in Sesotho. In addition, no other tones spread in Sesotho as the underlying structure only has H tones. There is therefore no reason to assume that final syllables of toneless disyllabic stems should be extratonic. Hence, we need to restrict extratonicity rule to H-toned disyllabic stems rather than to allow it to generate structures that will never be found in Sesotho. We mention these to exclude arguments that this type of extratonicity radically differs from extrametricality proposed as a general tendency in the languages of the world.

In our analysis there are parameters whereby languages may differ with respect to extraprosodicity. Rules that affect peripheral syllables make the parameters. For instance, if a language does not have rules that involve edges, there will never be any need for extraprosodicity of edges. If all constituents in any language need to be assigned a metrical structure and there are rules that are invisible to edges, all constituents would have to be marked for extrametricality. However, if in a language some constituents do not need a metrical structure for the correct pronunciations to be generated, extraprosodicity would be irrelevant to such constituents because there would be no rules to utilise the structure.

It is against this background that we propose the extratonicity rule that excludes any utterances that do not have a H on the penult underlyingly. Words in Sesotho

consist of syllables of two type; H-toned ones and toneless ones. The rules affect H tones. H Tone Spreading is just one mora to the right and is not iterative. There is therefore no way that any more syllables beyond the first two can be involved. We therefore have to restrict extratonicity to the last two syllables on the right edge of every word. All words that have the penult syllable H-toned underlyingly must have their ultima syllables extratonic. If the ultima is underlying H-toned, it means that it would not be affected by this extratonicity. The rule is formalized as (86) below.

86 Mark the ultima extratonic if the penult is
lexically H-toned at the end of a P-phrase
(or formally as)

@—————> < >/ H —]P

Rule (86) simply prevents the lexical H of H-toned disyllabic noun stems from spreading if they are at the end of a P-phrase. So, the extratonicity rule just makes reference to the end of a P-phrase.

Extratonicity of the last syllable at the end of P-domains does not solve all problems pertaining to HTS rule (80). According to the data on monosyllabic nouns and these disyllabic nouns, it is clear that Rule (80) must be barred from applying postlexically because it will generate unacceptable pronunciations as (87) below.

87(a) *Ke fá kgomó séatla I give a cow a hand
 AGR give cow hand

(b) *Ke fá mólomú mafúra. I give mouth fat

AGR give mouth fat

The H tone on mó of kgomó (87a) and of fá (87b) cannot spread to the class prefix of the toneless class prefix se of seatla (87a) and mo of molomo (87b) respectively, even though the stem is toneless. On the basis of these examples, we argued that H Tone Spreading is a lexical rule. This has to be the case because we know that if we add some affixes to the stems, H tone spreading takes place. In other words, it does not mean that the lexical H tones as in kgomó (87a) and molamú (87b) cannot spread. They do spread one to the right if affixes are attached to them as in (88) below.

88(a) Ke fa kgomónyána seatla.

AGr give cow-DIM hand

I give a small cow a hand

(b) Ke fá molamúnyána mafúura

AGR give stick-DIM fat

I give a small stick fat

We know that the diminutive suffixes are toneless: that they surface with a H tone when adjacent to the H tones on these nouns shows that H tone spreading has taken place. According to Rule (80), spreading should take place everywhere a H tone is followed by a toneless TBU. It is only at the end of P-domain where such spreading is excluded from taking place. But, since we know it does not take place when the toneless TBUs are on separate words, there is

reason to restrict this rule to the lexicon. After introducing the concept of the phonological word, we will show how the rule could be fixed to account for the facts without generating ungrammatical pronunciations as in (86). We argue that Rule (80) (HTS) occurs only in the W-domain. This restriction would limit the application of the spreading rule to the lexical level. In other words, once words are on terminal nodes of an S-Structure, we would not expect them to undergo any further spreading. This proposal, however, also prevents H tones on particles from applying postlexically. We still have a problem. We will therefore deal with this paradox.

Having established that the last syllable of a noun with a H-toned penult is extratonal at the end of P-domains, the question is: are there other rules that will make reference to these P-domains? The answer is YES. It is also at the end of these P-domains that Lengthening occurs. We mention this rule because it is crucially ordered with respect to the Extratonicity Rule. This rule will explain why in *póodi* (78a) the penult syllable is a F tone.

Our view is that the F tone is a consequence of the interaction of a Lengthening rule that adds a mora on the penultimate syllable when the noun is at the ends of P-domains. This Lengthening of the penult is what Doke describes as stress (see Doke 1935). Lengthening takes place at the end of a P-domain and nowhere else. According to Doke, stress is characteristic of all Bantu words. It

has nothing to do with P-domains. We can state the rule as in (89).

89 0 — >@/@ — \$]P

(The \$ is for a syllable). Rule (89) simply avers that a mora is inserted on the penult if, and only if, it is at the right end of a P-phrase. The rule is general. It adds a mora on the penultimate syllable of all constituents that are at the end of P-phrase. So, all constituents that are at the end of a P-phrase have a long vowel by Rule (89). Rule (89) is crucially ordered after HTS. Otherwise, the extra mora on the penultimate syllable might acquire a H tone from the first mora of the penult. The added mora will then acquire a L tone by yet another Rule, namely, the Default Rule. This means that the penult syllable will consist of a HL sequence. This HL sequence on one syllable is what is perceived as a F tone phonetically. Rule (89) should also be ordered before default rules because any extra mora which can be added after default rules would reach the surface without a tone. Since we know that in Sesotho all moras have tones on the surface, it would mean that unacceptable pronunciations would be gotten by allowing toneless moras on the surface.

The last rule applicable to a FL/HH alternation is therefore the rule that simply assigns toneless syllables such as the extratonal one with Ls. This rule is common in many analyses of languages similar to Sesotho especially if the tonal features are radically underspecified (see Myers

1987, Kisseberth 1990, McHugh 1990, Pulleyblank 1986, etc.)

We formalize this rule as Rule (90) below:

$$90 \quad @ \text{ ——— } > @ \\ \quad \quad \quad \quad \quad \quad \quad | \\ \quad \quad \quad \quad \quad \quad \quad L$$

Rule (90) is a default rule that simply inserts L tones on all toneless TBUs before they reach the surface phonetic structure. Application of Rule (90) gives the desired HL sequence on the penult syllable. It is the HL sequence that is realised as a F tone on the penult. If the M tone were contrastive, we would have expected the M tone to be the default tone. We would expect that, if we were to believe in Pulleyblank's claims concerning a three way contrast of a H, a L, and a M tone. Pulleyblank argues that in such cases the M tone is the default tone (Pulleyblank 1986). On the basis of the Sesotho data, however, Pulleyblank's claim cannot be verified because the M tones are clearly non-contrastive. M tones will be shown to be derived by non-default rules. This completes our analysis of the FL/HH alternations.

We noted in p!óodi (79) that the H tone can be downstepped. So before we discuss disyllabic noun stems with a FM/HL type, let us discuss the downstepping process in p!óodi (91) below.

91(a) ke rátá p!óodi

AGR like goat

(b) Ke batla ngwaná p!óodi

AGR want child goat

I demand the goat from the child

We established that the first syllable of p!óodi is underlyingly H-toned. If this H tone is preceded by another H tone, however, the H tone is downstepped as in Ke rátá p!óodi (91a). The H tone on the verb rátá is adjacent to the H tone on the first syllable of p!óodi. Rátá and p!óodi are independent thematic constituents that are within the same P-phrase. They are both C-commanded by I, the head of IP. So, the relationship between rátá and p!óodi is that rátá P-governs p!óodi although each is lexically independent. The same is true for ngwaná and p!óodi (91b) where the H tone on p!óodi is downstepped because the last syllable of the preceding noun, ngwaná, is H-toned. Ngwaná P-governs p!óodi in (91b). The nouns are in the same phonological phrase. That is, Downstepping signals that the two independent H-toned lexical items are adjacent within a P-domain. Downstepping of H tones is therefore a repair strategy to rectify violations of the OCP within the P-domain. Hence, Downstepping is a domain span rule. We formalize the rule in (92) below.

$$92 \quad H \text{ ————— } >!H/ [[[..H]w]C [[-..]w]C]P$$

What rule (92) does is to identify any two adjacent H tones on separate words within a P-domain. We stated the parameters for violations of the OCP in Chapter 1. One of them states that two H tones linked to adjacent syllables

are offensive in Sesotho. That the environment for the application of Rule (92) involves two linked adjacent H tones, suggests that Downstepping is a response to violations of the OCP. In other words, when two H tones on separate words are adjacent, they violate the OCP. Hence, offensive structures of this nature are repaired by downstepping the second H tone. Downstepping of the H tones as a repair strategy for violations of the OCP occurs only within a P-phrase. This process is further evidence that P-domains are justified in Sesotho. We will not discuss Downstepping any further at this point. As more data are introduced later in this Chapter, we will elaborate on it.

There are other issues emanating from the Downstepping process that need explanation. The environment makes use of W-domains [H]w and C-domains [[H]]C. The status of these domains has not been fully explained. We know that our Downstepping rule makes use of them. But, we do not yet know whether there are any other processes that make use of W-domains and C-domains. We can only know by expanding our data. We will show in (4.1) below that the W-domains are motivated in Sesotho. The C-domains will be clearer in our discussion of the verbal complex in Chapter 4.

4.1 OHH [LHLM] / [LHL] mosáadi / mosádi

In (4.0) above, we established the syntactic contexts in which some disyllabic nouns are pronounced as either FL or FM. We called them ends of P-domains. We also established that these nouns are pronounced as HH and HL respectively if

they are within P-domains. We argued that the FL/HH are H0 underlyingly. We now have to establish the underlying structure of the nouns that are FM/HL on the surface.

Let us begin by giving examples of syntactic contexts where these surface tone patterns are found. (93a) shows the noun *mosáadí* at the end of the P-domain. (93b) is an example of the noun *mosádi* within a P-domain and (93c) an example for the noun *mosádi* when its ROOT is extended by an affix.

- 93(a) *Ke batla mosáadí* I want a woman
 AGR want woman
- (b) *Mosádi ó bátla nama* Woman wants meat
 Woman AGR want meat
- (c) *Mosádinyana* Little woman
 woman-dim

We know that the class prefixes are toneless. We established this in our discussion of the morphemes that make a noun. Examples in (93) also confirm this because the class prefix is L-toned in all examples. The first syllable of the noun stem is H-toned in all examples in (93) suggesting that it is a tone that characterizes the noun. If we were to substitute this H tone for another tone, the meaning of the noun would be destroyed. We therefore conclude that the H tone on the first syllable of this noun is contrastive. Hence, we also conclude that the H tone on the first syllable is underlying.

We know that the underlying representation for the FL/HH is /H0/. That is, their first syllable has a H tone and the second syllable has no tone. We also know that the FM pattern correlates with the FL and the HH with the HL. In addition, we know that both the FL/HH type and the FM/HL are nouns whose first syllable are H-toned. So nouns with a FM/HL tone pattern phonetically cannot be /H0/ underlyingly, because that is the underlying tone for the FL/HH type. Without assuming that their underlying representations are different, there is no way there could be a difference between the FL/HH and the FM/HL nouns. We also know that they cannot be /0H/ or /00/, because we have nouns that are underlyingly /0H/ and /00/ respectively. So what could be the underlying tone on the second syllable of these FM/HL type of nouns?

The first logical conclusion seems to be that perhaps the M tone that surfaces on the second syllable is underlying. But, as was discussed in our discussion of monosyllabic nouns, the M tone is predictable. The M tone is found in all situations where the preceding syllable has a F tone. In addition, the M tone always surfaces on the last syllable. So, the M tone is not part of the underlying structure for these nouns. To assume that the M tone is underlying therefore leads us down a dead-end street. What is the underlying tone of the second syllable? Since the evidence that the FL/HH was decisively supportive of the proposal that the underlying for the FL/HH surface forms is

/H0/, it might be that the underlying representations for the FM/HL is a multiply-linked H tone as in (94) below.

94 0 H
 / \
 mosáǎí

If we assume that the underlying structure for the FM/HL surface forms is a structure such as the one in (94), we have to argue that the right branch delinks within P-domains, because the last syllable of the nouns surfaces with a L tone as in (95) below.

H
 | \
 95 Mosáǎi ó bátla nama
 woman AGR want meat
 Woman wants meat

At the ends of P-domains, we would have to assume that the multiply-linked right branch of the H tone surfaces as a M tone. But, it is not obvious how the structure is responsible for changing a H tone to a M tone. Perhaps by a wierd stipulation one could say that all multiply-linked H tone surface as a M tone in Sesotho. The proposal is obviously not attractive. Perhaps a more attractive proposal could be that a L tone is inserted on the last syllable as in (96) below.

96 H L
 / \ |
 mosáǎí

This L tone could be inserted at the ends of P-domains. In other words, ends of P-domains would be assumed to have a floating L tone underlyingly. This floating L tone would

not be inserted on the penult because there would be crossing of association lines. Floating L tones of this kind have been proposed in other languages such as Tiv, and even in Sesotho (Pulleyblank 1986, Kisseberth 1990). However, in other languages such floating L tones are demonstrated to be responsible for other processes such as Downstepping. For instance, in Tiv floating L tones trigger Downstepping (Pulleyblank 1986). Downstepping occurs in Sesotho within P-domains and crucially not at the ends of P-domains where such floating tones would be. Example (97) below illustrates this.

97 Kgoomó é kg!óló !é bátla meetsí.

cow Pt big AGR want water

A big cow wants water.

(97) above shows that between the head noun *kgoomó* and the adjective *é kg!óló* there is no Downstepping whereas, at the same time, between the particle *é* and the adjective *kgóló* there is Downstepping. We are reminded here of the fact that between the head noun and the adjective is the end of a P-domain. One would have expected the proposed floating L tones to be the causers of the Downstepping of the H tone of the particle *é*. On the contrary, at the point where we least expect Downstepping to take place, if it is the result of a floating L, Downstepping occurs: that is, between the head of a Particle Phrase (Adjective Phrase) and the selected adjective.

Besides, the idea of having floating L tones in the underlying structure simply contradicts our argument that there are no unpredictable L tones in Sesotho. In our argument all L tones are a product of default rules which cannot be allowed to apply at this point of the derivation. For instance, if default rules were to apply at this point, there would be no way that we could account for the F tone on the penultimate syllables of these nouns. These observations make us doubt the proposal that the L tones are floating at the ends of P-domains. So, where are we going to get the L tones to effect a change to the multiply-linked H tone?

Perhaps the L tone can be gotten by allowing the rule that inserts an extra mora on the penult to be crucially ordered with respect to the default rules. In other words, within the multiply-linked structure as in (94) above, there would be a mora that is not linked to any tone. This mora is a product of the Lengthening Rule which we proposed earlier. When default rules apply, the mora is inside the multiply-linked H tone as in (98) below.

98 0H
 / \
 mosáadí

The penult is a bimoraic syllable in (98). The first mora of the syllable is linked to a H tone and the second mora is toneless. When the L tones are inserted by default rules, the class prefix gets a L tone. The second mora on the

penult also gets a L tone. But, if the second mora associates with a L tone, association lines will be crossed.

So we cannot allow the second mora to associate with the default L tone. The analysis is therefore flawed unless one decides to use brute force as does Khumalo in the analysis of a similar problem in Isizulu (Khumalo 1987). Khumalo proposes that the L tone is inserted within the structure despite the crossing of association lines (Khumalo 1987). We are reluctant to use brute force in the sense that there are other alternatives that could explain the phenomenon without brute force.

First we reject the proposal that the H tone on these nouns is a multiply-linked H tone, because our discussion of the monosyllabic nouns that are extended by affixes has shown that the final syllable of a noun that surfaces as a M tone, is an independent H tone. The H that eventually surfaces as a M tone is not a result of H spreading. This evidence can further be supported by the evidence based on verbs. For instance, in the infinitive, disyllabic and trisyllabic H-toned verbal forms are pronounced as in (99).

99(a) ho ráata to like

(b) ho rátiisä to cause to like

In ráata (99a) the last syllable is L-toned. The penult is H on the first mora and L on the second mora. So the penult is a F tone. In rátiisä (99b) the penult has a H tone on the first mora and a L tone on the second mora. The last syllable has a M tone. If we assume the correctness of the

FL/HH nouns in (4.1), we have to assume that in *ráata* (99a) the last syllable is extratonal and therefore the H tone cannot spread to it. In *rátíisã* (99b), however, we assume that extratonicity is inapplicable because the stem consists of more than two syllables. Recall that extratonicity is relevant to H-toned disyllabic stems because lexical H tone spreading is just one mora to the right. It involves two syllables only. Hence, once the verb P-governs another constituent as in (100a) and (100b), the verbs *rátá* and *rátíisa* respectively have each a H-toned second syllable.

100(a) ho *rátá* nama

INF like meat

to like meat

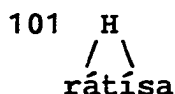
(b) ho *rátíisa* motho nama

INF like-CAUS-a person meat

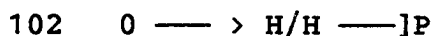
to cause a person to like meat

In (100) we demonstrate that the H tone on the first syllable spreads one mora to the right. Crucially, we show that *rátíisa* (100b) does not have a M tone when it P-governs another constituent. We also cannot allow the H tone to spread once more because we argued in (3.1) and (4.1) above that lexical H tone spreading is not iterative in this language. In fact, we will argue in Chapter 5 that Grammatical H tone spreading is distinguished from lexical H tone spreading by the fact that lexical H tone spreading is not iterative. Only Grammatical H Tone Spreading is iterative. So the M tone in *rátíisã* (99b) must be a

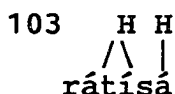
different H tone from the one on the first two syllables. In *rátíisä* (99a) the derived structure after lexical H tone spreading is as in (101) below.



The last syllable is not linked to any H tone. It is also not extratonal. At the ends of P-domains the last syllable gets a H tone by insertion. The rule can be formalized as in (102) below.



If we assume that this rule will insert H tones on all free syllables that are preceded by a H tone, it becomes clear why the rule would not insert a H tone in (98a). The last syllable is extratonal. The only tones that can override this extratonicity are default rules in the sense that at the point where default rules apply, every TBU must have a tone. This means that nouns such as *lehéháadī* in (3.1) also get a H tone at the ends of P-domains in the same manner. That is, just as *rátíisä* gets a H tone on the last syllable, the nouns such as *lehéhádi* get the same H tone at the end of a P-domain. The derived structure is as in (103) below.



The structure in (103) shows clearly that at the end of a P-domain there are two H tones adjacent. These structures violate the OCP. How does all this argument relate to the noun *mosáadī*?

It is related because this noun is non-derived and yet it is pronounced with a M tone on the ultima. We know that the M tone is a product of a H tone which is inserted at the end of P-domain or an underlying H tone. In other words, we will argue that the singly linked H tone that is inserted at the ends of P-domains is the one that will ultimately surface as a M tone. So, how can we lose the H on these nouns so that by the time H insertion at the end of P-domains applies, there is an environment for the rule to apply? This question leads us to conjecture that the underlying representation for the nouns with a FM/HL is /HH/ instead of one multiply-linked H tone.

There are advantages in assuming that the underlying forms of these nouns is /HH/ in spite of the fact that the structure violates the OCP. First, the HH sequence is at the periphery and therefore cannot be regarded as an alarming violation because edges are known to be places where exceptions occur cross-linguistically. In addition, the violation of the OCP is rectified by the deletion of the second H in the W-domain. Since the OCP demands that offensive structures such as the proposed underlying structure for these nouns be repaired, the second H tone is deleted by Meeussen's Rule. On the basis of the data, it would appear that Meeussen's Rule applies at the W-domain. Decisive evidence that Meeussen's Rule applies within the W-domain involves the reflexive prefix and the object markers

that precede monosyllabic noun stems. In (104) below we illustrate this.

104 moítjǐ snob

In moítjǐ (104) the class prefix is toneless, the reflexive prefix is H-toned, and the noun stem also H-toned. The reflexive prefix and the stem are both within the W-domain just as the two syllables in sádǐ (99a). Minimality Condition dictates that the minimum number of syllables for all nouns in Sesotho be two. Hence, the H of the reflexive prefix and that of the noun stem have to be within the same W-domain in (104). If the stem meets the requirements for the Minimality Condition, the reflexive prefix is excluded from the W-domain as in (105) below.

105 moí[póne] self-seer

In (105) the H tone of the reflexive prefix is outside the W-domain because the stem meets the requirements for the Minimality Condition. The two H tones therefore fuse instead of the second one deleting by Meeussen's Rule. One could even argue that the two H tones are allowed to violate the OCP in juncture positions. We will argue in (5.1) below that Fusion is a domain juncture rule in that it applies whenever there are two H tones on syllables that are on separate domains. At this stage we want to stress that there is reason to believe that there is a W-domain in Sesotho. In this W-domain Meeussen's Rule applies to rectify offensive structures. Hence, in moítjǐ (104) it applies as the two H tones are within the W-domain but in

moipóne (105) it does not apply because the H tone of the reflexive prefix is outside the W-domain as the stem meets the requirements of the Minimality Condition. This Minimality Condition is stated in (106) below.

106 Minimality Condition: All nominal units within the W-domain must consist of at least two syllables in Sesotho.

Evidence for this condition is clearly demonstrable in the derivation of nouns of Class 9. This is because nouns of class 9 have a nasal class prefix which deletes if, and only if, the stem has more than one syllable. The rule does not apply if the noun stem is monosyllabic. We explain this phenomenon in terms of the Minimality Condition. The rule for deletion of the nasal is formalized in (107).

107 $N \text{ --- } > 0 / \text{ --- } w[$

Rule (107) simply says that all nasals that are outside the W-domain delete. Rule (107) is relevant for examples such as (108) below.

108(a). n-f'-o -> n-ph'-o -> m-ph-ó gift

CL-ROOT-NOM

(b) n-rát- -> n-tháat-o -> 0-tháato love

(c) n-rékís-o -> n-thékís-o -> 0-thékíisö sale

In *ntháato (108b) and *nthékíisö (108c) the nasal prefix deletes whereas in mphó (108a) it remains intact because it is within the W-domain. This rule makes reference to the W-domain. Meeussen's Rule is the second phonological rule that utilizes the W-domain. Two linked H tones within the

W-domain violate the OCP and therefore the second H tone deletes. This deletion of the second H tone within the W-domain is what is called Meeussen's Rule. It is this deletion which leaves the second syllable of the noun *mosádi* (99a) without a H tone. We formalize Meeussen's Rule as (109) below.

109 H ——— >0 / [H -]W

After the application of Meeussen's Rule, *mosádi* (94b) is gotten. It follows that all words with a HH sequence underlyingly become H0 by Meeussen's rule.

The second advantage of proposing the /HH/ as the underlying structure for FM/HL tonal patterns is that the difference between the FM/HL and FL/HH can easily be explained. In the case of the FL/HH, extratonicity applies because the last syllable is toneless. In the case of the FM/HL extratonicity does not apply because the second syllable is linked to a H tone. Third, there will not be multiply-linked structure at the end of the P-domain so that the added mora will get a default L without crossing association lines.

Given that the underlying structure for the FM/HL is /HH/ and given that the second H tone deletes by Meeussen's Rule within the W-domain, how do we get the M tone? We argued that at the end of P-domain words with a H tone on the penult get a H tone by a rule that inserts such H tones. So, at the end of P-domain *mosádi* is without a tone on the last syllable and this syllable is not extratonal.

Therefore H Tone Insertion (102) applies and inserts a H tone on *mosádi* to give a structure similar to the structure for *rátíisä* (103) as in (110).

```

110   H H
      | |
    mosádi

```

After the application of H Insertion Rule (102) the Lengthening Rule applies and inserts a mora on the penultimate syllable so that the structure in (109) becomes the structure in (111).

```

111   H H
      | |
    mosáadi

```

Default Rules apply, thereby inserting L tones on toneless mora. This leads to the derived tonal pattern LHLH [*mòsáàdí*]. This pattern does not surface in this manner in Sesotho. What happens is that the L tone between the H tone of the first mora of the penult and the H tone of the last syllable cause the second H tone to assimilate regressively. In other words, it is argued that a M tone is a product of a low level rule that merely affects the final H adversely. This rule is assimilatory in that a slow rate of vibration of the vocal cords immediately followed by a fast rate of vibration of the vocal cords leads to a decrease in the rate of vibration of the succeeding sound. So, Downstepping and M Toning are all different points on the scale from L to H. What M(id) T(oning) involves is a significant lowering of the final singly-linked H caused by the L tone in between the two H tones. This can be formalized as (112) below.

113(b)	lesále	mosádi	UR
	N/A	N/A	Extratonicity
	lesále	N/A	H Tone Spreading
	N/A	mosádi	Meeussen's Rule
	N/A	N/A	H Insertion Rule
	N/A	N/A	Lengthening
	N/A	N/A	Downstepping
	lèsalé	mòsádi	Default Rules
	N/A	N/A	M Toning Rule
	[lèsalé]	[mòsádi]	PR

The list of nouns in 00H[LLLH] leotó (72), in 00H00 [LLHLM] leotónyáanā (73) and in 000[LLL] tlhaafu (75) can easily be explained in terms of these rules. There is no H tone on the penult. Lengthening adds an extra mora at the end of P-domain. Toneless moras get L tones by default rules. In (73) where affixes are added to the stems, H Tone spreading one mora to the right applies, leaving the last syllable without a tone. The last syllable gets a H tone by H insertion at the end of a P-domain. Ultimately, the form surfaces as LLHLM. The same holds for the toneless nouns in (75). They get an L tone by default rules. Hence, they all surface as LLL or LLLL at the end of P-domain. However, if the nouns that surface as LLH or LLL are preceded by a H-toned clitic, their class prefixes also surface with a H tone as in (114) below.

114(a) Ke na lé mólamú (00H) I have a stick
 AGR have Ct stick

(b) Ke na lé móloMo (000) I have a mouth
 AGR have Ct mouth

In section (2) we argued that the H tone on the clitic (Ct) spreads one mora to the right. That is, the H tone on the class prefix must be a result of spreading because examples without the H-toned clitic lé as in the negative form of the associative copulative do not surface with a H tone. See examples in (115).

115(a) Ha ké na molamú I don't have a stick
 NEG AGR have stick

(b) Ha ké na molomo I don't have a mouth
 NEG AGR have mouth

The class prefixes of the nouns molamú (115a) and molomo (115b) do not have a H tone confirming that it is the H-toned clitic that contributes the H tone in (114).

We also stressed in (4.0) that the H tone from these clitics does not spread into the stem even if the stem is toneless as in (116) below.

116(a) Ke na lé nama I have meat
 AGR have Ct meat

(b) Ke na lé thlafu I have a leg
 AGR have Ct leg

In (116) the nouns belong to class 9. We posited a Nasal Deletion Rule when we motivated for the Minimality Condition. The stems are toneless. The H tone from the

clitic does not spread to the first syllable of the stems *nama* (116a) and *tlhafu* (116b). We, therefore, have a problem, because our H Tone spreading is always one to the right for as long as there is a toneless TBU. The question is: what is wrong with the TBU within the stem? As a matter of fact, this is not the only problem. We argued that H Tone spreading is lexical as can be shown by the fact that it does not spread to the next word even if the next word has toneless syllables as in (117) below.

117(a) *Ke fá mótho nama

AGR give person meat

I give a person meat

If HTS were postlexical it would not generate ungrammatical pronunciations as in (117). But, what about the H tone on clitics or particles? Why does a H tone on clitics spread one to the right? In addition, why does it spread only to functional parts of every thematic unit? We will attempt to answer these questions in Chapter 3 of our dissertation.

5 Summary

We began this chapter by describing the characteristics of the nominals in Sesotho. Tonal patterns of monosyllabic nominal stems were then analyzed. We demonstrated that a monosyllabic nominal stem can surface as a H tone, a L tone and a M tone. We observed also that the penultimate syllable can surface with either a short vowel or a long one. We noticed that the penultimate syllable whose first

mora is H-toned and the second mora L-toned, is usually followed by an ultima which is M-toned.

We introduced the discussion of the tonal patterns of disyllabic by describing the various syntactic contexts where tonal modifications are found in Sesotho. We noticed that a nominal head which is modified by 'qualificatives' is at the end of a P-domain. This is also true for a nominal head which is linearly the last constituent on the right edge of a sentence. We observed that the tonal patterns for nominal heads on ends of P-domains were either FL or FM.

We proposed an analysis of these tonal alternations by claiming that the ultimas of nouns with H-toned penultimate syllables were extratonal at the ends of P-domains. This proposal allows us to explain why nouns such as *póodi* are pronounced as HLL at the ends of P-domains and as HH within P-domains. At the same time this proposal allows us to distinguish nouns such as *mosáadi* from nouns such as *póodi*. The difference is in the application of the extratonicity rule: the ultima of *póodi* is extratonal whereas that of *mosáadi* is not extratonal.

In addition, we proposed that within a W-domain there is a dissimilatory process which takes place when the OCP is violated within the W-domain. This process is commonly known as Meeussen's Rule. Nouns such as *mosáadi* which escape extratonicity rule undergo this dissimilatory process. Hence, it is possible for these nouns to acquire a H tone

which is inserted at the ends of P-domains if, and only if, the penultimate is H-toned.

We also suggested that Lengthening occurs at the ends of P-domains. The application of Lengthening at the ends of P-domains makes it possible for a HL contour tone to be created on the penultimate syllable. It is this HL contour that is responsible for the surfacing of M-toned ultimas. In short, it is the combination of Lengthening and Default rules that lead to the M Toning of the H tone of the ultima.

Lastly, we observed that tonal assimilation occurs without exception lexically. Except for the H tones on clitics, we noticed that the H tone does not target toneless TBUs on other thematic constituents. The H tone on clitics, however, targets toneless class prefixes of nouns belonging to following nouns. If the stem of such targetted syllables begins with a H tone, we noted that assimilation is always followed by dissimilation. We described this dissimilatory process as R(ight) B(ranch) D(elinking). This dissimilation is motivated by the OCP. It follows that RBD occurs to rectify the violation of the OCP. We also observed that the H tone from these clitics does not target a toneless TBU within the stem. In Chapter 3 we present an analysis of the various particles which have H tones that support these observations.

CHAPTER 3

Tone and Structure of NPs (Part II)

1 Introduction

This chapter is a continuation of Chapter 2. We will be concerned with three issues: a discussion of assimilatory and dissimilatory processes involving H tones on particles, on nominal stems with more than two syllables and derived nominal stems. We will also make comments on the relation between tone and syntax.

Concerning particles, first, we will assume that the lexicon contains two types of lexical items, a type of lexical item which is *thematic* in nature and another which is *functional* in nature. Thematic items can be increased by affixation, reduplication, compounding and derivation. Functional types are finite. Functional types are the ones that play a role in the grammar by acting as heads of maximal projections. Functional elements subcategorize for thematic types. Hence, all maximal projections for thematic types such as nouns, verbs, adjectives, and so forth are headed by functional elements. These functional elements are what we call clitics or particles in this study.

A syntactic string that becomes the input to prosodic rules contains both functional elements and thematic elements. It is therefore reasonable to assume that prosodic rules group these elements according to certain parameters. It is our task to establish the parameters whereby clitics and the thematic constituents are grouped

into prosodic units acceptable to the phonology. We will limit ourselves to functional elements that select NPs in this Chapter.

Firstly, we will discuss particles that head 'qualificative phrases'. Secondly, we will discuss particles that select NPs just as prepositions select NPs. Thirdly, we will discuss particles that act like copulas.

Concerning nominal stems that consist of more than two syllables, we will begin our analysis with trisyllabic stems and then proceed to those that have more than three syllables. Immediately after the discussion of nominal stems with more than three syllables, we will analyze tonal patterns of derived nominals. The chapter will conclude with the implications of the observations made on both Chapter 2 and Chapter 3.

2 Particles as Heads of Qualificatives

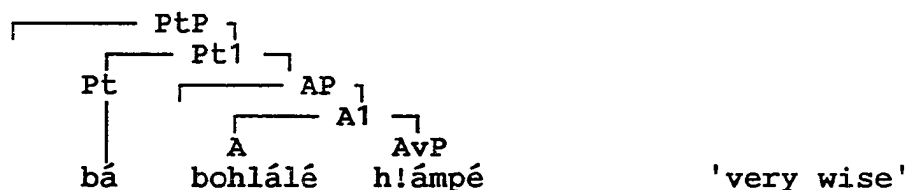
Particles (PtPs) are many. Their structure is rather complex and confusing in Sesotho. This is caused by the range of stems that are selected by the various particles. These stems include nominals with prefixes (adjectives) as in (1) below.

- (1)
- | | | | | | |
|------|-----|------|--------|--------|------------|
| ┌─── | PtP | └─── | | | |
| ┌─── | Pt1 | └─── | ┌─── | AP | └─── |
| ┌─── | Pt | └─── | ┌─── | A1 | └─── |
| ┌─── | A | └─── | A | AvP | └─── |
| ┌─── | tsé | └─── | kg!óló | hahólo | 'very big' |
- Dipódi tsé kg!óló hahóló d!í fihlile.
 *Dipódi ts'é kg!óló hahóló d!í fihlile.
 goats PtP big very AGR arrivePERF
 Very big goats have arrived.

In (1) the particle *tsé* is the head of the projection. The particle selects AP as its arguments. The head of AP is the adjectival nominal *kgóló* which, in turn, also selects the adverb. The particle and the adjectival nominal are independent words phonologically. This is shown by the Downstepping effects. The H tone of the adjectival nominal is downstepped. The PtP is not in the same P-domain as the nominal head as shown by the unacceptable HH tonal pattern of *pódí*.

Another example of these PtP is the so-called relative as in (2) below.

2 Relative Stem



Bathépu bá bohlálé h!ámpé b!a fihlile

*Bathépú b!á bohlálé h!ámpé b!á fihlile

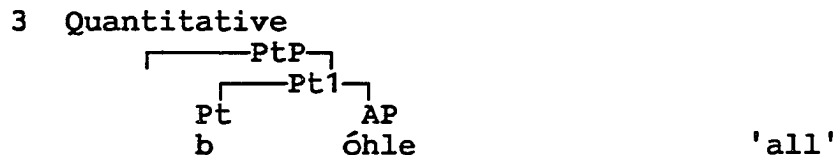
Thembus_PtP wise very AGR arrivePERF

Very wise Thembus have arrived.

In (2) we have a relative nominal as the head of the AP. The head of the PtP is the H-toned particle *bá*. This particle selects the nominal *bohlálé* which, in turn, selects the adverb *h!ámpé*. We should note that there is no Downstepping between the particle and the nominal because the class prefix is L-toned. However, there is Downstepping between the head of the AP and the adverb because the adverb

begins with a H-toned syllable. Once again, a HH tonal pattern is unacceptable because the head is in a different P-domain from the PtP.

The other example of a PtP is the quantitative as in (3) below.



Bathépu bÓhle bá fihlile

*Bathépú bÓhle bá fihlile

Thembus Pt all AGR arrivePERF

All Thembus have arrived

This PtP is treated as a pronoun in Doke and Mofokeng (1957). In Guma (1971) it is correctly classified as a qualificative. It is the structure that might have made Doke and Mofokeng to classify it as a pronoun. The particle which selects the invariable vowel commencing nominal -Óhlë loses its vowel because of hiatus (bá+Óhle = bóohlë). What remains as the head is therefore a consonant in all non-nasal classes and a vowel in nasal classes. In a related language namely Setswana the particle is clearly an independent element such as bá and the nominal selected as another word. Hence, in Setswana the H tone of the nominal is always downstepped as in (4) below.

4 Bá b!óotlhë all (class 2)

Pt all

It is these Setswana examples which strengthen the view that the Sesotho in (3) are indeed PtPs. If one accepts that haplology can delete syllables in languages, there is no reason one could not attribute the loss of one syllable in this PtP to haplology. Once again, a HH tonal sequence is unacceptable because the PtP is not in the same P-domain as the nominal head.

The next PtP to be discussed is the enumerative as in (5) below.

5 Enumerative Stem



Bathépu basélé b!á fihlile

*Bathépú basélé b!á fihlile

Thembus PtP different AGR arrivePERF

Different Thembus have arrived.

This PtP is also characterised by a particle which is merged with the stem. One major difference between this PtP and others is that its particle is underlyingly toneless. If it were H-toned, however, it would be exactly the same as the relative one. There are about three words that make this PtP, namely séle, fé (questions), and marginally phé. The HH tonal pattern is unacceptable. Hence, this PtP is in different P-domain from the P-domain of the antecedent.

Another PtP typical in Sesotho is the demonstrative as in (6) below.

6 Demonstrative Stem



Bathépu hán!á b!á fihlile

*Bathépú bán!á b!á fihlile.

Thembus Pt these AGR arrivePERF

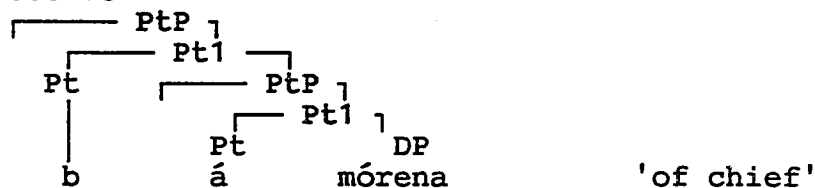
These Thembus have arrived

This PtP is complex structurally. The particle is erroneously taken as a part of the demonstrative word in most grammars (Doke and Mofokeng 1957, Guma 1971). The particle is H-toned. The particle selects quite a number of lexical items. The item for near the speaker varies according to whether the sentence is a question or statement. In addition, the item varies according to the distance of the object relative to the speaker and the hearer. In terms of traditional analyses the lexical items selected by the particles are not independent of the particles. But tonological evidence shows that the particle is independent of the lexical items selected because the H tone on the items selected downsteps when it is adjacent to a H tone on the particle. This Downstepping is a useful diagnosis of two items that are in the same P-domain while, at the same time, they remain independent lexical units. Relative clauses in Sesotho are introduced by one type of these PtPs. Hence, some Bantuists argue that relative clauses are headed by D(eterminers) (Wald 1970). Like these PtPs, relative clauses are also not in the same P-domain as

the antecedent. A HH tonal sequence would be ungrammatical on a head of relative clauses as is unacceptable to demonstratives.

The last PtP to be discussed is the possessive as in (7) below.

7 Possessive



Bathépu bá mórena bá fihlile

*Bathépú bá mórena bá fihlile

Thembus Pt+Pt chief AGR arrivePERF

The Thembus of the chief have arrived

Possessives as in (7) above are not prepositional even though they appear similar to PPs. They are headed by a H-toned particle which merges with the H-toned possessive particle *á*. Prepositions as in (8) below do not have particles derived from the class prefix of the noun.

8 Ke shápá ngwaná k!á phafá

AGR whip child P quirt

I whip a child with a quirt

In (8) there is no concordial agreement between the *ká* and any noun. In fact, *ká* does not have a head. It is a head of the PP. However, all particles that head PtPs are all concordially related to the head noun. Also, unlike a PP the essential meaning character of the projection involving particles does not depend on the particles but on the

selected items that follow particles. The particles act like D(eterminers). Just as NPs will be assumed to be headed by determiners (D), 'qualificatives' are all assumed to be headed by particles (Pt) in this study (see Abney 1987). This assumption allows us to make important generalizations about the behavior of these 'qualificatives'. For instance, we can easily say that a nominal head followed by a PtP is at the end of a P-domain.

It is perhaps this behavior which led Doke to classify possessives with adjectives (see Doke and Mofokeng 1957). Recent studies of languages in this family also confirm that possessives pattern with adjectives phonologically (Myers 1987, McHugh 1990).

2.0 Particles with H Tones that do Not Spread

There is another behavior of the H tones on these particles which needs to be explained. The H tone of the particles that head PtP does not spread one mora to the right even if there are toneless syllables after them. This is illustrated in (9) below.

- 9(a) Batho bá ba ngata bá fihlile.
 People Pt CL stem AGR arrive[perf].
 Many people have arrived.
- (b) Batho bá ba bedí bá fihlile
 People Pt CL stem AGR arrive[perf]
 Two people have arrived.

In (9) above the H-toned particle bá is followed by toneless APs. The H tone does not spread one mora to the right. We

noted in the Chapter 2 (example 36) that the H tone from particles spreads one mora to the right. Here we see that not all H tones on particles spread one mora to the right. We have a problem once more. This is complicated by the fact that it is not only particles heading APs that behave in this manner. The H tone of an instrumental prepositional particle does not spread one mora to the right as in (10) below.

- 10(a) Motho ó shápá ká leswaaí
 Person AGR beat Pt stick
 A person beats with a stick.

- (b) Bá tshwéré motho ká molaala
 AGR hold person Pt neck
 They have held a person by the neck

In (10a) the H tone on ká does not spread to the toneless class prefix of leswai. The same thing happens in ká molaala where the H tone does not spread to the toneless class prefix. The third particle that shares this behavior is the copula in equational sentences as in (11) below.

- 11(a) Thabo ké morena
 Thabo COP CL chief
 Thabo is a chief
- (b) Thabo ha sé morena
 Thabo NEG COP chief
 Thabo is not a chief

In (11a) we have a positive equational sentence. In (11b) the copula is in its negative form. In both cases the H

tone from the particles *ké* and *sé* does not spread one mora to the right. There is no need to give an Appendix for these copulative constructions because the particles do not change. It is either NP *ké* NP or NP *ha sé* NP. What is vital is that the H tone does not spread one mora to the right just like the H tone of the particles heading PtPs.

The other particle that does not spread one mora to the right is the H tone of the agentive phrase or the by phrase as in (12) below. There is a close resemblance between this particle and the copula in the positive.

12 Thabo ó bátluwa ké morena

Thabo AGR stem by chief

Thabo is wanted by the chief

The H tone on *ké* does not spread one mora to the right. So, the by in by phrases, the copula particle in both positive and negative conjugation, the instrumental prepositional particle *ká* and the various particles that head PtPs share two tonal behaviors. First, the H tone on these particles does not spread one mora to the right. The second tonological feature shared by the instrumental or location particle *ká*, by the particles that introduce the adjectival nominals and the relative nominals, by the copula particles, and by the by particle is the fact that once these particles are immediately followed by H toned stems, the H tone on such items downsteps as in (13) for APs, (14) for Instrumental prepositional particle and (15) for copulas and for by phrases respectively.

13(a) Dikgomó tsé kg!óló d!í fihlile

Cattle Pt big AGR arrive[perf]

Big cows have arrived

(b) Nkú é th!átá !é fedile

Lamb Pt hard AGR finish[perf]

Hard mutton is finished

14(a) Ke kgetha nkú k!á p!ódi

AGR choose lamb with/to goat

I choose lamb to a goat

(b) Ke shápá ngwaná k!á tsh!ábo

AGR beat child Pt fear

I beat the child with fear

15(a) Thabo ké p!ódi

Thabo COP goat

Thabo is goat

(b) Thabo ó bátlwa ké p!ódi

Thabo AGR looked by goat

Thabo is hunted by the goat

This Downstepping of the second H tone on the next lexical item leads us to the conclusion that these are independent lexical items which are in the same P-domain. We established this fact in our analysis of the disyllabic nouns in (4.1). This leads us to a discussion of particles whose H tones spread one mora to the right. In other words, the domain for the particles whose H tones spread one mora to the right cannot be the same as the domain of particles where no spreading takes place.

2.1 Particles with H Tones that Spread.

There are several particles whose H tone spreads one mora to the right. These include the *bó* particle associated with nouns of class 2(a), with the possessive particle *á*, with the many so-called adverbial prefixes such as the conjunctive formative *lé*, the directional formative *hó*, the locational formative *há*, and the comparative formative *sá*. All these particles or formatives are characterized by a H tone that spreads to the class prefix of the following noun. In addition to the spreading, the right branch of a spread H disassociates if there is a H tone which immediately follows the targetted TBU. In (16) below we support our claims with one of these particles or prepositions.

16(a) Ke na lé mólala

I have P neck

I have a neck

(b) Ke na lé mosádi

I have P wife

I have wife

In (16a) the H on the particle spreads one mora to the right and thereby lands on the toneless class prefix. In (16b) the H tone on the class prefix is delinked because there is H on the syllable immediately following it. This is evidently a different kind of behavior from the behavior of the H on the particles associated with APs, with particles for the copula for equational sentences or with the *by* particles and the instrumental particle *ká*. These latter

particles do not have H tones that spread to the class prefix. In addition the H on the latter particles makes it possible for the other H on the the following syllable to downstep.

Having identified that particles can be grouped into two major groups tonologically, the question is: is there any syntactic evidence that acts as independent evidence for this grouping? We will argue that there is such evidence. However, an attempt at supplying that evidence will take us too far afield into syntax. We will just mention that the syntactic evidence will show that the hierarchical structure of the phrases is different. We will use the Copulative construction and the directional prepositional phrase to illustrate this.

According to Doke and Mofokeng (1957) the copula and the NP as in (17) below make one word. The NP acts as the base or complement to the Copula. This view is consistent with the traditional grammarian's view on these construction. In languages with overt Case-markings such as Latin, the Case markings on the NP complement show that it is not accusative but nominative as in (18).

17 Mon'na ké mokóoto A man is a dog

Man COP dog

18 Deus est lex God is the law

NP(nom) V NP(nom)

The ké and the mokóoto make one word in (17). In our analysis the two units ké and mokóoto are independent

phonological words within one phonological phrase. Both are, however, daughter heads. So, the mother node is a category that consists of an intersection of all head features of both head daughter nodes by the Head Feature Convention as in (19) below (Gazdar, Klein, Pullum and Sag 1985).

19 [Intersection of Head features]

/	\
COP(H)	NP(H)
[ké]	[morena] is a chief

Our GB theory lacks the mechanism to express this generalization. Hence, we assume tenets of *A Generalized Phrase Structure Grammar* to express these facts. The square brackets indicate the bounds for each unit. In (19) the H-toned copula ké belongs to an independent W-domain from the W-domain containing morena. The copula and the complement are, however, in one phonological phrase.

The other phrases made of particles that have a H tone that spreads differ crucially from those described in (19) by the fact that the particle or the preposition is the only head of the maximal projection syntactically. In other words, the mother node for these particles consists of the head features of the head daughter node only as in (20).

20

	PP	
	/	\
P		NP
[hó	mó][rena]	to the chief

In (20) the head of the projection is the hó particle or the preposition. Hence, the mother category is just PP. The hó particle is not an independent phonological word by itself. The hó particle needs the class prefix to make a phonological word. In other words, particles such as the hó need other clitics to pair up as phonological words. The clitics with which they pair may even be phonologically NULL as in (21) below.

21 PP
 P NP
 [hó 0][Thabo]

In (21) the hó and the zero morpheme make one phonological word. In other words, the phonological word created by these clitics is minimally binary. In the case where a nominal stem and the clitic vie for the same clitic to satisfy the minimality condition, the clitic wins. That is, the class prefix would pair with the clitic rather than with the nominal stem as in (22) below.

22 PP
 / \
 P NP
 [hó móo][thö] to the person

In (22) above the class prefix pairs with the clitic rather than with the monosyllabic stem. That is, prosodic units made of less thematic units are strictly minimally binary in Sesotho.

What do these these syntactic facts lead us to? In our discussion of the monosyllabic noun stems and disyllabic noun stems in Chapter 2, we observed that there were

paradoxes in the behavior of the H tones. H tones from particles do not spread into the thematic units (stems). H tones on some particles do not spread at all. The syntactic discussion is meant to solve these problems. That is, if we assume that the syntactic string is mapped to a string that becomes input to the phonology by prosodic rules, we can explain the paradoxes.

In the light of this assumption, we will claim that in addition to the P-phrases we proposed in Chapter 2, prosodic rules divide a S-structure string into phonological words. We argued for these phonological words in our discussion of the disyllabic stems, but we did not make proposals as to how they are constructed. Nespor and Vogel (1986) propose the construction algorithm for making P-words in (23) below.

23(i) Join into an n-ary branching x^P all x^{P-1}

included in a string delimited by the definition of the domain of x^P .

On the basis of the behavior of the particles, the domain for Sesotho P-word is defined in (23ii) and (23iii) below.

23(ii) P-word domain consists of (a) a stem (b) any element identified by specific phonological and morphological criteria (c) any element marked with the diacritic [+W]

23(iii) Any unattached elements within the syntactic tree form part of the adjacent P-word closest to the stem; if no such P-word exists, they form a P-word on their own [taken from N & V 1986:140].

We find the rules Nespor and Vogel propose for Dutch fit the facts for a Sesotho grammar. Particles such as the *ká* that do not spread and only cause adjacent H to downstep would be marked with a diacritic. Particles that behave as a group phonologically would pair with their respective particles as P-words. Thematic elements (stems) are given their respective statuses as P-words. The rules in (23) combined with Rule 80 prosodically license S-structure strings as input to the phonology. Applying both rules to a sentence as in (24) below creates a prosodic structure as in (25).

24 Mosáadi é mohóló !ó shápa ngwaná k!á leswai lé
 th!átá mmé b!ó Thabo bá móreneng bá ya ráatä h!á h!ó
 l!é jwáalö. [A big woman whips a child with a hard
 stick and Thabo and company of the great Place like
 when things are like that]

25 [mosádí] // [é] [mohólo] [ó shápa] [ngwaná] [ká]
 [leswaai] // [lé] [tháta] [mmé] [bó 0] [Thabo]//
 [bá mo] [reneng] [bá ya] [ráta] // [há] [hó]
 [lé] [jwáló]//

The prosodic structure as in (25) is the one that becomes the input to phonological rules. The phonological rules will then make reference to prosodic domains as indicated in (25). Phonological word domains are within square brackets ([]) while phonological phrases are within two slashes (// //). In other words, for the purposes of the data under

discussion, these are the only two domains that a grammar of Sesotho needs. How do these domains solve our problems?

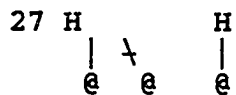
First, the problem of a H tone from particles not being able to spread into the stem is solved. The status of H tones on thematic units and functional units is made the same. A H tone in the P-word domain spreads one mora to the right. HTS is therefore a strictly domain span rule. In Chapter 4, we will show that HTS is also a C-domain span rule. The H tone from one domain cannot spread into toneless TBUs in another P-word domain. Hence, there is no way in which a H tone on particles can ever reach the stem. This is so because the H toned particles do not pair with stems to make phonological words. It is therefore understandable why the H tone on particles in (26) below does not spread into the stem.

26 Ke na lé nama I have meat
 AGR have Pt meat

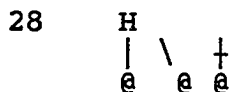
In (26) the H tone cannot spread into the stem because it pairs with the zero morpheme as a P-word. The noun nama makes another P-word.

Second, the H tone on particles can only spread postlexically because it is in the syntax that members of the pair of phonological word made of functional units can be gotten. The HTS which occurs lexically is restricted to thematic units only. Both the HTS which occurs lexically and the HTS which occurs postlexically can be followed by

Right Branch Delinking. Right Branch Delinking is therefore a P-word domain span rule as in (27) below.



We argued in our discussion of the monosyllabic stems in Chapter 2 against a HTS rule that captures these two processes as one process would be flawed on two grounds: the rule violates general principles in phonology in that the rule would be a count rule, and on empirical grounds in that there is no evidence in the language that H tones do not spread when there are H tones following the targetted TBUs. We formalized the flawed rule as in (28) below.



In our analysis, RBD is restricted to the P-word domains. In other words, structures such as the one in (28) will always be rectified by RBD within the phonological words.

Third, the environment for Downstepping becomes even more clear. A H tone adjacent to another on separate phonological words within a P-phrase are a violation of the OCP. Such a violation is repaired by downstepping the second H of the adjacent P-word. However, if there is a P-phrase between the two P-words, Downstepping cannot take place. The violation of the OCP is here ignored or rectified by simply fusing the two H tones into one multiply-linked H tone. So these domains predict exactly

where OCP could be violated without repairing it by Fusion or Downstepping.

Fourth, these domains will also help predict the environment where Spec H Delinking occurs. In our discussion of monosyllabic stems we discussed the situation where a H tone on the reflexive prefix or object prefix is delinked. We said that generally the phonological word for a noun is minimally binary. Hence, there are disyllabic nominal P-words that consist of a reflexive prefix and a monosyllabic stem as in (29).

29 [moítjǐ] self-eater (snob)

Pronunciations of nouns such as moítjǐ (29) become understandable in the contexts of these domains. Within the P-word domain the two H tones undergo Meeussen's Rule. Hence, such nouns as moítjǐ are pronounced like mosádí. However, should the Minimality Condition be satisfied by the stem alone as in (30) below, the reflexive prefix would be in a different domain from the one consisting of the stem.

30 [mo[í [póni]]C self-seer snob

In (30) the H tone of the reflexive prefix is in the C-domain. The two H tones merge instead of the second H tone deleting by Meeussen's Rule. After Fusion, the Spec H tone delinks by Spec H Delinking Rule. Hence, the noun is pronounced moipóni instead of *moíponi. This means that Fusion bleeds Downstepping.

In view of the fact that the H tone that delinks is the one that is linked within the next P-word made of a

branching morphological specifier, one may even be tempted to propose a constraint. The constraint would then rule out any association of a H tone on a higher domain and a lower domain as in moíponi. This is illustrated in (31) below.

31 *H
 | \
 [mo] [í[[póni]w]C

We will argue in Chapter 4 that the constraint is just not valid. The delinking of a H tone on the reflexive prefix and the object prefix is unique to these morphemes. It is just not easy to demonstrate how this applies with nouns because prosodic rules map nouns differently from verbs. In Chapter 4 we will show that the subject prefix, the Case Absorber ya, the object prefix or reflexive prefixes such as in (32) below are in the Clitic Group domain. We will motivate for the level when we discuss the verb in Chapter 4.

32 [ke ya e [tsámaya]w]C

AGR CA OM go

I walk it

We will advance reasons to defend the view that in Sesotho there is a level higher than the P-word but lower than the P-phrase in Chapter 4. This level is called the Clitic group. We will cite various diagnostic tools for identifying the domains. For instance, we will argue that the analysis of the monosyllabic verb and the polysyllabic verb when they are preceded by the reflexive prefix or the object marker is simplified by assuming that the object

prefix or reflexive prefix can either be in the P-word or in the C-domain. When the object prefix is in the C-domain, it can spread into the verbal stem because the C-domain exhaustively contain the P-word. At the same time, if the object prefix is in the P-word domain, it can trigger Meeussen's rule. The C-domain is valid for verbs but not for nouns. Hence, the only problematic nouns are those derived from verbs. We will come back to this in the next chapter.

There is evidence that Spec H Delinking is fed by Fusion. If it were just delinking of a singly-linked H tone on the reflexive prefix, there would be a floating H tone next to the H tone of the stem in cases where the stem is H-toned as in *moipóone* 'self-seer'. We stated in the introductory Chapter that a floating H adjacent to a linked H tone is a violation of the OCP. So, if such floating H tones are present, we do not expect the particle H tone to spread one mora to the right in phrases such as *lé móipóone*. The particle H tone, however, does spread to the *mo* of *moipóone* as in *lé móipóone*. This clearly shows that the H that delinks cannot be a singly-linked H tone. In fact, we will demonstrate later that the perfective H tone does show that floating H tones adjacent to linked H tones are a violation of the OCP. The H tone which delinks in the cases of the reflexive prefix or the object marker is therefore a branch of a multiply-linked H tone. It can be gotten by Fusion or by H Tone Spreading.

Spec H Delinking, however, has to be ordered with respect to H Tone Spreading because H Tone Spreading feeds it. In fact, ordering HTS after Spec H Delinking would mean that toneless stems such as *batli* in *moipáatli* would not never surface with a H tone on the first syllable. We formalize the Spec H Delinking rule as in (33) below.

$$33 \quad \begin{array}{c} \text{H} \\ + \quad \backslash \\ [\text{e} [\text{e} \dots] \text{w}] \text{C} \end{array}$$

Rule (33) merely says: delink any H tone linked to a branch in the C-domain while, at the same time, it is linked with a TBU belonging to the P-word domain. We will restrict this rule to the object prefix and the reflexive prefix in Chapter 4.

Lastly, the ordering restriction necessary between the Right Branch Delinking, Downstepping and Fusion flow from the way the domains are organised. OCP can be violated at a P-phrase domain juncture position. That is, OCP can be violated between P-words that are in separate P-phrase domains. Fusion applies between functional elements that pair up P-words to make a C-domain. Right Branch Delinking is a P-word domain span rule which applies when a multiply-linked H tone within one P-word domain becomes adjacent to another H within the same P-word or within adjacent P-word domains. Downstepping is different from Right Branch Delinking in that it affects only H tones in separate P-words. The P-words involved must P-govern each other. That is, Downstepping deals with juncture position created by P-

words within one P-phrase. The rules are ordered as follows: Right Branch Delinking, Downstepping and then Fusion. We will argue in Chapter 4 that there is a rule which is a mirror image of the Right Branch Delinking, namely, Left Branch Delinking (LBD) which is also motivated by violations of the OCP at the P-word level. Right Branch Delinking and Left Branch Delinking are strictly P-word processes. Downstepping is P-phrase domain process. This completes our discussion of assimilatory and dissimilatory processes which involve H tones on particles. In section (3) and (4) below we discuss assimilatory and dissimilatory processes which involve nouns with more than two syllables as well as derived nominals.

3 Assimilation and Dissimilation of H Tones in Nouns that Consist of More than Two Syllables

Let us begin our discussion of these nominals by analyzing trisyllabic nominal stems. As has been the case with monosyllabic nominals and disyllabic nominals, the prefix is not counted in establishing the number of syllables for trisyllabics. By trisyllabic nominals, we mean nouns that have a stem with three syllables. The list in (34) contains possible surface forms for the trisyllabic nouns at the end of a phonological phrase.

34(a)	polóoto	LFL	'plot'
(b)	phókóojwe	HFL	'jackal'
(c)	naléedi	LFM	'star'
(d)	le-pákéetlä	HFM	'stirring people'
(e)	le-béleeté	HLH	'untamed animal'
(g)	mo-tswebeeré	LLH	'confusion'
(h)	mo-polookgo	LLL	'type of dance'

In (35) below we illustrate pronunciations of the nouns in (34) within a phonological phrase.

35(a)	polótó	LHH	'plot'
(b)	phókójwé	HHH	'jackal'
(c)	nalédi	LHL	'star'
(d)	le-pákétla	HHL	'stirring people'
(e)	le-béleté	HLH	'untamed animal'
(f)	mo-tsweberé	LLH	'confusion'
(g)	mo-polokgo	LLL	'type of dance'

If we cut off the first syllables on the left edge of every noun stems in (34) and (35), we immediately notice that the tonal patterns for trisyllabic nouns are not crucially different from disyllabic ones. The patterns in (34) and (35) are as represented in (36) and (37) respectively.

36(a) FL	37(a) HH
(b) FL	(b) HH
(c) FM	(c) HL
(d) FM	(d) HL
(e) LH	(e) LH
(f) LH	(f) LH
(g) LL	(g) LL

In (36) and (37) the tonal patterns are the same as tonal patterns for disyllabic nouns. It is the additional syllable that slightly changes the picture. If, for instance, the additional syllable on the left edge is H-toned, such a syllable will either precede another H tone or a toneless syllable. Consequently, the presence of the H has serious repercussions for the analysis given for both the monosyllabic stems and disyllabic stems. In the case where the H precedes another H as in *phókójwe* (34b) and *lepákétlä* (34d), it is theoretically interesting to ask what the representation for the tones has to be. Is the surface tonal sequence (HH) on the left edge of these nouns a consequence of a HH underlying structure or a multiply-linked H tone?

First, we will argue that the H on the first syllable of *phókójwe* (34b) is a multiply-linked H tone on the first two syllables of the noun stem. This implies that the OCP constraint concerning the representations of underlying forms dictates that the first two H tones that are structurally adjacent in the underlying structure are ill-

formed. A well-formed representation is therefore supposed to be one H doubly-linked to the first two syllable as in (38) below.

38 H
 | \
 phókójwe

There are two independent reasons for this analysis. First, the phonetic evidence that the first two moras are pronounced at exactly the same pitch is overwhelming. It is our belief that if each mora had its own H tone, there would be a slight phonetic difference. Secondly, we also know that once the H tones are structurally adjacent, the pitch of the second H usually changes significantly. We have shown this to be the case in the Downstepping process and the Mid Toning one. Since Sesotho has no single case where any of these surface tones surfaces within a noun stem, it is reasonable to conclude that Mid tones and downstepped Hs are lacking on the first two syllables of noun stems because the Hs on these syllables are all pronounced as one level H tone. Hence, we conclude that the two surface Hs are just a surface manifestation of an underlying multiply-linked H tone. No OCP violation is allowed on the left edge. It is only at the right edges where such a violation of the OCP is allowed because the language has a mechanism whereby this violation can be rectified. Recall the case of mosáadī (UR: HH).

There may be other proposals for analysing these patterns. For instance, it may be argued that since HTS

involves spreading a H tone one to the right, the multiply-linked H tone on the first syllable is a result of spreading in (34b) and (34d). This analysis, while it nevertheless does not radically contradict the analysis that the H tone in the first two syllables of *phókójwé* and *lepákétla* is underlyingly multiply-linked, is flawed. In *phókójwé* (35b) the third H tone that suddenly surfaces on the ultima would have no source because our HTS rule spreads H tone one mora to the right and is not iterative. If HTS rule were iterative, we could expect the H tone on the first syllable of the noun *phókójwé* to spread one mora to the right twice to give us the desired HHH surface tonal pattern. Since we know that HTS rule is not iterative, we expect to have a HHL instead of a HHH tonal sequence. That is, *phókójwé* (35b) is supposed to be pronounced as **phókójwe* instead of *phókójwé* because the noun is within a P-phrase. At the end of a P-phrase as in *phókóojwe* (34b), the noun is supposed to be pronounced correctly because HTS rule would spread the H tone one mora to the right with the result that the desired HHL tonal sequence could be gotten. The extra mora on the penult would be added by Lengthening rule. But, since we know that within a P-phrase, the noun is pronounced with a level H tone on all three syllables, we cannot but accept that the first two syllables are associated with one multiply-linked H tone. We cannot even assume that after HTS rule has applied, a H tone is inserted because *phókójwé* (35b) is within a P-phrase. H tones can be inserted at the

end of P-phrases, not within P-phrases. The proposal that it is the first syllable that is underlyingly H-toned would therefore have to be accompanied by several statements indicating the exceptions. This extra burden of information is obviously undesirable for the grammar. Hence, we will stick to the view that the two moras have to be represented as one doubly-linked H tone.

There is yet another analysis, which is equally flawed, namely that the underlying structure for *phókóojwe* (34b) and *phókójwé* (35b) is a HH0 tonal sequence as in (39) below.

39 H H
 | |
 phókójwe

The structure in (39) is ill-formed because the HH tonal sequence is only allowed on the right periphery where the violation of OCP can be rectified by M Toning. On the left edge, identical autosegments are not allowed in Sesotho. Hence, the representation is ill-formed on the grounds of the OCP. Besides, we have argued that within a phonological word a sequence of H tones undergoes Meeussen's rule. In other words, the second H tone in (39) is supposed to delete by Meeussen's rule so that the resultant form may be a HLL tonal sequence instead of the desired HHL in (34b) or a HHH in (35b). To assume that the first two syllables of the nouns in (34b) and (35b) is a sequence of H tones is therefore a wrong assumption. The first two syllables of the nouns in (34b) and (35b) are associated with one doubly-linked H tone.

The underlying structure for nouns such as *lepákéetlā* (34d) and *lepákétla* (35d) is also a doubly-linked H tone on the first two syllables and one H tone on the ultima as in (40) below.



The underlying structure as in (40) above is motivated on the same grounds as the structure in (38). A sequence of H tones on the left edge is disallowed on the grounds of OCP. Besides the OCP, a sequence of H tones on all three syllables of the noun *lepákéetlā* (34d) would yield wrong results in that Meeussen's rule would delete first delete the H tone on the ultima and secondly the H tone on the middle syllable. The results would be a form with an ungrammatical HLL tonal sequence at the end of a P-domain and within a P-domain. There would be no H tone on the penultimate syllable with the result that no M tone could be gotten. In our analysis the underlying structure for the nouns in (34d) and (35d) consists of one doubly-linked H tone and a second H tone on the ultima. The second H tone deletes by Meeussen's rule within a phonological word. A H tone is inserted at the end of a P-domain. This H tone is the one that ends up pronounced as a M tone. In other words, the analysis which we gave for *mosādī* holds for the noun *lepákéetlā* (34d). The difference is that *lepákéetlā* consists of three syllables; the first two of which are associated with a doubly-linked H tone.

The case where a H precedes a toneless syllable followed by a H tone, on the other hand, is interesting on a different count. The L between the two Hs as in le-béleté (34e) can be a product of two types of processes, namely either a delinked H tone which reaches the surface as such and thus gets a L tone by default or a toneless mora that remains toneless until the application of default rules. Because our spreading rule is one mora to the right, we cannot expect the delinking process to be a Left Branch Delinking rule. It has to be a Right Branch Delinking. In other words, HTS rule applies as in (41) and is followed by Right Branch Delinking as in (42).

41 0 H 0 H
 | \ |
 lebéleté

In (41) the second syllable of the stem is underlyingly toneless. There is therefore a toneless TBU to the right of the H tone on the first syllable. HTS rule applies. Application of HTS rule leads to a violation of the OCP within the phonological word. Hence, Right Branch Delinking applies to rectify the violation of the OCP as in (42) below.

42 H 0 H
 | \ |
 lebéleté

We have already rejected an analysis that explains this phenomenon in terms of a HTS rule that forbids the application of spreading in case the syllable after the target is a linked one. We propose a two stage process

namely HTS and then RBD. Application of Right Branch Delinking leaves the middle syllable without a tone. This toneless mora on the middle syllable then gets a L tone by default rules when all toneless mora get their L tones. So, this is evidence that Right Branch Delinking takes place within a P-word domain.

Another proposal for the HLH sequence in *lebéleeté* (34e) is possible. It could be argued that it is the last syllable that does not have a tone underlyingly. The assumption behind such an analysis can only be that there are two singly-linked Hs on the first two syllables of the noun. Since these two H tones are structurally adjacent, they violate OCP and thus are rectified by letting HTS rule to apply and thereafter the left branch of the multiply-linked H tone to delink. This proposal is undesirable because it introduces delinking of the left branch instead of the right. So far, we have allowed the right branch to delink. Besides we have just argued that only the last right edge of a word is allowed to have the last two syllables with two structurally adjacent Hs in Sesotho. Even this representation, we argue, is undesirable and thus is rectified by Mid toning the final H tone at the end of a P-domain or deleting the H by Meeussen in non-final positions. We therefore conclude that the correct representation is the one given in (41) above.

There is one syllable between the two linked H tones which is toneless. This toneless syllable separates the two

linked H tones. This fact, coupled with our earlier discussions involving R(ight) B(ranch) D(elinking) taking place when a H tone from a particle spreads and becomes adjacent to another H tone as in (41), confirms that two H tones separated by a toneless syllable are not structurally adjacent in Sesotho. Recall the OCP parameters discussed in Chapter 1. In addition, this confirms that RBD is indeed a phonological word domain rule.

There is yet another pronunciation for some nouns with a structure as in (41). The HLH is pronounced as HL. The noun *lebélèète* can be pronounced as *lebéleet*. That is, it can be pronounced without the last syllable. This pronunciation, though rare and intuitively unacceptable, is possible. It is intuitively unacceptable because the syllable is always unchecked in Sesotho. The *lebéleet* example gives the impression of a last syllable which is closed. The loss of the ultima of nouns such as *lebélèète* occurs at the end of P-domain. We will argue that this loss of the last syllable and its H tone has no serious consequence for the analysis which we have thus far given. If we were to be interested in this irregular process of losing the last syllable, we would have to assume that it happens as a late rule that simply wipes off the last syllable as well as the H tone on it at the end of a P-domain. The problem with this late rule would be that it would have to be sensitive to the origin of the item since the loss of the last syllable only occurs systematically

with nouns borrowed from Germanic languages. No Sesotho noun seems to undergo the process of losing the final syllable. In other words, it is not possible to have H tones deleting in nouns such as *motswebeeré* (34f) because such nouns are not borrowed from other languages.

Beyond these comments there does not seem to be any new issues relating to the alternations in (34) and (35). All rules posited thus far are adequate to account for the alternations. Hence, it should suffice to conclude the discussion of trisyllabic nominals by making a derivation as in (43). (43) below illustrates the interaction of the rules that map the underlying structure to the surface phonetic forms.

43	$\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{lebé} \text{le} \text{té} \end{array}$	UR
	-----	Extratonality
	lebélété	HTS
	lebéleté	RBD
	-----	H Tone Insertion
	lebéleeté	Lengthening
	-----	Downstepping
	lèbélàèté	Default
	-----	M Toning
	[lèbélàèté]	PR

This derivation succinctly captures the relationship among rules. We now proceed to noun stems with more than three syllables.

4 Quadrisyllabic and More

There is absolutely no new insight we can gain by providing a detailed analysis of noun stems with more than three syllables. The rules we have thus far posited can account for all non-derived noun stems. If this is correct, as we will argue, we only need to make a derivation and provide examples of noun stems with more than three syllables. Examples are given in (44).

44 Four Syllables at the End of P-domain

(a) kwakwaríri	strong person
(b) kgáitsédi	sister/brother
(c) hlóhλόjané	type of stone
(d) hélémeté	helmet
(e) kgapúmpú	name of plant

See also the list of nouns in (45) where more than four syllables make the stem. There does not seem to be any reason why the principles we have proposed for nouns with three syllables and less cannot account for these nouns.

45 More than Four syllables in a Stem

(a) kokolofítwë	name of bird
(b) semányamányané	someone
(c) nónobetsánë	earthworm
(d) mán`kgweshéphe	ugly lizard

Pronunciations of the nouns in (44) are as in (46) in within a phonological phrase.

46 Non-ends of P-domains (within a P-phrase)

- | | |
|----------------|----------------|
| (a) kwakwarírí | strong person |
| (b) kgáítsédi | sister/brother |
| (c) hlóhlójané | type of stone |
| (d) hélémeté | helmet |
| (e) kgapúmpú | type of plant |

Also, nouns in (45) above are in (47) below. There is just nothing interesting in the alternations.

47 Non-ends of P-domains (within a P-phrase)

- | | |
|--------------------|--------------|
| (a) kokolofítwe | name of bird |
| (b) semányamányané | so and so |
| (c) nónóbetsáne | earthworm |
| (d) mán`kgweshéphé | ugly lizard |

Once again, there is just nothing significant about these lists. The alternations can all be accounted for by the principles that have already been established as will be done at the end of this section.

There is something else interesting though. This is the asymmetry in the tonal patterns. This asymmetry is more conspicuous because the stems have more syllables. We summarize the patterns that are significantly lacking in (48).

- 48(a) HLLH
 (b) HLLL
 (c) HLLH

In (46) it has to be stressed that no two L tones within the stem are possible in Sesotho. This is to be

expected because the rule for spreading allows spreading one to the right only. It is not iterative at all. That only one L is allowed to follow a H at a time within a stem is consistent with our claim that delinking is a repair strategy for violations of the OCP within the P-word domain. If there were one syllable without the tone next to the delinking one, there would be no valid reason to connect the delinking with OCP violation since the Hs would not have been adjacent. As a matter of fact, we would predict that the spread H tone would remain linked on the TBU. What these data do, therefore, is to provide decisive evidence that the principles and rules below are responsible for mapping the underlying representations to the phonetic forms in Sesotho non-derived nouns:

- (a) OCP constraint for disallowing representations of identical autosegments in the underlying structure
- (b) Extratonicity at the end of a P-domain
- (c) High Tone Spreading one mora to the right
- (d) Lengthening of the penult syllable at the end of P-domain
- (e) Meeussen's Rule within the P-word domain
- (f) Right Branch Delinking within the P-word domain
- (g) Mid Toning of H at the ends of P-domains
- (h) Downstepping of H across constituents of the P-domain
- (i) Fusion of H tones

(j) L tone Default Rules

Some of these rules must be crucially ordered. However, it is important to note that with these rules all alternations involving non-derived nouns can be accounted for. In essence, the major processes are assimilation (spreading) and dissimilation (delinking). We conclude by making a derivation for the nouns *nónóbetsáané* in (49) and *mán`kgweshéphé* in (50).

159	$\begin{array}{c} \text{H} \quad \quad \text{H H} \\ \quad \quad \\ \text{nónóbetsáné} \end{array}$	UR
	-----	Extratonality
	nónóbé----	HTS
	nónóbetsáné	RBD
	-----tsáne	Meeussen's Rule
	nónóbetsáné	H Insertion
	nónóbetsáané	Lengthening
	-----	Downstepping
	nónóbètsáané	Default Rules
	nónóbètsáàně	Mid Toning
	[nónóbètsáàně]	PR

The derivation for *mán`kgweshéphé* in (50) below also lends some conclusive support to our analysis. (For lack of symbol, the ` sign after a consonant means that the consonant has a mora that carries H tone. Only sonorant consonant are capable of carrying a mora in Sesotho). This item is within a P-domain.

160	$\begin{array}{c} \text{H} \quad \quad \quad \text{H} \\ \quad \backslash \quad \quad \\ \text{mán} \backslash \text{kgweshé} \text{phé} \end{array}$	
	-----	Extratonicity
	mán`kgwéshéphé	HTS
	mán'kgweshéphé	RBD
	-----	Meeussen's Rule
	-----	H Insertion
	-----	Lengthening
	-----	Downstepping
	mán`kgwèshéphé	Default
	-----	M Toning
	[mán`kgwèshéphé]	PR

In (50) we have an example of one word P-governing another. (49) and (50) represent what we regard to be crucial environments where tonal modifications are possible. These examples contain enough syllables for any claim to be tested. We now analyse derived nominals. Our sole aim will be to provide more evidence for the analyses given thus far.

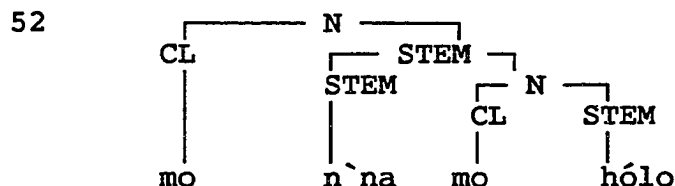
5 Assimilation and Dissimilation of H tones in Derived Nominals

In the introduction, we gave two examples of derived nominals. We will add more examples of these nominals in (51) below. In (51a) we have a derived nominal consisting of two nominal stems (a noun stem and an adjectival stem), in (51b) a derived nominal made of an ideophonic stem, in (51c) a derived nominal based on an adverbial stem, in (51d)

a derived nominal based on a verb stem and, lastly, in (51e) a derived nominal built on a phrase.

- | | | |
|-------|---------------|-----------------|
| 51(a) | mon`namohólo | old man |
| (b) | boswahaswahla | cracking |
| (c) | botjená | being like this |
| (d) | mofányéhi | hangman |
| (e) | sethíbámathé | loved one |

In mon`namohólo (51a) we have an example of a noun whose STEM is a compound one in that it consists of a noun STEM n`na and an adjectival nominal mohólo. The structure in (52) below shows the relationship between the parts of the noun.



The structure in (52) shows that the noun mon`nä pronounced with a M tone at the end of P-domain is here pronounced with a L tone on the final syllable. This is so in spite of the fact that what follows the noun is one of the 'qualificative' nominal mohólo. Recall that it has been argued that a noun followed by one of the 'qualificative' is at the end of a P-domain. However, in (52) the 'qualificative' mohólo is part of the STEM. This means that when prosodic rules apply and assign a prosodic structure to the word, both the noun STEM n`nä and the 'qualificative'

mohólo are grouped as one STEM within the phonological word domain. Hence, it is understandable why instead of the M tone the last syllable of the noun is pronounced with a L tone in this context. Underlyingly, the n`ná is not at the end of P-domain. Hence, Meeussen's rule applies and deletes the H tone on the last syllable of n`ná. In short, the elements of a compound noun as in (52) are all within a P-word domain and liable to processes that apply within the P-word domain.

In *boswahaswahla* (52b) an ideophone *swahaswahla* is used as a STEM for the noun. There is just nothing interesting in this process. The ideophone retains its tone. In *botjená* (52c) we have an adverb *tjená* as STEM for the noun. This is also not interesting. However, if reduplication takes place, it is interesting to note that the H on the last syllable of the noun will spread one mora to the right as in *botjenátjéená*. Assuming that the noun is at the end of P-domain, this spreading one to the right is then followed by H insertion. The H tone on the ultima, in turn, ends up pronounced as a M tone. All these processes are predicted by our rules. This pretty much covers cases of derivations which are based on non-verbal stems. We will now discuss deverbatives (nouns derived by using verbal roots). Examples are *mofányéhī* (52d) and *sethíbámathé* (52e).

5.0 Simple Deverbatives

By simple deverbatives we refer to nouns not formed by a VP but by at least a verb root together with nominal derivational morphemes or a verb root plus one or more affixes together with derivational morphemes. Complex deverbatives will be discussed in 5.1. These are nouns formed by attaching the noun class prefix (CL) to a phrase or sentence.

There are several kinds of simple deverbatives. In (53) below we give a short list. (53a) *mopá láamĩ* is an example where the noun STEM consists of a verb ROOT and an agentive suffix *i*. (53b) *mongól`lĩ* is an example where the STEM consists of a verb ROOT, one verbal extension AFFIX and an agentive suffix *i*. (53c) *moikákásĩ* illustrates the structure of a deverbative comprising a reflexive prefix *i*, a verb ROOT, and an agentive suffix *i*.

- | | |
|-----------------------|--------|
| 53(a) mo-pá láam-ĩ | rider |
| CL-ride-Agent | |
| (b) mo-ngól'-ll-ĩ | lawyer |
| CL-speak-APPL-Agent | |
| (c) mo-i-kákáas-ĩ | snob |
| CL-REFL-lift up-Agent | |

The nouns in (53) are enough to illustrate the point about the tone and structure of simple deverbatives. We will use *moikákáasĩ* to illustrate the structure and the tone of these nouns. In (54) below the reflexive prefix *í* is shown to be having a H tone. The verb root *kákas* is

associated with a floating H tone. This floating H tone links with the first syllable by an Initial H Tone Association Rule to be discussed in Chapter 4. As we argued earlier, the class prefix (CL) and reflexive prefix make a separate phonological word outside the phonological word composed of the STEM.

54 [mo í]w [kákasi]w

In (54) we have two P-words. The first consists of functional units and the second of a thematic unit. The first P-word ends with a syllable which is H-toned. After the application of the Initial H Tone Association rule the second P-word acquires a H tone on the first syllable. The two H tones are structurally adjacent and therefore violate the OCP. The two H tones undergo Fusion as in (55) below.

55

$$\begin{array}{ccc} \text{H} & & \text{H} \\ | & & | \\ [\text{mo } \acute{\text{i}}]w & [\text{kákasi}] & \text{--->} & \begin{array}{c} \text{H} \\ / \quad \backslash \\ [\text{mo } \acute{\text{i}}]w & [\text{kákasi}]w \end{array} \end{array}$$

The fused H tone then spreads one mora to the right by HTS rule as in (56) below.

56

$$\begin{array}{c} \text{H} \\ | \quad \backslash \quad \backslash \\ \text{moikákási} \end{array}$$

The spec H tone (the left branch of the fused multiply-linked H tone) delinks by Spec H Tone Delink rule as in (57) below.

57

$$\begin{array}{c} \text{H} \\ + \quad \backslash \quad \backslash \\ \text{moikákási} \end{array}$$

The final syllable of the noun gets H tone by H Tone Insertion rule at the end of a P-domain. An extra mora is

added on the penultimate syllable. This additional mora associates with a l tone by Default rules. A F tone is thus created on the penultimate syllable. M Toning of the H tone on the ultima takes place. The noun *moikákáasī* is thus derived.

Spec H Tone Delinking is fed by Fusion and HTS as can be demonstrated in (58) below.

58 *mo-í-patl-i* --> *moípátli* --> *moipáatlī*

CL-REFL-look-NOM --> HTS --> Spec H Delinking

Evidence that it is the Spec H Tone Delinking we show examples in (59) where Fusion occurs and is not followed by a Spec H Tone Delinking. The left branch does not delink because the examples in (59) are for two P-phrases. We argued for these P-phrases earlier.

59(a) *Kgomó é kg!óló* A big beast

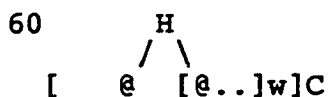
beast Pt big

(b) *Motsweberé ó mongaata* Much confusion

confusion Pt much

In (59a) the noun *kgomó* ends with a H tone and is followed by a 'qualificative' which is headed by a H tone particle *é*. In (59b) *motsweberé* is also ending with a H tone and is qualified by a 'qualificative' which is headed by a H tone particle *ó*. Between the head nouns *kgomó* and *motsweberé* and the 'qualificative' *é kg!óló* and *ó mongata* respectively there is a P-domain juncture. Fusion occurs but is not followed by Delinking, because the left branch is not a reflexive prefix or an object prefix. We have argued

that Fusing two H tones or merging the H tones into one as in (60) is not new in the literature (see Seitsema 1989, Cassimjee 1986, Kisseberth 1989, 1990, etc).



What the structure in (60) shows is that this Fusion of the H tones occurs in juncture positions. This environment is not unusual in prosodic phonology to trigger phonological rules (Selkirk 1980, Nespor and Vogel 1986). In languages where Fusion has been discussed as in Seitsema's data, the constraint that Fusion occurs in juncture positions is not obvious. We build the juncture into the rule to constrain the rule. Fusion should not happen as it pleases. Since Fusion is a juncture rule, it is crucially ordered with respect to Downstepping which is also a juncture rule.

There is one common thread to these rules. They all seem to be responses to violation of the OCP. Within the P-domain violations are repaired by Downstepping. Between two P-phrases violations are allowed. Between the C-domain and P-word violations are mended by Fusion. Within the P-word domain, violations are corrected by Right Branch Delinking and Meeussen's rule.

We conclude our discussion of the simple deverbative by making a derivation in (61).

61	$ \begin{array}{c} H \quad H \\ \quad \\ mo\acute{i}tj\acute{i} \\ H \quad H \\ \quad \\ mo\acute{i}tj\acute{i} \\ \text{-----} \\ \text{-----} \\ \text{-----} \\ mo\acute{i}tj\acute{i} \\ mo\acute{i}tj\acute{i} \\ mo\acute{i}itj\acute{i} \\ \text{-----} \\ m\grave{o}\acute{i}\grave{i}tj\acute{i} \\ m\grave{o}\acute{i}\grave{i}tj\ddot{i} \\ [m\grave{o}\acute{i}\grave{i}tj\ddot{i}] \end{array} $	UR IHT Association Extrametricality HTS RBD Meeussen'Rule H Insertion Lengthening Downstepping Default M Toning PR
----	--	---

Another example that has been used to demonstrate the applicability of the rules in our analysis is *moikákáasi*. We give a derivation for it in (62) below.

62	$\begin{array}{c} H \quad H \\ \quad \\ \text{moikákasi} \end{array}$	U R
	$\begin{array}{c} H \quad H \\ \quad \\ \text{moikákasi} \end{array}$	IHT Association
	-----	Extratonicity
	$\begin{array}{c} \text{moikákási} \\ \text{-----} \\ \text{-----} \end{array}$	HTS RBD Meeussen's Rule
	$\begin{array}{c} H \\ / \quad \backslash \\ \text{moikákasi} \end{array}$	Fusion
	$\begin{array}{c} H \\ / \quad \backslash \\ \text{moikákasi} \end{array}$	Spec H Delinking
	moikákási	H Insertion
	moikákási	Lengthening
	-----	Downstepping
	mòikákási	Default
	mòikákási	M Toning
	[mòikákási]	PR

The derivation illustrates clearly that the linking of the H on verb roots occurs in the process of word formation. In other words, a verb ROOT is taken with its floating H and combined with the rest of the affixes which may or may not be linked with H tones. If we were to assume the contrary, namely, that tone rules apply on verb ROOTS and thereafter word formation takes place, we would get incorrect results. The noun *sekgúrúmetso* (UR: *sekgurumetso* with a floating H because it is a H-toned verb) is a good example for showing how wrong results could be gotten. The noun *sekgúrúmetso* is a quadrisyllabic derived nominal. If tone rules were to apply before word formation, the verb ROOT would have a

multiply-linked H tone on the first two syllable by IHT Association and HTS. Then, as more affixes are attached, the verb root which has a multiply-linked H tone by HTS, would spread one mora to the right as in *sekgúrúmétso*. The last syllable would be without a tone. A H tone would then be inserted by H Tone Insertion at the end of a P-domain. Ultimately, the final syllable would be pronounced as a M tone. That is, the noun *sekgúrúmetso* would be pronounced **sekgúrúméetsö*. This example is decisive in showing that the different processes discussed here actually occur during word formation. For details of the derivation, the derivation for *moikákáasī* (62) should suffice. This pretty much covers simple deverbatives. We now address the complex ones.

5.1 Complex Deverbatives

Complex deverbatives are nominals formed by attaching a class prefix to a phrase or a sentence. The process of forming new nouns in this manner is very typical in Sesotho and other languages of the family. In Sesotho examples of this can easily be found in any praise poem or heroic poetry such as Mangoaela's *Dithoko tsa Basotho*, Damane and Sauders' *Dithoko*, Kunene's *The Heroic Poetry of the Basotho*, Jankie's *Makolwane a Kajeno*. These texts have many deverbatives. (63) below is a list taken at random from Mangoaela's collection of such deverbatives.

- 63(a) se-ya-bohwéng
 CL-go-in-laws at
 the goer to the in-laws
- (b) bó-n`ka-ó-tlíse-kwáno
 CL-take-you-bring-here
 the chance takers
- (c) mmá-mará-á-má-lata-thamah-ana
 mother of-regiment-of CL-fetch-prey-DIM
 brave hunters
- (d) maháták!áth!áta
 CL-walk-with-vigour
 brave advancing warrior

We could have a much longer list than this. For our purposes the list in (63) should suffice. These deverbatives are definitely esoteric and interesting. Much of their structure will be clearer in the context of our exposition of the VP in Sesotho. Morphologically, these deverbatives consist of a class prefix (CL) attached to a phrase. We will use maháták!áth!áta (63d) to illustrate our point. The phrase is a VP hátá k!á th!áta (step with vigour). To this phrase a class prefix ma- is attached and the phrase changes into a nominal.

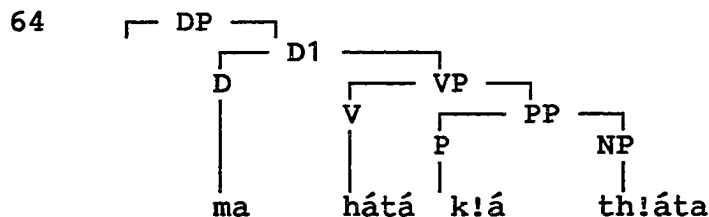
The process can be complicated at times. In some cases, the nouns mme (mother) and rre (father) are added to the already derived nominal. This is the case in mmámálatathamahana (63c) where the nominal mmé is attached

to a derived nominal *malatathamahana* derived from the VP *lata thamahana* (fetch prey).

Morpho-syntactically the class prefix is interesting in its own right. The external theta role which the VP assigns is given to it. This is perhaps what might have led Myers to argue that the class prefix is the head of the NP (Myers 1987). Our interpretation does not seem to contradict Myers in any significant way. However, our claims are different. Our claim is that the data in (63) are derived nominals only if we take them to be gerundive in nature. The subject positions of these gerunds, however, are theta positions. These positions are filled by class prefixes. It is these class prefixes, then, that receive the external theta role assigned by the VP. There are reasons for these claims.

First, only class prefixes that can be specifiers to noun stems that can play the role of a doer or any of the thematic relations associated with the subject of a sentence participate in the formation of these structures. Some of these class prefixes are *mo-*, *ba-*, *le-*, *ma-*, *se-* and *di-*. The commonest of all is the *ma-* for collectivity. Semantically, therefore, there is evidence that the class prefixes receive whatever theta role is assigned by the VP. Examples *seyabohwéng* (63a) and *maháták!áth!áta* (63b) can illustrate this point. The *se* part of *seyabohwéng* has the meaning of doer of the action. The same is true for the *ma* part of *mahátákátháta*. The agent role is in the *ma*.

Second, in cases where the INFL is tensed, it is argued that the AGR receives the external theta role via co-indexation with the external argument. We argued earlier that it is this feature which makes it possible for the language to allow the so-called subjects to be dropped or inverted. The AGR element in Sesotho is a copy of the class prefix. Little wonder that in this case the class prefix gets the external theta role. In other words, to argue that the external theta role is received by the class prefixes in these constructions is consistent with our earlier analysis. The structure of the gerunds is illustrated in (64) below.



It is clear in (64) that the head of DP is the class prefix *ma*. Hence, it is reasonable to conclude that the head of the NP is the Determiner. Thus, Myers' conclusion that in Shona and other Bantu languages the class prefix is the head of the NP needs to be stated differently (Myers 1987). We state this as follows: The class prefix is the functional element which acts as the head of a DP projection. As a functional head of a DP projection, the class prefix selects a number of phrases as its arguments. In (64) the class prefix selects a VP as its arguments.

The process of forming gerunds of this kind is common among speakers who still live the traditional Basotho life.

With these speakers, formations of this kind are as productive as forming a simple deverbative. This is so because traditional life demands that everybody participates in the drama of poetry where such constructions are rife. Unlike in Shona (if Myers is right), therefore, word formations involving the attachment of the class prefix to a phrase is productive in Sesotho.

Tonological evidence that the product of the process of attaching a class prefix to a phrase or sentence gives rise to gerunds instead of words is conclusive. In *seháták!áth!átá* (63d), for instance, the H on the first syllable of the verb stem spreads one mora to the right even though there is a lexical H tone which follows the target. This is not allowed within a P-word domain. Secondly, the H on the preposition *ká* downsteps once adjacent to the H tone which is produced by spreading. No Downstepping is allowed within a P-word domain. Lastly, the H on the first syllable of the qualificative nominal also downsteps. This is also not allowed within a P-word domain. Are these data counterexamples? We argue that these are not counterexamples. Instead these data are evidence to show that the products of the process of forming constructions by attaching a class prefix are, in fact, sentences. Hence, P-domain processes take place as predicted by our theory.

There are other instances which historically must have been formed in this manner, but have since been reanalysed as nominal stems. In (65) below we have two such items.

- 65(a) setímámóllo Pentanisia variabilis
 (b) sepótámólala neck meat

The items in (65) are indeed extremely crucial for our analysis. What these items show is that while it is true that there is a productive process of forming noun-like sentences by attaching a class prefix to phrases, it is also true that this process can be followed by a historical process of restructuring. The items in (65) can be shown to derive from the phrases *tímá mollo* and *pótá molala*, respectively. But, unlike the structures which are formed by attaching the class prefix to a phrase, no Mosotho can easily relate the connection between the phrase and its synthetic meaning. The phrases have since been reanalysed as STEMS. Consequently, each of the verb STEMS have a multiply-linked H which obviously spreads one mora to the right within a P-word domain. Hence, the class prefix of the erstwhile object has a H tone. These examples, therefore, do not contradict our claim that when class prefixes are attached to sentences or phrases in Sesotho, noun-like sentences or gerunds are formed.

We conclude this section of our research by making the following observations:

- (a) membership of the nominal paradigm can be increased by compounding (at least two different STEMS combining as one STEM), by derivation (taking a ROOT for a non-nominal and attaching derivational morphemes to license the ROOT to

be dominated by nominal STEM), by attaching class prefixes to VPs and thereby creating gerunds that have the same distribution as nouns.

(b) Tone rules proposed for non-derived nouns apply without any exception. Derived nominals therefore confirm that our theory makes correct predictions.

6 Conclusion

There are several issues that flow from our discussion of the structure and tone of NPs. We will mention a few of them. Details will be discussed in the section of our research dealing with the summary and synthesis of the major theoretical insights flowing from this work.

First, the role played by the OCP in the grammar of Sesotho has been underscored. The OCP plays a role as a constraint for underlying representations, as a driving force for the application of several tone rules such as Right Branch Delinking, H Tones Fusion, H Tone Downstepping, Meeussen's Rule and M Toning. It will be shown in the section dealing with summary of the work that it is the OCP which makes the task of accounting for dialectical variation an easy one. Second, domains defined in terms of phonological hierarchy as in Selkirk (1980, 1984) and in Nespor and Vogel (1986) have allowed us to make significant generalizations about the behavior of tones in Sesotho. A grammar of Sesotho seem to need the syllable, the P-word domain and the P-phrase domain. The C-domain does not seem

to be relevant for nouns in Sesotho. However, it will be shown in Chapter 4 that the C-domain is motivated in Sesotho. These domains are reflected in the kinds of rules postulated for the grammar of Sesotho. Meeussen's Rule and RBD are P-word domain span rule. Downstepping is a juncture rule. H Insertion and Lengthening are P-domain limit rule, and lastly, M Toning is a P-domain limit rule.

Thirdly, the structure of the IP and NPs has also been revealed in this discussion. For instance, we have argued that spec of IP is a non-theta position. The inverted subject is base generated and is co-indexed with AGR in all tensed INFL sentences. Hence, the AGR and the NP have the same semantic reading as far as thematic roles are concerned. External theta role assignment is therefore VP internal. The NP which receives the external theta role moves to the spec of IP to receive Case from I. We did not deal with the details of these claims. However, it is predicted that a syntactic study which would address these issues with much depth would support our claims.

Concerning the structure of the NP, it is significant to stress that the words called 'qualificatives' by Doke are Chomsky-adjoined when following the head noun. However, if these words precede the head noun, they obligatorily need the head noun for their sense to be complete. The head noun may follow them or be understood in the context. Because of the AGR element in the 'qualificatives' the noun is easily recoverable. That is, when 'qualificatives' precede the

head noun, they are in the spec of the NP. Among different structures which are possible for NPs, the one best suitable for Sesotho seems to be the one suggested by Abney. Abney proposes an NP structure that is headed by a Determiner. It is Abney's proposal which will make it possible for us not to have NPs without heads (Abney 1987).

The structure of the 'qualificative phrase' also needs to be mentioned. All 'qualificatives' are headed by a Particle. 'Qualificatives' are six in number: the adjective, the relative, the enumerative, the quantitative, the demonstrative and the possessive. The Particle is not part of the 'qualificative' as has always been assumed in Dokean grammars.

The last element that can be a constituent of the NP is the so-called Independent Pronoun (pro). (Doke calls this an Absolute Pronoun). In Dokean grammars, the assumption is that an Independent Pronoun (pro) under the NP node in the spec of I is used to contrast the head noun with yet another noun elsewhere in the sentence. This seems intuitively true. However, for our purposes we need to stress that an Independent Pronoun (pro) in this position is P-governed by the head noun. We know that specifiers P-govern their heads. Hence, we have reason to believe that the NP followed by a pro is in the spec of IP. Given the fact that the spec of IP is usually occupied by one NP, where then is the second NP dominating the pro? Our claim is that one NP is Chomsky-adjoined to the IP. That is, we have two NPs in

the spec of IP. The pro is dominated by the inner NP and co-indexed with the higher NP. This type of configuration makes it impossible for the Binding Conditions to be violated because the Chomsky-adjoined NP is outside the Governing Category of the NP dominating the pro. In (66) below we have a sentence that illustrates this.

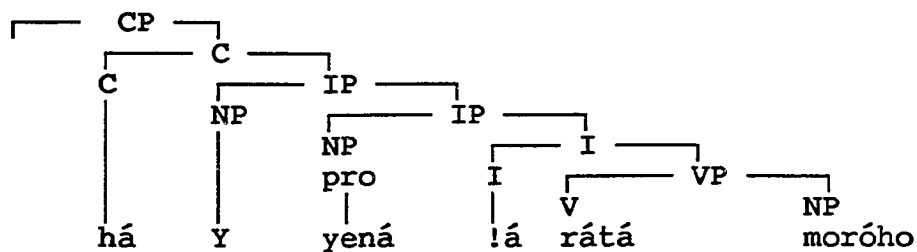
66 X ó rătă nama há Y yená !á rătă moróho.

X AGR like meat while Y pro AGR like vegetables.

X likes meat while Y likes vegetables

A diagram in (67) vividly demonstrates the structure.

67 ha Y yená !á rătă moróho



We know that both Y and yená are not getting the theta role from the VP because the AGR is tensed. They each can be moved to occupy some position within the VP. We will come back to these structures in the concluding remarks of the research. We just want to stress that it is tonological evidence that has convinced us about the structures as in (67).

CHAPTER 4

Tone and Structure of VPs

1 Introduction

In this section of our thesis we analyse the structure and the tone of the VP in Sesotho. The analysis will be based on the same principles and rules as those used for the analysis of NPs. We begin our analysis by identifying tonal problems typical in VPs. We use the present tense indicative to facilitate this discussion. But, before we discuss the present tense indicative, we will briefly discuss tonal patterns typical of the verbs in the infinitive form of a verb in the affirmative or positive conjugation. The negative will be analyzed in Chapter 5. There are four types of verbs which we regard as vital in illustrating the tonal patterns for verbs in Sesotho. The first type is the monosyllabic verb as in (1) below. (1a) is for a H-toned verb and (1b) is for a toneless verb.

1(a) Hoo já to eat

INF eat

(b) Hoo tswa to go out

INF go out

In both (1a) and (1b) the infinitive prefix hoo is L-toned and lengthened. We, therefore, assume that it is underlyingly toneless. In já (1a) we notice that the verb is preceded by the toneless infinitive prefix and is H-toned. Since there is no H tone on the preceding syllable, the H tone on já (1a) should be underlying. In tswa (1b)

the verb is L-toned. It is also preceded by the toneless infinitive prefix *hoo*. There is, consequently, reason to believe that this verb is underlyingly toneless.

In (2) we have examples of disyllabic verb stems. In *ráata* (2a) the verb has a H tone on the first syllable. The infinitive prefix is L-toned. Since *ráata* (2a) surfaces with a H tone on the first syllable and is not preceded by a H-toned clitic, we conclude that it is underlyingly H-toned. The H tone which surfaces on the first syllable should be a characteristic feature of the verb. In *baatla* (2b) the verb has a L tone on all syllables. The infinitive prefix is L-toned. Since *baatla* (2b) surfaces with L tones on all syllables, we conclude that it is underlyingly a toneless verb. In other words, tonelessness is a characteristic feature of this verb.

2(a) Ho *ráata* to like

INF like

(b) Ho *baatla* to want

INF want

The infinitive prefix has a short vowel in (2). The penult syllable of both the verb *ráata* (2a) and the verb *baatla* (2b) is long. Long vowels are thus predictably on the penultimate syllable. In (1) the penultimate syllable is the infinitive prefix whereas in (2) the penultimate syllable is part of the verb because the verb has more than one syllable. We conclude therefore that the vowel of the infinitive prefix is not underlyingly long. We believe that

in (1) it is lengthened because it is the penult syllable.

Also, we recall that in Chapter 2 we discussed disyllabic nouns. The tonal pattern of disyllabic nouns is the same as the tonal pattern of disyllabic verbs. A noun like *póodi* (goat), for instance, has the same tonal pattern as the verb *ráata* (2a). A verb like *baatla* (2b) has the same tonal pattern as the nominal stem in *molala* (neck).

In (3) below we have examples of a H-toned trisyllabic verb and a toneless trisyllabic verb. The infinitive prefix is still toneless. Since the infinitive prefix is toneless, there is no reason to expect the H tone of the verb *rékíisä* (3a) to be a consequence of the influence of a preceding H tone. The verb *rékíisä* has a sequence of H tones and a M tone, however. The verb should therefore be underlyingly associated with a H tone. In *paqaama* (3b) all the syllables of the verb are L-toned. Hence, we conclude that the verb is underlyingly toneless.

3(a) Ho *rékíisä* to sell

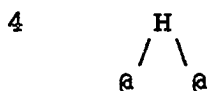
INF sell

(b) Ho *paqaama* to lie down

INF lie down

(3) compared with (2) above shows that the verb does not only surface with a H tone on the first syllable in *rékíisä* (3a) but the second syllable also surfaces with a H tone. In (2a) the second syllable does not surface with a H tone. We attribute this H tone that suddenly surfaces on the second syllable in (3a) to the spreading of the H tone

on the first syllable. We have reason to believe it is the spreading of a H tone because our discussion of the nouns has shown that once the target is within the P-phrase, the spreading of the H tone occurs. Within the P-phrase there is always a TBU immediately after the target. Spreading does not, however, occur when the target is at the end of P-domain as in *réeka* (2a) or in the noun *póodi*. In *rékíisä* (3a) spreading has to take place because there is an extra syllable after the target as is the case with trisyllabic nouns such as *lehéháadi*. We repeat the formulation of the spreading rule (HTS) in (4) below.



The last verb to be discussed for the infinitive is a four syllabic type of verb as in (5a) for H-toned verbs and (5b) for toneless verbs.

5(a) Ho kgúru-meetsa to cover

INF cover

(b) Ho kgarameetsa to push

INF push

Once again the infinitive prefix is L-toned. In *kgúru-meetsa* (5a) the first syllable surfaces with a H tone and the second syllable also surfaces with a H tone. We ascribe the second H tone to the spreading of the H tone on the first syllable. The first syllable acquires a H tone by rule (6) Initial High Tone Association which links the first syllable of all H-toned verbs with a floating H (Goldsmith

1990, Pulleyblank 1986). In *kgarameetsa* (5b) the verb and the infinitive are both L-toned. The verb is therefore underlyingly toneless.

To show that the claim about the availability of a TBU after the target is valid we could reduplicate the monosyllabic verbs and the disyllabic verbs in (1) and (2) respectively. In (6a) we have an example of a reduplicated H-toned monosyllabic verb and in (6b) a reduplicated toneless monosyllabic verb. In (7a) we have an example of a reduplicated H-toned disyllabic verb and in (7b) a reduplicated toneless disyllabic verb.

6(a) Ho jáéejä to eat a little

INF eat-REDUP

(b) Ho tswaeetswa to go out a little

INF go-REDUP

7(a) Ho rátáraata to like a little

INF like-REDUP

(b) Ho batlabaatla to want a little

INF want-REDUP

We notice that the H tone on the monosyllabic verb *já* spreads one mora to the right in (6a) because the stem is extended by reduplication. We also note that there is an epenthetic default vowel *e* between the first monosyllabic verb stem and the second verb stem in (6). In *jáéejä* (6a) the epenthetic vowel is H-toned and long. In *tswaeetswa* (6b) the epenthetic vowel is L-toned and also long. We therefore attribute its H tone in (6a) to the preceding H

tone on the first syllable of the monosyllabic verb.

In Sesotho the reduplicant has a foot which is strictly binary. In other words, the reasons behind the epenthesis is to satisfy Minimality Condition. Reduplicating any constituent which has fewer than two syllables is therefore ill-formed in Sesotho. Hence, a default front vowel is inserted to satisfy the requirements for Minimality Condition. Recall our discussion of the nouns in Chapter 2 where pronunciations of nouns in class 9 are also constrained by the Minimality Condition.

The point about examples (6) and (7), however, is not to demonstrate reduplication as such. The point is to show that the spreading of a H tone one mora to the right is always possible within a P-domain. That is, the H tone on the first syllable of these verbs spreads one mora to the right as soon as more TBUs are available to satisfy the structural description for HTS. This is exactly what happens in *jáéejä* (6a) and in *rátáraata* (7b). A H tone on the first syllable spreads one mora to the right as soon as more toneless TBUs are available. We noted the same tonal behavior in our discussion of the nouns in Chapter 2.

In *jáéejä* (6a) we also note that the last syllable of the reduplicant surfaces with a M tone just as the last syllable of the trisyllabic verb *rátíisä* (3a) surfaces with a M tone. We noted the same pattern in our discussion of monosyllabic noun stems that are extended by augmentative or femininity suffix *hadi* as in *lehéháadī*. We argued that the

M tone was a consequence of a H Tone Insertion which applies at the end of a P-domain. Since the facts about this M tone on the verbs are so identical with those for nouns, we conclude that the analysis we gave for nouns should hold for this M tone as well.

There is something else crucial about the forms in (6) and (7). This is the lack of a H tone on the first syllable of the reduplicant. This is clearly demonstrable in (7a) where the verb *ráta* surfaces without a H tone on the first syllable. In the case of *jáéejä* (6a) it is not obvious that the second *ja* after the default vowel *e* is also without a H tone. The situation is blurred by the processes that produce the M tone. However, as was shown in our analysis of the M tone in Chapter 2, the verb in that position is toneless at the point where the H Tone Insertion rule applies. That this is true can be illustrated by comparing (6a) with (7a). (7a) is crucial because it shows that each syllable is not underlyingly associated with a specific tone. The verbs that surface with a H tone on the first syllable must get that H tone by a rule. In other words, the H tones are floating over the verbs. If they were not floating as was the case with tones associated with syllables of the nouns, the first syllable of the second *rata* in *rátáraata* (7a) would also surface with a H tone. So, H-toned verbs acquires a H tone on the first syllable by a rule which links the first syllable with a H tone. We know that it is the first syllable on the left because it is

the first syllable that always surfaces with a H tone in all examples involving H-toned verbs. This rule is often called the Initial High Tone Association Rule. It is formalized in (8) below.

$$\begin{array}{c} 8 \text{ [Co V} \\ \quad | \\ \quad \text{H} \end{array}$$

It is this rule which associates the floating H tone with the first TBU of the first syllable on the left of a H-toned verb.

The behavior of the H tone on the H-toned verb as in (8a) during reduplication is the same as discussed for the disyllabic verb. In other words, the first two syllables of the verb are placed in front of the full verb stem. The Initial Association Rule (8) links the floating H tone with the first syllable and the H tone on the first syllable spreads one mora to the right. The rest of the reduplicated verb stem remains L-toned. This is illustrated in (9) below.

$$\begin{array}{c} \text{H} \\ | \quad \backslash \\ 9(a) \text{ Ho } \text{kgurúkgurumeetsa} \quad \text{to cover a little} \\ \text{INF cover-REDUP} \\ \\ (b) \text{ Ho } \text{kgarakgarameetsa} \quad \text{to push} \\ \text{INF push} \end{array}$$

Examples in (9) demonstrate the advantage of an autosegmental analysis over a linear analysis. In linear analysis the lack of the H tone on the first syllable of the *kgurumeetsa* part of the reduplicated verb stem

kgúrúkgurumeetsa would have to be explained in terms of some deletion because the linearity principle would make it impossible for the tone to be separated from its segment. Since tones are in their tier in our analysis, what happens on the skeletal tier does not have to affect the tonal tier. So the second kgurumetsa does not get a H tone because it is no longer initial. It is the initial syllable which attains a H tone by Initial High Tone Association Rule.

Before we complete our discussion of the tonal patterns of the infinitive verb, it might be illuminating to make a derivation. This derivation will be a summary of the observations which we have thus far made. Firstly, it will show how the Initial H Tone Association Rule interacts with other rules. Secondly, the infinitive is like a noun in isolation. As a result, it is easy to demonstrate the parallels between the noun and verb by using the infinitive verb. Let us refer to (10) below to illustrate.

10	H	H	
	ho-reka	ho-rekisa	UR
	H	H	
	ho-réka	ho-rékisa	IHT Ass
	ho-ré<ka>	-----	Extratonicity
	-----	ho-rékísa	HTS
	-----	-----	RBD
	-----	-----	Meeussen's Rule
	-----	ho-rékísá	H T Insertion
	ho-réeka	ho-rékiísá	Lengthening
	-----	-----	Downstepping
	hò-réèkà	hò-rékiìsá	Default Rules
	-----	hò-rékiìsä	M Toning
	[hò réèkà]	[hò rékiìsä]	PR

The derivation in (10) above succinctly captures the following generalizations about the infinitive verb:

(a) the tonal structure of an infinitive verb is the same as the tonal structure of a noun in isolation. For instance, a disyllabic H-toned verb is the same as a noun whose first syllable is H-toned and the second syllable is toneless because the last syllable in both the noun and the verb of this type is extratonic at the end of P-domain. Compare the derivation for *póodi*. Also, a trisyllabic verb is the same as a trisyllabic H-toned noun because their last syllable is free to acquire a H tone by the H Tone Insertion Rule at the end of P-domain. Recall

lehéháadi.

(b) H tones spread one mora to the right as they do with nouns. Syllables are not, however, associated with specific tones in the underlying structure of verbs. H tones are just floating on the verbs. These H tones associate by a rule, namely the IHT Association Rule.

These generalizations are important because they further strengthen our analysis of the nouns in Chapter 2. Since we know that words in isolation are different from words in context, we will use the verb stems in the infinitive in different tenses and modalities. This will enable us to establish the different tonal modifications typical of the verbal complex.

2 The Present tense indicative

In Khoali (1990) it is argued that the present tense has two forms: the form where the verb is Case-assigning and the form where the verb is not Case-assigning. (11) below is a sentence where the verb is Case-assigning while (12) is an example of a sentence where the verb is not Case-assigning.

11 Thabo ó ráatá p!óodi.

Thabo AGR like goat

Thabo likes a goat

12 Thabo ó ya ráatä.

Thabo AGR CA like

Thabo likes (it that way).

In (11) the verb selects the NP and therefore Case-assigns it. The tonal pattern of the verb is HH. This HH tonal sequence (indicating spreading) has been argued to be a signal for a constituent which P-governs another constituent. That is, the verb with a HH tonal sequence in (11) P-governs the NP. The FM tonal sequence has been argued to be a signal for constituents which are at the end of a P-phrase. That is, a FM tonal pattern signals that a constituent does not P-govern anything. Hence, in (12) the verbal head does not P-govern anything. The verbal head is at the end of a P-phrase. In (12), the Case Absorber *ya* absorbs the Case-assigning properties of the verb. Hence, the verb does not select any constituent. The syntactic evidence that the verb does not select any constituent in (12) is additional evidence supporting the fact that the FM tonal pattern is a signal that the verb does not P-govern anything. In short, the FM tonal pattern indicates that the verb is at the end of a P-phrase.

We are reminded of our discussion of the NP in Chapter 2 where we have argued that a disyllabic nominal head which P-governs another constituent has either a HH tonal pattern or a HL as in *pódí* or *mosádi* respectively. If the nominal head does not P-govern any constituent, however, the head has either a FL tonal pattern or a FM as in *póodi* and *mosáadi* respectively. That is, there is a correlation between the tonal patterns for nouns and the tonal patterns for verbs.

This suggests that syntactic contexts where the verb is characterized by either a FL or a FM are additional to those syntactic contexts where the noun is characterized by either a FL or a FM tonal pattern. In nouns, the syntactic contexts are the cases where the noun is qualified by 'qualificatives'. In verbs, on the other hand, the contexts are those where the Case-assigning properties of the verb have been absorbed by *ya*. The tonal pattern for verbs in this syntactic context is a FM one. The question is: is the FM the only signal for ends of P-phrases in verbs?

We will argue that the FM tonal pattern is not the only signal for the ends of P-phrases within the VP. We will argue that the FM signal occurs when the verb is marked by a Case Absorber *ya*. It follows that the syntactic evidence that the verb marked by *ya* is not Case-assigning is independent evidence that the verb should be at the end of a P-phrase. In other words, a verb marked by *ya* is obligatorily marked by a FM tonal pattern because it is at the end of a P-phrase. Constituents that follow such a verb are all Chomsky-adjoined. Hence, the FM tonal pattern is a signal that any constituent to the right of the verb is not in the same P-phrase as the verb that precedes it. The constituent is not P-governed by the verbal head.

In (13) below we demonstrate the case of the verb being followed by a PP with its tonal pattern being HLL. In (14) the verbal head is marked by the Case Absorber *ya*. Hence, the verb is characterized by a FM tonal pattern. In each

case the constituent that follows is a PP in the form of a by phrase. In (13) it is not obvious that the PP is Chomsky-adjoined, because there is no independent syntactic evidence to support this view. In (14), on the other hand, the PP is obligatorily Chomsky-adjoined. All these are signalled by the tone as well as by the presence of the Case-Absorber *ya*. We will demonstrate in due course that the presence of an object prefix in the verbal complex is yet another syntactic evidence to illustrate that the constituent is Chomsky-adjoined.

13 Thabo ó ráat-w-a ké baatho.

Thabo AGR like-PASS-a by people

Thabo is liked by people.

14 Thabo ó ya ráatwä ké baatho.

Thabo AGR CA like-PASS-a by people

Thabo is liked by people.

It is generally accepted that the by phrase is an adjunct. The verb in (13), however, selects the by phrase as can be shown by the ungrammatical sentence in (15) below where the by phrase has been left out.

15 *Thabo ó ráatwa.

Thabo AGR like-PASS-a

Thabo is liked

In other words, the passive verb needs the by phrase for it to make sense. Hence, the sentence without the by phrase is ungrammatical. However, when sentence (14) is used without the by phrase, it is still acceptable as in

(16) below.

16 Thabo ó ya ráatwä.

Thabo AGR CA like-PASS-a

Thabo is liked.

If the verb in (13) selects the *by phrase*, what is the difference between (13) and (17) below? In (17) the tonal pattern of the verb is HH. This tonal pattern indicates that the verb P-governs the *by phrase*.

17 Thabo ó rátwá k!é batho.

Thabo AGR like-PASS-a by people

Thabo is liked by people

Both in (17) and in (13) the verb selects the *by phrase* as can be shown by the ungrammaticality of (18) where the sentence in (17) is used without a *by phrase*.

18 *Thabo ó rátwá.

Thabo AGR like-PASS-a

Thabo is liked.

As a result, both (15) and (18) indicate that their verbs need complements to make sense. The difference between (15) and (18) is in tonal pattern. ráatwa (15) is HLL while rátwá (18) is HH. Since the verbs in (13) and in (17) both select the PP (*by phrase*), could it be that these examples are instances of tonal free variation?

We will argue that the HLL and the HH are not free variants in the sense that they are predictable. While both verbs select the PP, the PP that follows the ó ráatwa (15) is Chomsky-adjoined while the PP that follows the ó rátwá

(18) is not Chomsky-adjoined. That is, we assume that selected constituents can either be sister to the head or be Chomsky-adjoined. This assumption is consistent with the tonal behavior for nouns. We argued in Chapter 2 that nouns which are modified by 'qualificatives' are characterized by either a FL or a FM tonal pattern. This means that the FL tonal pattern characterizing the verbs *ó ráatwa* (15) and the verb *ráatwā* (16) are typical patterns for words which are at the right edge of a P-domain. We argued that nouns with these tonal patterns are followed by Chomsky-adjoined constituents. Hence, we conclude that the verbs with a FL and FM tonal patterns are also followed by Chomsky-adjoined constituents. In terms of the prosodic rule proposed in Chapter 2 (Rule) we conclude that there is a P-phrase boundary between a verbal head with a FL and a FM tonal pattern.

Additional evidence that the PP (the by phrase) in (13) is Chomsky-adjoined can be found in (19) where the verb with a FL cannot be followed by an NP because the NP cannot be adjunct. It should be sister to the verbal head.

19 *Thabo *ó ráatwa pháatla*.

Note in (19) that the object NP *pháatla* begins with a H-toned syllable. Also, compare (19) with (20) where the same sentence in (19) is grammatical. The difference is only in tonal patterns because in *ráatwa* (19) the tonal pattern is HLL while in *rátwā* (20), on the other hand, the tonal pattern is HH.

20 Thabo ó ráat-w-á ph!áatla.

Thabo AGR like-PASS-a personality

Thabo 's personality is likeable

On the basis of (19) and (20) there is reason to conclude that the HH tonal pattern has something to do with sisterhood syntactically. Disyllabic H-toned verbs are signalled to be P-governing their governees by a HH tonal pattern while H-toned disyllabic verbs which are selected but Chomsky-adjoined are characterized by a HLL tonal pattern.

Another point worth mentioning at this point is that the verb ráatwa is a H-toned verb as shown by the fact that it always surfaces with a H tone on the first syllable. In ó ráatwa (18) the H tone on the first syllable of ráatwa may be confused with a H tone that surfaces when a H-toned subject prefix precedes a toneless verb as in (21) below.

21 Thabo ó bátlwa botho

Thabo AGR want-PASS-a personality

Manners are demanded of Thabo

In (21) the first syllable of the verb batla surfaces with a H tone because there is a H-toned subject prefix preceding it. If the subject prefix is toneless as in (22) below, the verb surfaces with a L tone.

(22) Wena o batlwa botho

You AGR want-PASS-a personality

Manners are demanded of you

These data show that the H tone on the first syllable

of verbs may either be a result of the H tone on a preceding syllable as in (21) or the result of a H tone which is characteristic of the verb itself as in (13), (14), (16) and (17) above. Consequently, verbs like *ráatwa* are underlyingly associated with a H tone because they always surface with a H tone on one of the syllables at least. Verbs like *batlwa*, on the other hand, are toneless because they surface with a H tone only when they are preceded by H-toned subject prefixes.

Examples (21) and (22) also show that some subject prefixes are H-toned as in (21) and others are toneless as in (22). It is important to note that each tense in a modality is characterized by a subject prefix. It follows that tonal characteristics of these subject prefixes differ from one tense to another.

Disyllabic verb stems are crucial because H tone spreading involves spreading a H tone one mora to the right. That is, the disyllabic verbs are the only verbs that provide enough syllables for the spreading rule. The remaining verbs will be introduced as we proceed with our discussion.

There are other interesting issues in the behavior of tones on verbs in Sesotho. For instance, if a monosyllabic verb stem as in (23) P-governs another constituent and the AGR is H-toned, the verb stem and the AGR are pronounced with a level H tone. This level H tone is also typical even in cases where the verb stem is toneless as in (24).

23 Thabo ó já nama

Thabo AGR eat meat

Thabo eats meat

24 Thabo ó tswá boladu

Thabo AGR come out puss

Thabo oozes puss

However, if the verb does not P-govern the constituent to the right, the H-toned verb as in já (25) surfaces with a H tone whereas the toneless verb as in tswa (26) surfaces with a M tone.

25 Thabo ó yaa já Thabo eats.

Thabo AGR CA verb

26 Thabo ó yáa tswā Thabo goes out.

Thabo AGR CA go out

Once again the FM tone as in (26) signals that the verb does not P-govern anything. In (25) the verb já remains H-toned. Yet, we also notice that there is difference between a H-toned monosyllabic verb marked by a Case Absorber ya and a toneless verb marked by ya. In the case of the toneless verb, the H tone of the subject prefix surfaces one mora to the right whereas in the case of the H-toned monosyllabic verb, it does not surface one mora to the right. This means that we do not have a penult which is H-toned in the case of H-toned monosyllabic verbs. In the case of the toneless monosyllabic verb, we have a penult which is H-toned. Consequently, the final syllable of the toneless monosyllabic verb surfaces with a M tone. That is, in the

case of the H-toned monosyllabic verb RBD decreases the chances for the application of the M Toning Rule because the penult syllable is blocked from acquiring a H tone.

H-toned trisyllabic verb stems show that their last syllable surfaces with a M tone if the verb does not P-govern any constituent as in (27). If it P-governs another constituent as in (28), however, its last syllable is always L-toned.

27 Thabo ó ya rékíisä Thabo sells
 Thabo AGR CA sell

28 Thabo ó rékísa naama Thabo sells meat
 Thabo AGR sell meat

A toneless trisyllabic verb preceded by a H-toned subject prefix as in (29) is characterized by a H tone on the first syllable if the verb P-governs another constituent. If the verb does not P-govern any constituent as in (30), however, it surfaces with L tones on all syllables. It is the Case Absorber *ya* between the H-toned subject prefix and the toneless verb stem that surfaces with a H tone.

29 Thabo ó páqama peere Thabo lies on the horse
 Thabo AGR lies horse

30 Thabo ó yá paqama Thabo lies down
 Thabo AGR CA lies down

The facts for trisyllabic H-toned and toneless verb stems hold true for verb stems with more than three syllables as in (31) for H-toned ones and (32) for toneless

ones.

31 Thabo ó kgúrúmetša mootho Thabo covers a person

Thabo AGR cover person

32 Thabo ó kgárametša mootho Thabo pushes a person

Thabo AGR push person

In (31) the H tone on the subject prefix ó and the H tone on the verb kgúrúmetša are pronounced at the same pitch. The same is true for the example in (32) where the pitch of the subject prefix is maintained at the same level as that of the first syllable of the toneless verb stem. In other words, a toneless verb stem suddenly acquires a H tone when preceded by a H-toned subject prefix. If the subject prefix is toneless as in (33), however, the verb alone will have a H tone if it is H-toned as in (33a). If the verb is toneless, nothing surfaces with a H-tone as in (33b).

33(a) O kgúrúmetša motho You cover a person

AGR cover person

33(b) O kgarametša motho You push a peson

AGR push person

H-toned four syllabic verbs that do not P-govern other constituents as in (34) surface with a H tone on the first two syllables. The Case Absorber ya is L-toned even if the subject prefix is H-toned as in (34a) for a H-toned subject prefix and (34b) for a toneless subject prefix.

34(a) Thabo ó ya kgúrúmeetsa Thabo covers

Thabo AGR CA cover

(b) Wena o ya kgúrúmeetsa You cover

You AGR CA cover

Toneless four syllabic verbs that do not P-govern any constituent as in (35) surface with L tones. If the subject prefix is H-toned as in (35a), the Case Absorber ya also surfaces with a H-tone. If the subject prefix is toneless as in (35b), the Case Absorber ya surfaces with L tones.

35(a) Thabo ó yá kgarameetsa Thabo pushes

Thabo AGR CA push

(b) Wena o ya kgarameetsa You push

You AGR CA push

In other words, as soon as the syllables go beyond three, there is no significant difference in terms of tonal cues for the verbs. A H-toned quadrisyllabic verb is signalled in the same way as a H-toned trisyllabic one and a toneless quadrisyllabic verb is signalled by the same tonal cues as a toneless trisyllabic one.

We conclude our presentation of the tonal behavior of the verb in the present tense indicative by making the following observations in (36) below:

36(a) verbs can be divided into two groups namely

H-toned verbs and toneless ones

(b) subject prefixes can be divided into two groups, namely H-toned subject prefixes and toneless ones

(c) the Case Absorber ya is toneless

(d) the H tone of the H-toned subject prefixes spreads one mora to the right. The spreading H tone targets all toneless TBUs, be they clitics like the Case Absorber ya or STEMs

(e) the Case Absorber ya does not surface with a H tone if there is a H-toned syllable immediately after the targeted TBU

(f) all H-toned disyllabic verbs marked by the Case Absorber ya surface with a M tone on the last syllable

Having made all these observations regarding verbs in the present tense indicative, the question could be asked how they could be accounted for in a principled manner. We give the account in section (2.0) below.

2.0 Assimilation and Dissimilation in the Present Tense Indicative

We have noted that there is a similarity in the tonal behavior of nouns and verbs. We assume that the analysis which we have adopted for nouns could be extended to verbs. Consequently, we recapitulate the principles on which the analysis for nouns has been based as a prelude to our analysis of the verbs. Specifically, the rules in (37) below are a summary of the rules needed to account for tonal alternations in Sesotho.

37(a) H T S. This rule is W-domain, C-domain and P-domain span rule. The rule involves a H tone spreading one mora to the right. The noun should not be at the end of P-phrase.

- (b) Meeussen's Rule. This rule applies only in the W-domain. This rule involves deletion of the second H tone preceded by another H tone within the W-domain.
- (c) Extratonicity Rule. This rule makes the right edge of a P-domain extratonic. This means that a final toneless mora of a noun with a H-toned penult is made invisible to the spreading H tone.
- (d) High Tone Fusion. This rule merges a H of the a specifier with the H tone on the first syllable of the verb stem.
- (e) R(ight) B(ranch) D(elinking). RBD. This is a disassociation of the right branch of a multiply-linked H tone if, and only if, there is a H tone immediately after the target.
- (f) Spec H Delink Rule. This rule delinks the H tone on a reflexive prefix or object prefix if it is not within the same phonological word as the H tone of the STEM.
- (g) H Tone Insertion. A H tone is inserted on the last syllable if, and only if, there is a H tone on the penult syllable in a word that is at the right end of P-phrase.
- (h) Penultimate Lengthening. This rule involves the addition of a mora on the penultimate syllable of the word at the right edge of the P-phrase.

- (i) High Tone Downstepping. If two H tones on different constituents within the P-domain are adjacent, then the H tone on the right is downstepped. The count is from left to right in a line.
- (j) M Toning. This rule lowers the pitch of the singly linked H on the last syllable preceded by a syllable that has a Falling (F) tone (H and L on one syllable). The lowered H tone surfaces as a M tone.
- (k) Default Rules. All toneless moras are given a L tone by this rule.

Firstly, extratonicity is the rule which is intended to explain the reason why the H tone does not spread when H-toned nouns such as *póodi* are at the end of a P-phrase. We posited the rule in the discussion of the tonology of nouns in Chapter 2. We argued that in nouns such as *póodi* the H tone does not spread because the last syllable is extratonic at the end of a P-phrase. This explanation could be extended to cover the infinitive verb where a H tone on a disyllabic H-toned verb does not spread one mora to the right at the end of a P-domain.

In our introductory remarks in this chapter we have illustrated that there are different tonal cues which the language uses to signal structural relations between constituents. We have demonstrated that tonal cues on verbs are same as those of nominal heads. Nouns signal that they do not subcategorize for modifiers or 'qualificatives' by either a FL or a FM tonal pattern. Verbs, on the other

hand, signal that they do not subcategorize for any constituent by the presence of the Case-Absorber *ya* or the the object prefix. In addition, H-toned verbs are also capable of selecting constituents which may or may not be sister to them. Hence the FM tonal pattern is strictly a signal for a verb which is at the end of a P-domain. The FL (HLL) tonal pattern of verbs signals that the verb subcategorizes for a constituent although the constituent is Chomsky-adjoined. That is, FL tonal sequence alternates with a FM tonal pattern in certain prescribed syntactic contexts. In addition, in other syntactic contexts we find a HH tonal pattern. These HH are cases where the structural relation between a verbal head and the constituent that follows it is that of sisterhood.

How do we account for these alternations? Firstly, the F tone could be accounted for by simply assuming that the Lengthening Rule has applied at the end of a P-domain. We recall that Lengthening occurs on all words which are at the right edge of every P-phrase. The penult of every word which is at the right edge of a P-phrase is always long in Sesotho. A verb with a FL tonal type is at the right edge of a P-domain. Hence, by the penult of the verb getting an additional mora, we end up with a HL sequence on one syllable. This HL sequence is the one that results in a F tone. We therefore propose that a FL sequence should be analysed as a verb which is underlyingly H-toned. The second syllable is extratonal at the end of a P-domain.

This means that verb in (38) below is at the end of a P-phrase.

(38) Ke ráata há l!é tsámaya. I like it when you leave
 AGR like when AGR leave

We have demonstrated that the verb is at the end of a P-domain in our introduction. In (39) below, however, we need to reiterate that the verb is not at the end of P-domain. The verb P-governs the constituent which follows it.

(39) Ke rátá h!á l!é tsámaya. I like it when you leave
 AGR like when AGR leave

In (39) the verb selects the constituent which follows it even though the constituent is Chomsky-adjoined. In (38), however, the verb selects the constituent and the constituent is sister to the verbal head. This means that a FL tonal sequence is associated with the ends of P-phrases. We also cannot use the H tone after the target as the explanation for the L tone because (38) is an immediate counter-example. We refer to this possibility because it could be argued that the FL is a result of RBD. That is, the right branch of the spread H tone delinks because there is a H tone immediately after the target. Decisive evidence to show that it is not RBD can be advanced by giving an example of a complement whose initial word is toneless as in (40) below.

40 Ke ráata hahóló ho tsamaya I like a lot to go
 AGR like too much to go

In (40) the adverb hahóló begins with a L tone. If we

accept that this adverb begins with a L tone, the structural description for RBD is not met. Hence, RBD cannot take place in this phonetic environment. RBD has been shown as a response to the violation of the OCP in all cases demonstrated thus far. Consequently, the FL tonal sequence as in ráata (40) cannot be explained in terms of RBD.

The example in (40) is decisive because the constituent after the verb is an adverb. Adverbs of manner are more acceptable in Chomsky-adjoined positions than in sisterhood positions. Since adverbs are Chomsky-adjoined in Sesotho, they are in a separate P-domain from the domain of the verbal head. This can be shown conclusively by the fact that a H tone on the first syllable of an adverb preceded by a H tone of a H-toned monosyllabic verb does not downstep as in (41) below.

41 ke já kápelé h!á k!é báatlä.

AGR eat fast when AGR want

I eat fast when I want

In (41) the H tone on the verb stem já is adjacent to the H tone on the first syllable of the adverb. If these H tones were adjacent within the same P-phrase, the second H tone would downstep as a repair strategy for the violation of the OCP. The H on the ká of kápelé does not downstep because the verb stem is in a different P-phrase from the P-phrase for the adverb. This is correctly predicted by the theory which we have proposed for the nouns. We know that at the juncture between two P-phrases, no Downstepping takes place.

This implies, crucially, that the algorithm for creating P-domains which we proposed in Chapter 2 is correct because immediately after a verbal head with a FL or FM a phonological boundary would be inserted. (42) below is the formulation of the rule.

42 Insert phonological phrase boundaries at the right end of a head followed by a Chomsky-adjoined constituent or otherwise at the extreme right edge of an x^{max} .

Hence, we predict that constituents such as NPs which, in terms of the Case Filter, need Case are always within the same P-domain as the verbal head. Such constituents as NPs can only acquire Case in a sisterhood position. Those that do not require Case such as PPs and Ss are in the same P-domain as the verbal head only if they are sister to the verbal head. This means that P-domains are defined in terms of structure only.

We prefer to deal with problems concerning these data by extratonicity because it is consistent with our analysis. Firstly, this proposal excludes the possibility of additional tone rules. We know that the last syllable is extratonic at the end of P-domain. We therefore expect that there will be no spreading of the H tone in that situation. On the other hand, we expect that those situations where the verbal head is within the P-domain, the H will, accordingly, spread one mora to the right.

The rule in (42) does not solve all our problems,

however. It does not tell us why *réekä* in *ke ya réekä* should have a M tone on the final syllable while in *ho réeka* (to buy), it surfaces with a L tone. Extratonicity predicts only that the H tone will not spread one mora to the right when the last syllable is extratonic. In the case of *ke ya réekä* (I buy) the verb has to receive a H tone by H Insertion at the end of the P-domain. We know that the Case Absorber *ya* implies that the verb neither Case-assigns nor governs a constituent following it. If there is a constituent after a verb marked by *ya*, such a constituent is obligatorily Chomsky-adjoined. How do we block the H tone from being inserted into infinitive verbs and the ones that govern other constituents?

Regarding nouns we have explained the difference between FL and FM by arguing that extratonic syllables remain extratonic even with respect to the H Insertion rule at the end of the P-domain. That worked. If we follow that logic with verbs, we encounter problems, however. Firstly, how is the extratonicity rule to distinguish between those verbs that need to be extratonic as opposed to those that need to be free at the point where the H Insertion applies? Secondly, verbs have a floating H tone and therefore cannot be derived from a HH sequence as was done for nouns. Recall that this is, in essence, the point where the H0 nouns such as *póodi* differed from the HH nouns such as *mosáadi*. This suggests that once again we have a paradox.

For lack of any phonological explanation we appeal to

the syntax. We note that all disyllabic H-toned verbs marked by a Case Absorber *ya* surface with a M tone. If the *ya* is absent, these verbs surface with a L tone. Since we know that the M tone is the consequence of a H tone that is inserted at the end of P-domain, we try to derive the M tone from an inserted H tone. If we assume that, once the verb is marked by the Case Absorber *ya*, extratonicity is overridden, we could derive the M tone from an inserted H tone at the end of a P-domain. That is, if we assume that all verbs will be marked extratonic by an Extratonicity rule whose domain is reformulated in rule (42), we can explain why H-toned disyllabic verbs marked by *ya* always surface with a M tone.

Their last syllables acquire H tones by the H Tone Insertion Rule which applies at the end of P-domains. This H tone is further lowered in the environment of L tones inserted by default rules as discussed earlier. In short, by some stipulation we state that extratonicity is overridden by the H Tone Insertion if, and only if, the verb is marked by the Case Absorber *ya* in (43) below.

43 All final syllables of H-toned disyllabic verbs are freed of extratonicity if the verb is marked by a Case Absorber *ya* at the end of a P-domain.

However suspect the idea of a stipulation may be, the empirical facts are that all H-toned disyllabic verbs should be freed of extratonicity if they are marked by *ya*. The inserted H tone could therefore be viewed as an enhancer of

the fact that the head is unambiguously domain-final.

It is not only the Case Absorber *ya* that obligatorily demands that the verb be 'freed' of extratonicity at the end of the P-domain. Verbs that are marked for progression of the event by *sa* when these verbs do not P-govern other constituents also need to be 'freed' of extratonicity at the end of the P-domain. Examples of such verbs are in (44) below. (44a) and (44b) each have a H-toned disyllabic verb which does not P-govern other constituents whereas in (44c) and (44d) the verb P-governs the object NP. Both sentences are in the present progressive indicative.

- | | |
|------------------------|-------------------------|
| 44(a) Ke sá réekä | (b) ó sa réekä |
| AGR PROG buy | AGR PROG buy |
| I am still buying | He is still buying |
| (c) Ke sá réká nama | (d) ó sa réká nama |
| AGR PROG buy meat | AGR PROG buy meat |
| I am still buying meat | He is still buying meat |

The H-toned disyllabic verb *réekä* surfaces with a M tone in (44a) and (44b) just as verbs which are marked by the Case Absorber *ya* surface with a M tone. This suggests that a verb which is marked by the H-toned progressive marker *sá* should also override extratonicity at the end of the P-domain. We believe that the progressive marker is H-toned because it surfaces with a H tone if preceded by a toneless subject prefix such as *ke* (44a) and (44c). If the *sá* is preceded by a H-toned subject prefix as *ó* (44b) and (44d), the H-toned progressive marker surfaces with a L tone. We

attribute the L tone to Meeussen's Rule (ó sá= W-domain) which deletes the second H tone within a phonological word domain. We will come back to the details after illustrating that the verb marked by sá and ya have to override extratonicity at the end of the P-domain.

Having demonstrated that it is not only ya that requires that extratonicity be erased at the end of the P-domain, the question is: how do we capture this in a principled manner? There are perhaps several ways of dealing with this problem. We will, however, explore only two of them. Firstly, we can deal with this problem by proposing that there are two types of P-domains: a strong one and a weak one. Clements makes a similar observation for external sandhi in Ewe. He has strong pauses and weak ones (Clements 1978). The strong one we could call P-domain 1, the weak one merely P-domain. P-domain 1 would be the one that overrides extratonicity. P-domain would be the general one which applies in certain syntactic contexts even if those contexts did not have a ya or a sá. The domains would also have to be layered. That is, P-domain would have to be a subset of P-domain1, because that is the requirement of our hierarchical theory.

At a P-domain level extratonicity would hold for all final syllables preceded by a H-toned syllable. So, réeka in horéeka, in yaréekā or saréekā would all have the final syllable extratonic. This would also be true of the di in póodi. At P-domain1 level the H tone would be inserted into

those extratonal syllables whose verbs are marked by *ya* or *sá*. *Mosáadi* would not get a H tone because it is not marked by any of these markers and therefore would surface as **mosáadi*. The same would apply to toneless stems that derive a H tone from preceding particles as *lé móothö*. They would also surface with a L tone instead of a M tone as in **lé móotho*. The proposal is therefore unattractive because it does not predict correct results for some utterances in Sesotho.

The second way of dealing with this problem is to assume that extratonicity is erased before the H Tone Insertion rule applies at end of a P-domain. The environment for the erasure of extratonicity could be the *ya* and the *sá* as in (45) below.

45 < > -----> 0/ --]P (verb marked by *ya* or *sá*)

Rule (45) is desirable. The rule merely states that the extratonicity of all H-toned disyllabic verbs is deleted if these verbs are marked by *ya* or *sá*.

This rule is similar to the analysis Halle and Vergnaud give for English nouns that are systematic exceptions to Extrametricality. English nouns which are exceptions to Extrametricality are those with a long vowel on the final rhyme. Halle and Vergnaud capture this in a proviso in the rule for Extrametricality in English (Halle and Vergnaud 1987:233). The proviso makes the exceptions escape the effects of the Extrametricality rule. Rule (45) has the same effect because it removes extratonicity for all verbs

marked by *ya* or *sá* so that such verbs, like the English examples, could behave differently from other verbs. Recall that Extratonality is relevant to H-toned disyllabic verbs only.

The advantage of this approach over the one proposed earlier is that Extratonality is applicable to all words whose penultimate syllable is H-toned. The verbs marked by the *ya* or the *sá* are thus treated differently from the rest in that they further undergo the Extratonality Erasure Rule. It follows that Extratonality will block H tone spreading within the P-word for all relevant words. Nouns and unmarked verbs will not undergo the Extratonality Erasure rule. They will therefore have the last syllable invisible to H tone Insertion at the end of the P-domain. Those verbs whose Extratonality has been erased will be visible to H Tone Insertion at the end of the P-domain. Correct results will be obtained. We will demonstrate this in due course.

Besides the relationship between HTS and Extratonality as described above, there is the problem of spreading a H tone into the STEM. In Chapter 3 we have demonstrated that particle H tones spread to toneless class prefixes only. That is, class prefixes form a separate phonological word domain with the particles. If that analysis has to be maintained, we are obliged to analyze the spreading of a H tone from the H-toned particle (subject prefix) to the STEM as indicative of the fact that the subject prefix and the verb STEM are in the same phonological word or in a domain

that contains their phonological word domain. The domain is different from the domain comprised of the particle and the class prefix because the domain cannot be independent of the STEM. The domain should contain the STEM. The spreading of a H tone from the subject prefix is illustrated in (46).

46 ó bátla nama he wants meat

AGR want meat

We know that the verb stem *batla* is toneless. The subject prefix is H-toned. We have already demonstrated this. The examples are repeated in (47) for convenience only. Compare *o batla* (47) with *ó bátla* (46). The subject prefix is toneless in (47) while it is H-toned in (46). There is therefore no H tone surfacing on the first syllable of the toneless verb *batla* in (47).

47 o batla nama you want meat

AGR want meat

What is important in these examples is the fact that a H tone spreads into the STEM of the verb. Such spreading into a nominal STEM is prohibited. We have argued that this suggests that the nominal STEM is in a different W-domain from the class prefix. In the case of verbs, we will argue that the subject prefix and the verb STEM are in a domain higher than the W-domain. We call this higher domain the C-group domain. Using the spreading criterion therefore we conclude that the subject prefix and the verb stem are in the same C-group. The question surfaces about the state of affairs when there are other particles between the subject

prefix and the verb stem as in (48) below.

48(a) o ya báa jä you eat them

AGR CA OM stem

(b) ó ya báa jä he eats them

AGR CA OM eat

We have established that the AGR o (48a) and the ya are toneless. We have also established that the AGR ó (48b) is H-toned. Since ya in both (48a) and (48b) is toneless and does not have a H tone from the preceding particle, we could conclude that the object marker is H-toned because it surfaces with H tones in both (48a) and (48b). However, when we compare (48) with (49) below, we notice that the examples in (48) are not sufficient to arrive at that conclusion. In (49) the object marker is L-toned.

49(a) o ya ba réekä you buy them

AGR CA OM buy

(b) ó yá ba réekä he buys them

AGR CA OM buy

We are reminded of our discussion of derived nominals such as moipóne where we argued that the H-tone of the reflexive prefix or the object prefix is delinked. If our analysis of the delinking of the H tone is correct, we could assume that the object marker and the stem are in separate P-words. Assuming the object marker and the verb stem are in separate P-words allows us to explain the reason why the H tone does not delink when the verb stem is monosyllabic. The object marker or the reflexive prefix are in the same P-word as the

verb stem only if the stem is monosyllabic. This might be the effects of the Minimality Condition.

If, however, we pursue this line of thinking, we should accept that the subject prefix, the Case Absorber *ya* and the object marker, are not in the same P-word (W-domain) as the verb stem. We therefore could divide the verbal complex in (49) as in (50).

50 [ó ya bá] [réekä]

[AGR CA OM] [verb stem]

This division is consistent with the analysis given for nouns. However, we have also observed that the P-word bounds for nouns are markedly different from the verbal P-words. For instance, we have illustrated that the class prefix (except for class 9) does not pair up with nominal stems at all although subject prefixes, on the other hand, pair up with all verb stems. The division in (50) has another disadvantage. The H tone on the object marker needs to be in the same P-word for the spreading to take place as in (51) below.

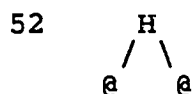
50 ó yá ba báatlä He wants them

H
| \

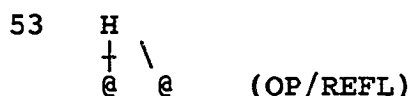
AGR CA OM want

We know that the verb *batla* (51) is toneless. We also know that the object marker is H-toned. We therefore have reason to attribute the H tone on the first syllable of *báatlä* to the preceding H tone on the object marker *bá*. This means that the H tone on the object marker spreads one mora to the

right and lands on the first syllable of the verb stem. If the verb stem is H-toned, we assume that the H tones fuse. The structure for both cases is still a multiply-linked one as in (52).



After Fusion we expect that the rule that delinks the H tone on the object marker applies, with the result that the object prefix surfaces with a L tone in both (50) and (51). The left branch ends up delinked as in (53) below.



We have reason to believe that Fusion takes place here because we are not aware of any single H tone delinking in the language. The application of H tone spreading as in (50) above convinces us that a structure which precedes the delinking of the left branch is doubly-linked. We do not have any evidence to demonstrate that H tones which are to the left of the verb stem also undergo Fusion.

This means that the H tone on the object prefix is not within the same phonological word as the verb stem. The H tone of the object prefix is adjacent to the H tone on the initial syllable of the verb stem. Additional evidence that the H tone of the object prefix is not within the same phonological word as the verb stem could be gotten by appealing to the effects of Meeussen's Rule. The deletion of the second H tone within the P-word domain is what we

call Meeussen's Rule.

If we assume that Fusion also occurs within the W-domain, we have to explain when Fusion instead of Meeussen's Rule takes place. We argued in Chapter 2 that in nouns such as *mosádí*, *moítjí*, etc which surface as [mosáadĩ], [moítjĩ] respectively the second H tone is deleted by Meeussen's Rule. Meeussen's Rule is a strictly W-domain process. If Fusion also vies for the same input, what is the nature of the relationship between it and Meeussen's rule? If we order Fusion before Meeussen's Rule, we would fuse the H tones in *mosádí* instead of deleting the second. We have argued at length that multiply-linked H tones on these words are destined to give us wrong results. If we order Meeussen's Rule before Fusion, it means that the second H tone would not be available at the point where we need a multiply-linked H tone as in (52). To get a structure as in (52) we need to assume that the remaining H tone after Meeussen's Rule spreads one mora to the right as in (54) below.

54 H
 | \
 bá rékisa

OP sell they sell

The trisyllabic verb stem will illustrate this effectively. The H tone spreading from the object prefix can anchor on the first syllable of the verb stem only. But, we know that trisyllabic verb stems such as *rékisa* are pronounced as *rékiisä* instead of *rékiisa* (54). This means

that the problem cannot be solved by ordering.

In short, there is something fundamentally flawed in the assumption that a polysyllabic verb stem is in the same W-domain as the object prefix. It is only if the verb stem is monosyllabic that the object prefix and the verb stem make one phonological word. Since we know that the H tone from the object prefix spreads into the verb stem, we can assume that the object prefix is in a higher layer than the verb stem. The verb stem makes a W-domain by itself while the object prefix is in higher domain, namely the C-domain.

Since the phonological word (W-domain) is assumed to be entirely contained within the C-domain, it follows that the H tone from the object prefix can spread into the verb stem. This is so because the domains are assumed to be 'strictly layered'.

What about other clitics such as the subject prefix? The subject prefix is also not in the same phonological word as a polysyllabic verb stem. In fact, it is never in the same W-domain as any verb stem. It is the head of the C-group. To show that it is the head, we could digress a bit and discuss the morphology of the verbal complex. The discussion of the morphology of the verbal complex should demonstrate that there are several clitics or particles that are C-commanded by the AGR. Some of these clitics are in separate phonological words, others are in the same W-domain. We will use the diagnostic tools already identified to establish the status of each particle in the verbal

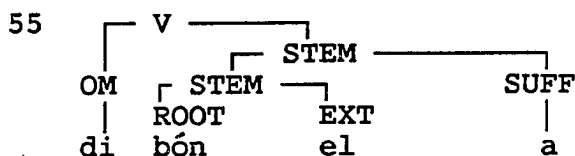
complex. These tools are HTS, RBD, Meeussen's Rule and Downstepping. If, for instance, when two H tones are adjacent the second one deletes, we will know that the two H tones are within the same phonological word. If the two H tones violate the OCP, we will know that they are in separate P-domains or in the C-domain. If the second H tone is downstepped, we will know that they are in separate W-domains or C-groups which are in the same P-phrase.

We need to do this because our discussion of the particles in Chapter 3 showed that a division of morphemes into functional ones and thematic ones is necessary in Sesotho. Functional elements can group themselves as phonological words by themselves. For instance, H-toned particles group themselves as phonological words with class prefixes of nouns. Class prefixes of nouns are grouped with thematic elements only if thematic elements are monosyllabic in class 9 because of the Minimality Condition. In other words, prosodic rules refer to the structure in mapping a syntactic string to a prosodic structure.

In Doke's template the morphology of the verb is as in (55) below.

55 SP-CA (ya)-OM/REFL-V ROOT-EXT*-a

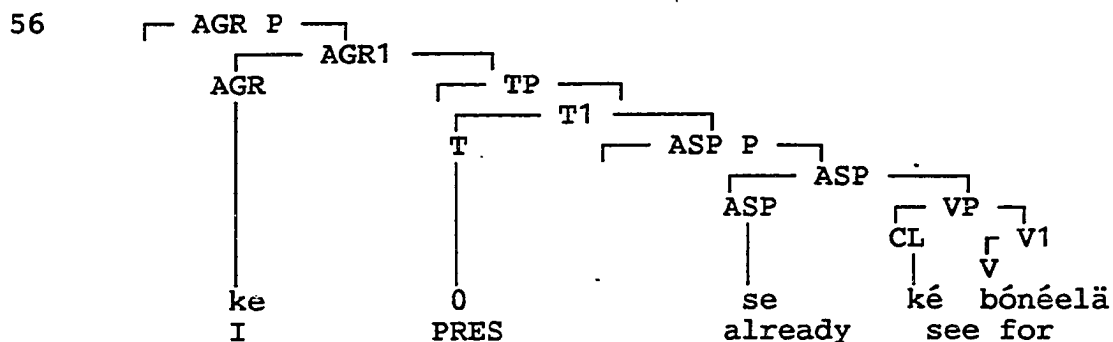
Excluding the subject prefix (SP) and the Case Absorber (CA) *ya*, however, the template has a structure as in (55) in an analysis that stresses the configurational nature of Sesotho.



In (55) the object prefix (OP) is in the spec of V. The suffixal vowel *a* is the right member and therefore the head of STEM. The applied extension (EXT) is sister to the ROOT with the mother node being the lower STEM. This structure allows the Mirror Principle to be captured (Baker 1988). That is, as more extensions are attached, their order and distance from the ROOT will reflect the order of the syntactic processes involved.

In (55) we have the morphological STEM stretching from the ROOT to the suffixal vowel. Since the verb STEM consists of more than one syllable, the morphological STEM is isomorphic with the W-domain. The spec of V, the object marker is outside the W-domain because the STEM is polysyllabic. In the case of monosyllabic verb STEMS, the object marker is in the W-domain. The *ya* is in the C-domain and subject prefix (SP) in the same domain. In order to show the hierarchical structure of these, we need to discuss the structure of Inflection (I) or (Infl) in Sesotho. This hierarchy will be shown to be crucial in our discussion of some tones rules in Sesotho in due course.

Since all sentences always have agreement in Sesotho, we propose an analysis of Infl where the agreement is the head. Hence, we propose the structure in (56) to be characteristic of Infl.



The structure in (56) is not trivial. With this structure we demonstrate several things. First, we show that the AGR element C-commands every other constituent in the Infl. AGR is the head of the projection. Secondly, we show that Infl does not only contain AGR but also contains T (tense) and ASP (aspect). The relationship between these elements is expressed in the structure.

Third, we show that closer to the VP there is a H-toned clitic (CL) which has the same segmental composition as the AGR. We propose that this clitic be an AGR element which has cliticized. Hence, in all such structures the clitic (CL) always has the H tone even if the AGR in the matrix clause is L-toned as in (56). We will use this structure extensively in Chapter 5. It will be shown that the behavior of the Perfective H tone, for instance, is sensitive to this structure. Embedded Perfective H tones do not undergo the deletion process which matrix perfective H tones undergo when the verb does not P-govern anything.

Lastly, we also demonstrate that some tenses can be indicated by a phonologically NULL morpheme as in (56). The structure in (56) will be our basis in our discussion of the

tone of the VP. Our discussion of the different types of sentences in the present tense should be understood against structure (56).

The structure in (56) above needs to be adjusted to accommodate the facts pertaining to the NEG. Negative gives scope to lexical verbs. In the present tense indicative negation is brought about by attaching the toneless NEG particle *ha* and changing the suffixal vowel *a* to *e* as in (57a) and (57b).

57(a) *Ha ké tsamáayë* I am not going

NEG AGR go

(b) *Ha bá rékísé naama* They do not sell meat

NEG AGR sell meat

In the present tense indicative progressive negation is formed by attaching the toneless negative particle *ha* before the lexical verb as in (58a) and (58d).

58(a) *Ha ké sa tsamaaya* I am no longer going

NEG AGR PROG go

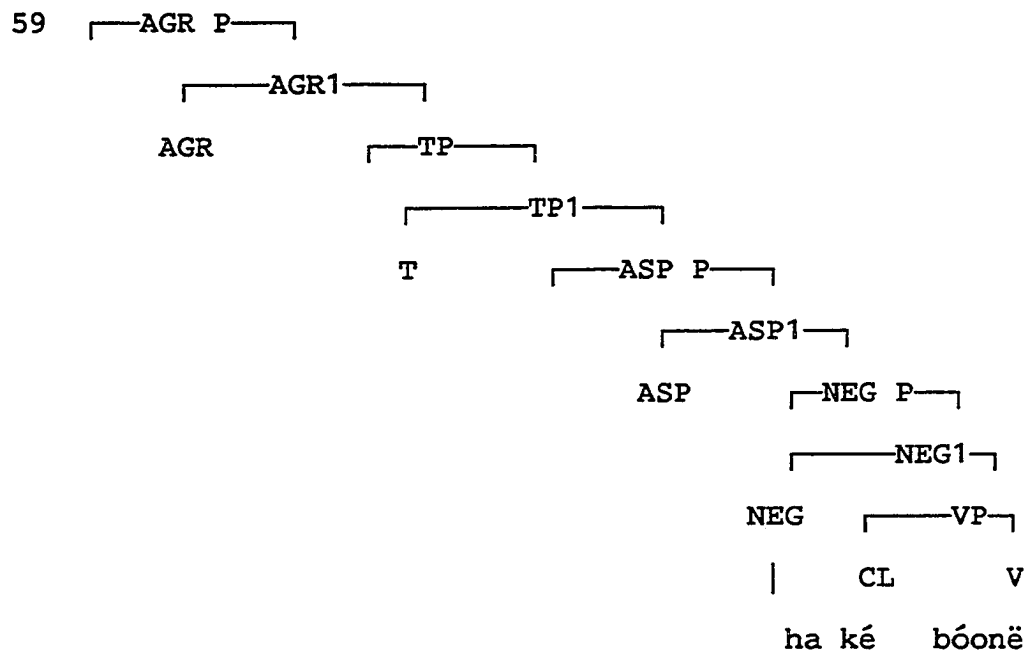
(b) *Ha bá sa rékísa naama* They no longer sell meat

NEG AGR PROG sell meat

We show the negative of both the present tense indicative and the present tense indicative progressive aspect because we have used them to illustrate the behavior of H tones earlier. We have utilized them to emphasize that a verb marked with *ya* and *sa* in the positive always surfaces with a M tone if it does not P-govern another constituent. The condition refers only to the *sa*, because a verb marked by *ya*

is, by definition, not P-governing anything.

The importance of (57) and (58) is in illustrating that the verbal complex can be further complicated by negative morphemes. As a result, the structure of a verbal complex should also have room for the negative morphemes as in (59) below.



If structure (59) is scanned from the bottom up, the first head element C-commanding the VP is the NEG. This is significant because it shows that in Sesotho negation has scope over the VP only. Members of INFL are not affected by it. In addition, the AGR of a negated verb is C-commanded. Structure (58) is also important tonally because the position of the toneless negative particle allows us to make a generalization pertaining to the H-toned clitic (CL) in the spec of VP. The CL is an AGR element that has cliticized and acquired the H tone. This CL is the same as

the CL in structure (55). The reason for our conclusion also derives from the syntactic co-indexation of the CL with NP subject of a sentence as in (59).

59 Nna_j ha ké_j bóoně
 me_j NEG CL_j see-NEG
 I do not see

This discussion of the negative form concludes the discussion of the structure of the VP in the indicative modality present tense. There are other forms in the indicative which we will discuss as we group the different elements into prosodic units on the basis of the diagnostic tools mentioned earlier.

2.1 Domains within the Present Tense Indicative

In terms of our discussion so far the verb stem makes an independent P-word from the rest of the clitics. If it is monosyllabic, it pairs up with the object prefix or the reflexive clitic to the left. The verb stem and the clitic make one phonological word. This holds for both nouns and verbs. Other clitics make a higher domain containing them and the phonological word made of the stem as in (60) below.

60(a) ó yá e [tsámaya]w <--> [ó yá e [tsámaaya]w]C

AGR CA go

He goes it

(b) ó ya [ée jã] <--> [ó ya [ée jã]w]C

AGR CA OM eat

He eats it

(c) ke sá e [rékiisä] <--> [ke sá e [rékiisä]w]C

AGR PROG OM sell

I still sell it

In (60a) the H tone on the object marker e spreads one mora to the right and ends on the first syllable of the verb stem. H tone spreading is possible only if the clitic and the stem are in the same domain or if the stem *tsamaya* is contained within a higher domain containing the object marker. After spreading, the H tone is a multiply-linked H tone which has one branch in the lower domain and the other branch in the higher domain. The branch in the higher domain delinks. In [o ya [ée jä]w]C (60b) the H tone on the object marker é is inside a phonological word that contains the monosyllabic verb stem. When Meeussen's Rule is applied, it leaves the verb stem without a H tone. At the end of phonological phrase, the stem acquires a H tone by the H tone Insertion. This H tone is the one that ultimately surfaces as a M tone. Recall that all verbs which are marked by an object prefix are always at the end of P-domain.

In short, in (60b) H tone spreading takes place. There would be no reason to argue that the object marker is toneless, because the evidence in (60a) is compelling. The H tone on the verb stem *tsámaya* in (60a) should convince sufficiently that the object marker is H-toned. The first syllable of the verb stem can attain that H tone only from a preceding H tone on the object marker.

In [ke sá e [rékíisä]w]C (60c) the H-toned object marker é is adjacent to a H-toned syllable in the P-word rékíisa. The H tone of the object marker is not within the same phonological word as the verb stem. Fusion therefore takes place. One branch of the multiply-linked H tone is on the higher domain and the other branch is in the lower one. The branch on the higher domain delinks. The language thus appears to disallow structures which are multiply-linked in domains that are not equal as in (61) below.

61 * H
 | \
 [..é [é..]]

If the constraint in (61) were correct, it would firmly explain why the H tone on the reflexive prefix or the object prefix delinks. Fused structures on a juncture within a C-domain are always simplified by Left Branch Delinking. Since the left branch is always the branch of the Spec (object prefix or the reflexive prefix), we call this Left Branch Delinking Spec H Tone Delinking.

On the strength of these examples we could conclude that the domain for the C-group extends from the AGR as head of the projection to the first P-word. Let us use other aspectual markers to establish the domains within the verbal complex. We will use verbs in the positive only because the negative will be treated when grammatical H tones are discussed. We will use Doke and Mofokeng's (henceforth D&M) numbers to direct readers to morphological details on each of the examples (Doke and Mofokeng 1957).

2.1.0 The Exclusive Present Tense Indicative (D&M No.419).

Examples of this form of the verb are in (62) below. The gloss is a summary of the template.

62(a) Ke se ké tsámaya I am already going
AGR EXC AGR go

(b) Bá se bá tsámaya They are already going
AGR EXC AGR go

In (62a) the first AGR is underlyingly toneless and the second AGR is H-toned. The EXC morpheme is L-toned. In (62b) it is not clear whether the EXC morpheme se gets a H tone from the H-toned subject prefix because the se is followed by a H-toned AGR. Without any evidence to the contrary, however, we will assume that the H tone on the first AGR in (62b) spreads one mora to the right by HTS and thereafter RBD occurs. Examples in (63) involve H-toned verbs.

63(a) Ó se á rékíisä he is selling
AGR EXC AGR sell

(b) ke se ké réeka I am buying
AGR EXC AGR buy

In both (63a) and (63b) the H tone of the second H-toned AGR either fuses with the H tone of the H-toned verb stem or the sequence violates the OCP. If we assume that the H tones merge, our constraint against H tones linked on unequal domains is flawed. If not flawed, the domains are equal. But, we know that in (63) the H tones violate the OCP because they are in the C-domain. We believe that this is

the case because the H tone on the AGR in (62) undergoes spreading. The H tone spreading in (62) indicates clearly that the stem is contained in a higher domain, namely the C-domain. Thus, the examples present the first counterexample to our constraint because the AGR is in the C-domain, which is higher than the W-domain consisting of the verb stem. In light of this we conclude that (63) is a valid illustration that our constraint is wrong.

Let us use the object prefix to establish where the domains begin and end. Examples in (64) below are informative.

64(a) ke se ké [díi tswa] --> [ke se ké [díi tswa]w]C

AGR EXC AGR OP go

I am growing them

(b) ke se ké [díi já] --> [ke se ké [díi ja]w]C

AGR EXC AGR OP eat

I am eating them

The purpose of the example involving a toneless verb is twofold: one to illustrate that the second AGR is not contained in the W-domain while the object prefix, on the other hand, is contained within a W-domain if the verb stem is monosyllabic and second, to show that the W-domain created by the H-toned object marker cannot be adjacent to another phonological word. If ké (64a) were at the end of the C-domain and object marker dí at the beginning of another C-group belonging to the same P-phrase, we would expect that the H tone on dí would be downstepped. It is

not downstepped. In the place of Downstepping, the H tones are left intact. They violate the OCP. Also, example (64a) illustrates clearly that extratonicity is not lexical. Extratonicity applies after prosodic rules have licensed the syntactic string into a prosodic structure acceptable to the phonology. Without this assumption, there is no way that HTS can be prevented from applying in (64a).

The verb marked by the object prefix is supposed to be at the end of a P-domain. This is clearly demonstrated in (64b) where the application of Meeussen's rule within the W-domain results in the H-toned monosyllabic verb losing its H tone. Since we know that the H-toned monosyllabic verb will lose its H tone only in the context of the object prefix or the reflexive prefix, there would be no reason why we have to compare these forms with cases where the verb P-governs another constituent. An object NP is always in another P-phrase if the verb stem is marked with an object prefix or reflexive prefix. Exceptions are idiomatic expressions such as *ke se ké mó já tsuo* (I am already cheating him). Since such expressions are exceptional, we argue that they could violate Minimality Condition. That is, the monosyllabic verb stem can make a W-domain by itself. The H tone of the object prefix or the reflexive prefix fuse with the H tone of the monosyllabic verb. Since the H of the object prefix is not within the same W-domain as the H tone of the verb stem, Meeussen's Rule cannot apply. Note also that the H tone of the object prefix does not undergo Spec H Tone

Delink even though it is in the C-domain.

Another problem with the behavior of H tones in the Exclusive Present Tense is the fact that the verb stem and its AGR behave like they are participial. In other words, their behavior is like that of a verb which is in a consecutive form as in (65) below.

65(a) ke **já** **ké** **réeka**

AGR eat AGR buying

I eat buying

(b) ke **já** **ké** **di** **réeka**

AGR eat AGR OP buy

I eat buying them

(c) ke **já** **kée** **tswa**

AGR eat AGR go out

I eat going out

(d) ke **réeka** **kée** **ja**

AGR buy AGR eat

I buy-eating

In (65) the boldfaced have the same tonal structure as the boldfaced in (62), (63) and (64). These forms are called the consecutive tense in Doke and Mofokeng (1957). The examples in (65) seem to suggest that the verbal complex for the Exclusive and these consecutive types of verbs consist at least two P-phrases. This has implication for the analysis we have thus far given.

It might be that the H tone on the H-toned monosyllabic verb stem is not deleted by Meeussen's Rule. This H tone

might be deleted by yet another rule which deletes all H tones at the end of a P-domain when the verb is embedded. We will discuss this rule in Chapter 5. For now we just need to say that the analysis based on the application of Meeussen's Rule is ad hoc. This analysis should therefore be rejected for an analysis that explains the deletion in terms of deletion of H tones at the end of a P-domain in subordinate clauses.

This means that the prosodic domains for a verb in the Exclusive Present Tense is as in (66) below.

66 [[ke [se]w]C]P [[ké [réeka]w]C]P

AGR EXC AGR buy

I am already buying

The prosodic structure as in (66) is consistent with the behavior of the H tones in this verbal complex. The first AGR and the Exclusive morpheme *se* make a P-phrase. The next P-phrase is the one made by the second AGR and the verb stem. We come to this conclusion on the basis of the comparison between the tonal behavior of the verb in the Consecutive and the Exclusive verbal complex. No Downstepping between the two P-phrases and in the case of the Consecutive form a FL tonal pattern are signals that indicate that the first verb is a P-phrase separate from the P-phrase made of the second AGR and the verb stem. If we assume this prosodic structure, we would be in a position to make a generalization concerning the deletion of the H tone on the H-toned monosyllabic verbs and the absence of the H

tone on the toneless monosyllabic verbs and the H-toned disyllabic verbs. The generalization is that a H tone is deleted if it is preceded by another H tone if the verb is embedded. In addition, we would be in position to argue that the last syllable is extratonal if the verb is embedded. In other words, the generalizations which we have made for a verb in the Indicative matrix clause cannot be held to be true for embedded clauses. In Chapter 5 we will reiterate this point by formalizing the rules that delete the H tones.

2.1.1 The Future Tense Positive Indicative (D&M No 411)

The template is (AGR FUT tla verb stem). Examples in (67) below illustrate the form of the verb.

67(a) ke tla tsamaaya I will go

AGR FUT go

(b) ó tlá tsamaaya He will go

AGR FUT go

In (67a) all elements surface with a L tone. In (67b) the subject marker is H-toned. This H tone spreads one mora to the right. Hence, the toneless tla (67a) surfaces with a H tone in (67b). The examples cannot inform us about the domains because most of them are toneless. In (68) below we add more H-toned elements to uncover the domains and the behavior of the H tones. (68) is not in D&M (1957).

68 ó tlá r!éeka He will buy

AGR FUT buy

In (68) the H tone of the H-toned subject prefix (AGR)

spreads one mora to the right. The H tone lands on the toneless future marker *tla*. The verb stem is H-toned and therefore has a H tone on the first syllable. The spread H tone is therefore adjacent to another H tone. If the future marker *tla* is in the same phonological word as the verb stem *réeka*, we expect that RBD should follow HTS. RBD does not take place. Instead the second H tone is downstepped. In terms of our claims, this Downstepping signals that the verb stem is in a C-group from the preceding constituent. The subject prefix (AGR) and the future marker make the C-group. The C-groups are in the same P-phrase. This is confirmed by the Downstepping. Let us extend the verbal complex some more.

69 ó tlá b!é !á réeka He will be buying

 AGR FUT PROG AGR verb stem

In (69) we have added the progressive marker *bé*. This progressive marker is H-toned. We have identified that the first AGR and the future marker *tla* create one P-word. The *bé* is downstepped indicating that it is not within the same C-group as the *tla*. The *tla* is H-toned because of HTS. The H tone of the second AGR is downstepped. This Downstepping also signals that this H-toned AGR is not in the C-group as the progressive marker *bé*. The H tone of the verb stem has the same pitch as the H tone of the AGR. OCP is violated. This violation of the OCP indicates that the verb stem is in a P-word contained within a C-domain beginning with the second AGR. (69) is therefore prosodically structured as in

(70) below.

70 [[ó tlá]w]C [[b!é]w]C [!á [réeka]w]C

AGR FUT PROG AGR verb stem

He will be buying

Having established these domains, it becomes the task of phonological rules to refer to them. HTS is predicted to occur within the W-domain as in the first phonological word in (70). Downstepping is expected between two C-groups or two phonological words contained in adjacent C-domains. Hence, the H tone on the progressive marker is downstepped. Likewise the H tone of the AGR is expected to be downstepped because it is adjacent to the H tone on another C-domain.

2.1.2 The Past Tense Indicative Positive

The template for this tense can be summarized as in the gloss in (71) below.

71 ke ne ké réeka I was buying

AGR PAST AGR verb stem

The past marker ne is L-toned in (71). It is preceded by a toneless subject prefix (AGR). The past tense ne is therefore underlyingly toneless. In (72) below the ne is preceded by a H-toned AGR. It still surfaces with a L tone.

72 bá ne bá tsámaya They were walking

AGR PAST AGR walk

In (72) the AGR is H-toned. The ne is still L-toned. We therefore ascribe the lack of the H tone on the ne as indicative of the domain to which it belongs. Unlike the future tla in (70) above, which makes one C-domain with the

first AGR, the first AGR makes a C-domain not only with the past marker *ne* but also with the second AGR and the verb stem as a P-word contained in the C-domain. This is illustrated in (73) below.

73 [bá ne bá [tsámaya]w]C

The verb stem is the only P-word that marks the end of the C-domain. The beginning of the C-domain is the first AGR. The H tone on the AGR undergoes HTS and then RBD follows because there is a H tone within the same C-domain. The H tone of the second AGR also spreads into the toneless stem. This spreading confirms the fact that the verb stem is contained within a larger domain, namely the C-domain. The elements in (73) can be increased as in (74).

74 bá ne bá tlá b!é b!á di kgárameetsa

AGR PAST AGR FUT PROG AGR OM verb stem

They would have been pushing them

In (74) we have included several elements in the verbal complex. Two elements are downstepped. We know that Downstepping occurs in juncture positions between two C-domains or P-words that are contained within one P-phrase. On this basis of the downstepping diagnosis we therefore group the first AGR with the past *ne* and the second AGR in one C-group which also contains the future marker *tla* as the P-word. The second C-domain (de facto a P-word) consists of the progressive marker *bé*. The last C-group consists of the third AGR, the object marker and the verb stem as the P-word within the C-domain. This is illustrated in (75) below.

75[bá ne bá [tlá]w]C [[b!é]w]C [b!á di [kgárameetsa]w]C
 That is, (75) has three C-groups which are contained within one P-phrase. (75) is illuminating in that it demonstrates that the exercise of rehearsing through every verbal type in the positive is unnecessarily inflationary. We will therefore analyze the potential modality and the participial submodality as our last illustration of the tonal patterns for verbs which do not involve grammatical tones.

2.1.3 Potential Modality (D&M 423, 425)

The verbal complex involving this modality consists of a subject prefix (AGR), a potential marker *ká* and a verb stem as in (76) below.

76(a) o *káa* *jä* you can eat

AGR POT eat

(b) ba *ká* *tsamaaya* they can leave

AGR POT verb stem

In (76a) the subject prefix is toneless. We know that the first person singular and plural, and the second person singular and plural have subject prefixes which are underlyingly toneless. The rest of the subject prefixes in the indicative are known to be underlyingly H-toned. In (76b), however, we note a surprising feature of the subject prefix, namely that it is L-toned. At first glance these subject prefixes may be analyzed as underlyingly H-toned. Considering the fact that this is a different modality and that some subject prefixes are segmentally different (the third person subject prefix is *a* instead of the usual *ó*),

however, it is logical to assume that the L-tonedness of these subject prefixes is, in fact, their characteristic feature. That is, the subject prefixes are underlyingly toneless. To show that these subject prefixes for the potential modality are indeed toneless, we could show them in a position where the verb is multi-verbal as in (77).

77 bá ne bá ka tsamaya They could have walked

AGR1 PAST AGR2 POT stem

The second AGR *bá* (77) is H-toned, because it is in an embedded position. Toneless AGRs in the indicative retain their tonelessness only if they are not embedded. Once they are in the embedded position, all AGRs become H-toned. We could state this by a rule as in (78).

78 0 ----> H/ -- (AGR C-commanded by AGR)

Rule (78) simply inserts a H tone on all AGRs that are C-commanded by another AGR. Recall that our exposition of the morphemes of the verbal complex shows that the head of the I is an AGR which can C-command several AGRs. All these C-commanded AGRs will surface with a H tone by this rule. This rule captures what we mean by cliticization of the AGR explicitly and formally. If we assume the correctness of this rule for cases involving C-commanded AGRs, we predict that AGRs that are C-commanded by head AGRs which make a P-word with the habitual markers are also H-toned. But, as can be demonstrated in (79) below, the AGRs which follow the *ye* and the *ke* habitual markers are not H-toned.

79 Ke ye ke jé/tswé/réekë/baatlë/rékiisë/tsamáayë

AGR HM AGR eat/go/buy/want/sell/walk

I usually eat/go/buy/want/sell/walk

According to Rule (78) the second AGR in (79) should be H-toned because it is embedded. The second AGR for the habitual is L-toned, however. This means that the rule applies to AGRs in the indicative modality only.

The potential marker *ká* is H-toned because it surfaces with a H tone when it is preceded by a toneless syllable as in (76a) and (76b). In (77) the H-toned *ká* surfaces with a L tone. The toneless verb stem *tsamaya* does not surface with a H tone on the first syllable. Our discussion of the past indicative has shown that the first AGR1, the Past *ne* the second AGR2 are all in the same C-group which ends with the verb stem as the phonological word within the C-group. The presence of the potential marker *ká* immediately after the second AGR2 creates a situation where the second AGR and the potential marker are paired together as a phonological word.

A C-group beginning with the first AGR1 ending with a phonological word made of the AGR and the potential *ká* is formed. It is by the application of Meeussen's rule that we could identify this. In addition, the fact that the H tone of the potential marker does not spread into the verb stem is supportive of the claim that they are in separate C-groups. The verb stem *tsamaya* makes a phonological word and a C-group by itself. We illustrate this in (80) below.

80 [bá ne [bá ká]w]C [[tsamaya]w]C

Prosodic rules that map the syntactic string to the phonology would therefore create prosodic units as in (80). Phonological rules would apply and only refer to these domains. For instance, it is predicted that Meeussen's rule would delete the second H tone within the W-domain and nowhere else because it is constrained to apply only within the W-domain.

2.1.4 The Participial Submodality (D&M 430)

The participial is a submodality of the indicative. The major difference is that a participial verb is always in a subordinate clause. Since it is a dependent clause, its AGR is always H-toned by the cliticization rule (78) above. Examples of the participial clauses are in (81) below.

81(a) ke já k!é búa I eat talking

AGR eat AGR2 talk

(b) bá tsámaya bá rékisa nama

AGR go AGR2 sell meat

They go about selling meat

In (81a) we notice that the H tone of second AGR2 ké is downstepped.

We have argued earlier that Downstepping is a diagnostic tool for identifying C-groups or phonological words that are in the same P-phrase. On the basis of the downstepped H tone on ké we conclude that the first AGR and the first verb stem create a separate C-group from the one made by the second AGR2 and the second verb stem. Thus,

prosodic rules would group the first AGR with the first verb stem as a P-word within the first C-group and the second AGR2 with the second verb stem as a P-word within the second C-group. This is illustrated in (82) below.

82 [bá [tsámaya]w]C [bá [rékísa]w]C

Our phonological rules would then refer to these domains.

For instance, in (82) HTS applies in the first C-group. The H of the AGR spreads to the first syllable of the verb stem. The H tone of the AGR and the H tone of the verb stem within the second C-group violate the OCP because the H tone of the AGR is adjacent to the H tone of the verb stem making a phonological word (P-word). If the first C-group were to end with a H tone and the second to begin with a H tone, Downstepping would take place.

We conclude our discussion of the verbs not involving grammatical H tones by reiterating that, because our rules refer to domains, the effects of these rules can be used to diagnose how domains are made in Sesotho. On the basis of these diagnostic tools we can postulate the prosodic rules that map the syntactic string into prosodic domains. The rule is stated in (83) below.

83 Clitic Group Formation

I C domain

The domain of C consists of an AGR C-commanding non P-words to the first P-word delimited by the domain of a P-word.

II C construction

Join into an n-ary branching C all P-words included in a string delimited by the definition of the domain of C. [borrowed and adjusted from N&V 1986:154]

The prosodic units which we have demonstrated can be constructed by the rules in (83). Recall that the P-word domain for nouns is different from the P-word domain for verbs.

2.2 Application of Rules

This is a sketchy demonstration of how the proposed rules apply. We repeat the analysis for clarity.

A monosyllabic verb where the verb P-governs some constituent has a H tone if it is underlyingly H-toned as (84) shows and is L-toned if it is underlyingly toneless as in (85).

84 Ke já nama. I eat meat

AGR eat meat

85 Ke tswa lethóopa. I develop a boil.

AGR come boil

Once the AGR is H-toned as in (86) and (87) respectively, the H tone of the AGR and that of the verb are

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takes the phonological word as host. We have shown that this is also supported by the application of the RBD when the host begins with a H-toned syllable. Moreover, if the H tones were to be at the edges of C-groups or P-words, one should have expected that the H tone on the verb stem would have downstepped by the Downstepping rule. Since the H tone on the verb stem does not downstep, the AGR and the verb stem are both in domains lower than the P-domain. It is only when the object NP *nama* is taken into consideration that we have one phonological phrase. In this P-domain the object NP *nama* is at the end of the domain. This takes us to the situation where the verb is at the end of the P-domain.

Monosyllabic verbs marked by Case Absorber *ya* are all at the end of a P-domain. Examples in (88) and (89) are for monosyllabic verbs that are H-toned and toneless respectively. The AGR is also toneless.

88 Ke ya já I eat

AGR CA eat

89 Ke ya tswa I go out

AGR CA go out

These examples are interesting only when compared with cases where the AGR is H-toned as in (90) and (91) respectively. The H tone on the AGR spreads one mora to the right and is followed by RBD if the verb is H-toned as in (90). If the verb stem is toneless the H tone spreads one mora to the right and remains linked as in (91).

- 90 Bá ya já They eat
 AGR CA eat
- 91 Bá yá tswä They go out
 AGR CA go out

We also notice that the toneless verb stem in (91) suddenly surfaces with a M tone. By the application of the HTS in the C-domain, the chances for the application of H Insertion are increased if the verb stem is monosyllabic. What happens is that the penult syllable has a H tone and is followed by a toneless final syllable. This environment is ideal for the application of the H Insertion at the end of P-domain.

Another process that occurs at the end of the P-domain is Lengthening. This process provides an extra mora on the penult syllable. When default rules apply, they provide the mora with a L tone. The L tone between the adjacent H tones in adjacent syllables causes the lowering of the final H tone. The result is the M tone at the end of the P-domain. Once again, the predictions which our theory makes are borne out.

Besides the M tone the data also confirms our claim that the H tone on the AGR is in the C-domain because our comparison of (90) and (91) show that in (90) the Case Absorber ya has no H tone while in (91) it has a H tone. This can easily be attributed to the delinking of the right branch by RBD. We know that in domains higher than the C-domain such as the P-domain, HTS applies, but is never

followed by RBD even when there is H tone after the targeted toneless syllable as in (92).

92 Ke ráta p!ódí hahólo. I like a goat too much
 AGR like goat much

In (92) after the H tone on the verb *ráta* has spread one mora to the right, it is not followed by the delinking of the right branch. Instead the H on the first syllable of *pódí* is downstepped. This is correctly predicted by our theory because these constituents are in a P-domain. (92) has an added advantage for our theory because it rules out any possibility for a formulation of HTS rule restrictedly as in (93) below.

93 H
 | \ †
 @ @ @

Rule (93) is unmotivated in the grammar. This fact is, in fact, desirable because it reiterates the need for rules to be local. A rule that has a trigger seeing beyond the target is always suspect and undesirable for the grammar (McCarthy and Prince 1986, Myers 1987, Cole 1987). In our theory HTS is local, general and pervasive.

Further evidence that our rules predict the correct result for monosyllabic verbs in the present tense indicative can be attained by topicalizing the object NP as in (94) and (95). In (94) we have a toneless AGR followed by a toneless Case Absorber *ya*, H-toned object marker *é* and a H toned monosyllabic verb stem. In (95) we have a

toneless AGR followed by a toneless CA *ya*, a H-toned object marker and a toneless verb stem.

94 Nama(top) ke ya é jä. As for meat, I eat.

Meat(top) AGR CA OM eat

95 Motho(top) ke ya mó tswä. A person I disappoint.

Person(top) AGR CA OM go out.

Both in (94) and in (95) we notice that the verb stem ends with a M tone. There is neutralization of oppositions here. We also notice that object marker (OM) in each is H-toned. In terms of our prosodic structure, we know that the object marker and the monosyllabic verb stem are in the same W-domain.

In the case of (94) therefore we have a situation where two H tones are adjacent within the W-domain. Our theory predicts that the second H tone will delete by Meeussen's rule. Meeussen's rule is crucially ordered after HTS. So, after the deletion of the second H by Meeussen's rule there is no difference between the H-toned verb stem and the toneless one. At the end of the P-domain the two verb stems get a H tone by H Insertion. The end of this final H tone is that it will be pronounced as a M tone as described earlier. That explains why the two verb stems are pronounced the same in this context.

The sentences where the AGR is H-toned as in (96) and (97) are not interesting because they take us back to the discussion of the spread of the H tone within the C-domain. In both these examples the toneless Case Absorber *ya* is

followed by the H-toned object marker and therefore RBD is expected to follow HTS. Hence, in both (96) and (97) the CA ya is L-toned on the surface.

96 Nama bá ya é jä. Meat they eat.

Meat(topic) AGR CA eat.

97 Motho bá ya mó tswä. A person they disappoint.

Person AGR CA OM go out.

Verbs with more than one syllables are in (98) below. (98a) is an example of a disyllabic verb where within a P-domain the lexical H tone has spread one mora to the right as predicted by our rules. (98b) is an example of a trisyllabic verb where the lexical H tone has spread one mora to the right leaving the last syllable toneless. (98c) is a quadrisyllabic verb where the H tone has spread one mora to the right. Toneless counterparts would not have any H tone in all cases where the AGR is toneless.

98(a) Ke réká nama I buy meat

AGR buy meat

(b) Ke rékísa nama I sell meat

AGR sell meat

(c) Ke kgúrúmetša motho I cover a person

AGR cover person

When the AGR is H-toned, the H tones violate the OCP because they are in the C-domain. The AGR takes the verb stem as its host. Examples in (99) should be taken as indicative of these claims.

- 99(a) Bá réká nama They buy meat
 AGR buy meat
- (b) Bá rékísa nama They sell meat
 AGR sell meat
- (c) Bá kgúrúmetša motho They cover a person
 AGR cover person

That the AGR is within the C-group which has the verb stem as the host is further exemplified by the fact the H tone on the AGR can spread one mora to the right if the verb stem is toneless as in (100).

- 100(a) Bá tswá h!á ka. They come from my place
 AGR come at mine
- (b) Bá bátla nama They want meat
 AGR want meat
- (c) Bá páqama fáatshě They lie down
 AGR lie down
- (d) Bá kgárametša motho They push
 AGR push person

The behavior of these tones suggests to us that the AGR and the verb stem are in the same C-group. H tones do not spread to toneless syllables in separate constituents within a P-domain. A lower domain where such behaviors are typical is the C-group. Hence, we conclude that the AGR and the verb stem make a C-group. This is the domain for RBD, HTS and violation of the OCP.

The cases where the verb does not Case-assign another constituent because of the presence of the Case Absorber ya

are in (101) below. We will use the H-toned AGR only to illustrate the behavior of tones in these contexts. Verbs marked by *ya* are all at the end of a P-domain. So, in the case of monosyllabic verbs as in (101a) there is no change to the H tone of the verb. The H tone on the AGR spreads one mora to the right as predicted by our theory and thereafter RBD applies within the C-domain. The cases with a M tone as in (101b) and (101c) are those cases where the last syllable is provided with H tone by the H Tone Insertion rule which applies at the end of a P-domain. And, as predicted by our theory a mora is added by Lengthening in the same domain with the result that a L tone between the penult H and the final H tone causes the final H to be pronounced as a M tone.

- 101(a) Bá a já They eat
 AGR CA eat
- (b) Bá a réekä They buy
 AGR CA buy
- (c) Bá a rékiisä They sell
 AGR CA sell

That the H tone on the AGR spreads one mora to the right and thereafter the right branch delinks can be shown by the fact that if the verb stem is toneless as in (101) the Case Absorber *ya* surfaces with H tone. The absence of the H in (101) suggests that there has been delinking.

- 102(a) Bá yá tswä They go out
 AGR CA go out
- (b) Bá yá batla They want
 AGR CA want
- (c) Bá yá paqama They lie
 AGR CA lie

(102a) further shows the validity of the claim that a H tone is inserted at the end of P-domain because in (102a) a toneless monosyllabic verb tswa surfaces with a M tone.

In conclusion, our discussion of the verb in the Indicative will be complete as soon as we have discussed the negative form of the verb. We will, however, postpone the discussion of the negative because the negative introduces a grammatical H tone. This grammatical H tone introduces some interesting theoretical issues which need special attention. An analysis of the grammatical H tone is done in the next chapter where modalities such as the imperative and the subjunctive will be discussed.

CHAPTER 5

Grammatical H Tones: Assimilation and Dissimilation

1 Introduction

The aim of this chapter is to complete our discussion of the verbs by analyzing the tonal structure of the verbs in the negative form, in the narrative participial form, in the perfective form, in the habitual modality, in the subjunctive modality, in the relative clause, and in the imperative modality. H tones characterizing verbs in these forms display tonal behavior totally different from the tonal behavior of verbs such as the verb in the affirmative form, the non-perfective form, the non-habitual form and the non-subjunctive form. (Refer to Chapter 4 for the description of these verbs). The lexical H tones which characterize verbs described in Chapter 4 distinguish themselves by the fact that when they spread, they spread one mora to the right. In addition, the H tone spreading which takes place with these verbs is not iterative.

In this chapter we will discuss H tones which spread iteratively. We will call these H tones Grammatical H tones because they play a role similar to grammatical affixes in the language. Grammatical H tones are, in essence, morphemes which are "composed of segments only on the tonal tier" (Goldsmith 1990). We will be concerned with the nature of these H tones and their relationship with lexical H tones. This discussion will enable us to analyze the role played by the OCP in the grammar of Sesotho in much more

detail than in the preceding chapters.

2 Assimilation and Dissimilation of Grammatical H tones

2.0 The Negative Form

First, we will analyze the negative form of the verb in the indicative. The morphology of the negative verb in the present tense indicative has been discussed in Chapter 4. We repeat the template in (1) below for convenience.

(1) NEG ha SP (OP) verb ROOT (EXT) SUFF -e

The negative is a frame consisting of the Neg formative ha on the left end of the frame and the terminative suffixal vowel -e on the right end. The negative is also characterized by H tones which are different from lexical H tones. Counting the syllables from left to right, there is always a H tone that surfaces on the second syllable of a negative verb. This H tone characterizes all negative verbs. An example of such a negative verbal complex is in (2) below.

(2) Ha bá kgarámétsé batho

NEG SP push people

They do not push people

In (2) above the verb kgarámétsé is underlyingly toneless. Recall that we have established the tonal structure of the positive form of this verb in Chapter 4. It surfaces as kgàrà mètsà in the positive. The negative form is evidently different from the positive in that the negative has a H tone on the second syllable.

Second, we will observe that there are two types of

negative forms: one type where the verb P-governs the constituent after it and the other type where the verb does not P-govern any constituent. In (3) below we have examples of a negative verb which P-governs another constituent and in (4) an example of a verb which does not P-govern any constituent.

3(a) Ha ké réké naama. I do not buy meat

NEG AGR buy-NEG meat

(b) Ha ké batlé mootho. I do not want anybody

NEG AGR go out-NEG anybody

4(a) Ha ké réekë I do not buy

NEG AGR buy

(b) Ha ké baatlé I do not want

NEG AGR want

In (3) and (4) we have pairs of verbs: the (a) part is a H-toned verb and the (b) part is a toneless verb. Both H-toned verbs and toneless verbs have a grammatical H tone on the second syllable. We also note that the AGR is H-toned even though in the positive conjugation it is toneless. In structure (55) above we have demonstrated the position the Negative Phrase occupies in an AGR phrase. We have formulated a rule for cliticization of the AGR in the embedded clause as (77) above. The AGR in embedded phrases cliticizes to the host and therefore acquires a H tone even if it is toneless in the matrix clause. Examples (2), (3), and (4) all confirm that Rule (77) is correct. All AGRs in a Negative Phrase are H-toned.

Having said that about the AGR in the embedded phrase, how do we account for the pronunciation in (3) and (4) above? First we notice that in (3a) and (4a) the verb stems have a H tone. The cliticized AGR also has a H tone pronounced at the same pitch as the H tone of the verb stem. The lexical H tone on the initial syllable of the verb stem is not downstepped. The H tone of the AGR is in the same C-group as the H tone on the initial syllable of the stem as in (5a) for (3a) and (5b) for (4a) respectively.

$$\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ 5(a) \text{ [ha ké ré[ké]w]C} \end{array}$$

$$\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ 5(b) \text{ [ha ké ré[ké]w]C} \end{array}$$

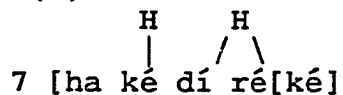
Since the two adjacent H tones in (5) are within the C-group, they can violate the OCP or Fusion can take place. Our discussion of the prosodic domains for a verb in the positive conjugation in Chapter 4 has shown that the whole verb stem makes a phonological word. No syllable is left out. But, in the negative conjugation, the first syllable of the verb stem is left out as is illustrated in (5). The left edge of the P-word of the negative verb is the second syllable of the verb stem.

Although H tones in the C-domain are allowed to violate the OCP, if the H tone is linked to a specifier such as the object prefix or the reflexive prefix, no violation of the OCP is tolerated. The H tone of the specifier merges with the lexical H tone on the first syllable of the verb stem.

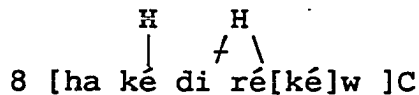
We know that Fusion does take place because in some cases the H tone in the C-domain delinks as in (6) below.



We propose that in (6) above the H tone on the object prefix and the H tone on the initial syllable of the verb stem fuse as in (7) below.



The doubly-linked H tone in (7) above is subsequently changed to a structure as in (8) by the application of the Spec H Tone Delinking rule. In other words, Fusion does take place in the C-domain. But, Fusion is clearly verifiable when the H tone in the C-domain is on the specifier.



It is important to remember that the delinking of the left branch in (8) above is not a response to violations of the OCP. The branch delinks even if there is no preceding H tone as in *ke a dī réeka* (I am buying them). The H tone of the object prefix delinks even though there is no H tone on the preceding syllable. The *ke* and *a* are L-toned. The purpose of the structure in (8) is to demonstrate that without assuming that Fusion takes place, it would be difficult to explain the surfacing of a L tone in examples such as (8).

In order to expose more of the structure of the negative verb, we need to add more examples. In (9) we use trisyllabic verbs which P-govern NPs.

9(a) Ha ké rékísé naama I do not sell meat
 NEG AGR sell-NEG meat

(b) Ha ké paqámé mootho I don't lie on a person
 NEG AGR lie on NEG person

In (10) we use quadrisyllabic verbs which also P-govern other constituents.

10(a) Ha ké kgúrumétsé mootho I don't cover a person
 NEG AGR cover person

(b) Ha ké kgarámétsé mootho I don't push a person
 NEG AGR push a person

All these sentences show that the AGR is H-toned. The H tone of the AGR and the lexical H tone are kept at the same pitch. These H tones are both in the C-domain. In addition, in (10) there is another H tone other the lexical H tone. This is clearly demonstrated in (10a) where the verb *kgúrumétsé* has H tones up to the last syllable. It is only the syllable next to the initial syllable which does not have a H tone. We know that the lexical H tone spreads only once and is not iterative. Therefore, the syllables that have H tones after the L tone in *kgúrumétsé* could not have gotten these H tones by the spreading of a lexical H tone. Hence, we conclude that there is an additional H tone that accompanies the verb in the negative. In the case of toneless verb stems as (10b) the H tone on the second

syllable is more conspicuous than in H-toned verbs, because the second syllable of toneless verb stems suddenly surfaces with a H tone. This fact immediately draws our attention to examples (3), (4) and (9) above where the second syllable of the verb stems all surface with a H tone or a M tone. This H tone is the grammatical H tone.

We assume that the grammatical H tone links on the second syllable as in (11) below.

11 ha ké kga[rámétse]

H H

| |

We also assume that the point at which the grammatical H tone is linked is also the beginning of a prosodic domain. Grammatical tones are, in essence, morphological affixes. In other words, attaching the grammatical H tone is the same as morphological affixation (see Pulleyblank 1986:67-100, Goldsmith 1990). That is, the brackets in (11) indicate the morphological bounds for the negative. The syllable where the negative H tone is linked marks the beginning of the negative morphological plane. Prosodic rules recognize these planes. Hence the left edge of the phonological word begins at the syllable where the negative H tone is associated. It is within the negative plane where the grammatical H tone spreads iteratively.

This grammatical H tone spreads iteratively up to the final syllable of the verb stem if, and only if, the verb P-governs the constituent that follows it as in (9) and (10). In cases where the verb does not P-govern any constituent as

in (12) below the grammatical H tone only spreads up to the penult.

12(a) Ha ké réekë. I don't buy

NEG AGR buy-NEG

(b) Ha ké rékiisë I don't sell

NEG AGR sell-NEG

(c) Ha ké kgúruméetsë I don't cover

NEG AGR cover-NEG

The negative of verb stems which are toneless is even more revealing because it shows the patterns more explicitly as in (13). It shows that the H tone is linked to the second syllable from the left and spreads to the penult or the ultima depending on P-government.

13(a) Ha ké baatlé. I don't want meat

NEG AGR want-NEG meat

(b) Ha ké batlíisë. I don't cause anybody to search

NEG AGR look-CAUS-NEG

(c) Ha ké kgaráméetsë. I don't push anybody

NEG AGR cover-NEG

Also, all negative verb stems except the toneless disyllabic ones are pronounced with a M tone on the final syllable when the verb does not P-govern any constituent.

What do these observations tell us about the behavior of the grammatical H tone? First, the verb stem is divided into two morphological planes. That is, H tone spreading can take place in one plane without affecting the other plane. Second, since these are independent planes, the

lexical H tone and the grammatical H tone cannot cross association lines unless the two planes have been collapsed together by Tier Conflation.

This means that the grammatical H tone can spread one to the right within its plane before or after Tier Conflation. The grammatical H tones spread after Tier Conflation in Sesotho. Since all the syllables after the second syllable where the grammatical H tone links surface with H tone, we assume that H tone spreading which occurs in this plane is iterative. The rule is formalized in (14) below.

$$14 \quad \begin{array}{c} H \\ | \quad \backslash \\ e \quad e \end{array} \quad (\text{iterative})$$

Since the rule is iterative, we need a mechanism to express the dependency between the initial point and the targeted location beyond which no further spreading can be allowed. The distance between the initial point and the targeted location varies from one verb stem to the other. There is, however, one common element in all, namely that there is a right boundary to the spreading: the final syllable of the verb stem if the verb P-governs another constituent, or the penult if the verb does not P-govern any constituent. In other words, although the distance between the trigger and the last target is theoretically infinite, the limit is the final syllable of the verb stem or the penult.

In Nguni languages iterative spreading occurs.

Goldsmith et al deal with the problem by suggesting that the H tone is attracted to a metrically prominent syllable or to the accent which is placed on the antepenult syllable by metrical rules (Goldsmith et al 1986). In line with Goldsmith et al (1986) we propose to express the dependency between the trigger and the last target by using a metrical structure. We therefore propose a rule as in (15) below.

15 Construct a right-headed binary constituent at the right edges of all verb stems to which grammatical H tones are attached if such verbs P-govern other constituents or a left-headed binary constituent if such verbs do not P-govern any constituent.

Having built the metrical structure as in (15), the grammatical H tone can spread by Rule (14). Since the rule is iterative, it applies until the grammatical H tone reaches the head of the metrical constituent. In other words, the rule would simply state: spread a grammatical H tone to the head of the metrical constituent. For verbs that P-govern other constituents, the rule predicts that from the second syllable up to the final syllable H tones would surface if the verb P-governs the next constituent and from the second syllable to the penult syllable of the verb stem H tones would surface if the verb does not P-govern anything.

Perhaps a simpler way of dealing with this dependency would be to assume that the final syllable is extratonal, if the verb does not P-govern anything. When the verb P-

governs another constituent, the final syllable would be visible to tone rules. This proposal is attractive. But, considering that the metrical structure which we propose by Rule (15) above, would be later utilized to constrain the application of the delinking rules, we prefer the attraction-to-the-head analysis to the extratonicity analysis.

In (16) below we demonstrate how the rules apply. In stage 1 we show the linking of a grammatical H tone by Association Convention.

H
|

16 Stage 1 ha ké kga/rakgarametse/

In (16) above the grammatical H tone is linked to the second syllable of the verb stem. The grammatical H tone is otherwise floating just as a verbal lexical H tone floats and links by the Initial H Tone Association rule. According to Pulleyblank some grammatical tones are prefixal, others are suffixal (Pulleyblank 1986). In our analysis, these grammatical H tones float and link to the second syllable by Association Convention. It follows that the parentheses in (16) are not prosodic domain brackets, but morphological planes. We will, however, argue that prosodic rules use the morphological brackets because the left edge of the morphological plane is the beginning of a P-word and the right edge the end of a P-word.

In (17) below we illustrate the application of the metrical rules.

$$\begin{array}{c} \text{H} \quad \quad \quad * \\ | \quad \quad \quad (* *) \\ \text{17 Stage 2} \quad \text{ha ké kga/rákgarametse/} \end{array}$$

In (17) we have a reduplicated verb stem in the negative. A right-headed binary constituent is built on the right edge of the verb by the metrical rule (15). Tier Conflation applies and the two H tones from different planes. Then, spreading of the grammatical H tone takes place. In (18) below we demonstrate the spreading of the grammatical H tone until it reaches the head of the metrical constituent on a verb which is underlyingly toneless.

$$\begin{array}{c} \text{H} \\ | \quad \backslash \quad \backslash \quad \backslash \quad \backslash \\ \text{18 Stage 3} \quad \text{ha ké kga/rákgáramétsé/} \end{array}$$

In (18) the grammatical H tone which is linked to the second syllable of the verb spreads iteratively until it reaches the head of the binary constituent. The example which is used in (18) is for a verb which P-governs another constituent. If it were a verb which does not P-govern another constituent, the head would be the penult and therefore the spreading would end at the penult.

After the spreading of the grammatical H tone, the structure of the toneless verb is as in (19) below.

$$\begin{array}{c} \text{H} \quad \quad \quad \text{H} \\ | \quad \quad \quad | \quad \backslash \quad \backslash \quad \backslash \quad \backslash \\ \text{19 Stage 4} \quad [\text{ha ké kga}[\text{rákgáramétsé}]\text{w }]\text{C} \end{array}$$

In (19) we show the effects of prosodic rules on a negative form after Tier Conflation. There are rules such as HTS and RBD which are crucially ordered before the Grammatical H Tone Spreading. In other words, HTS applies in (19) above before the H tone within the phonological word is multiply-

linked. Right Branch Delinking also applies while the grammatical H tone is still a singly-linked tone.

This means that the H tone on the AGR spreads one mora to the right within the C-domain as in (20) below.

$$\begin{array}{c} \text{H} \quad \quad \quad \text{H} \\ | \quad \quad \quad \backslash \quad | \\ 20 \text{ [ha ké kga[rákgáramétsé]} \end{array}$$

The H tone on the AGR has to spread one mora to the right because there is a toneless TBU after it. After the application of the general spreading rule (HTS), two H tones become adjacent. OCP is therefore violated. Recall that the grammatical H tone is now in the same tonal tier with the lexical tone because Tier Conflation has applied. The right branch of the doubly-linked lexical H tone delinks by RBD. The delinked branch gets a L tone when default rules apply. The results are as demonstrated in the phonetic realisation in (21) below.

21 [hà ké kgàrákgáramétsé] PR

The second implication of the prosodic structure in (19) is that if the verb is H-toned, two H tones become adjacent within the C-domain and the grammatical H tone is alone in the P-word domain as in (22) below.

$$\begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \\ | \quad | \quad | \\ 22 \text{ [ha ké kgú[rúkgúrúmétsé]w]C} \quad \text{I don't cover a bit} \\ \text{NEG AGR cover-reduplicated} \end{array}$$

In (22) there are two H tones in the C-domain and one H tone is within the P-word contained in the C-domain. The two H tones within the C-domain violate the OCP within the C-domain. If we assume that they fuse, the fused H tone in

the C-domain is then adjacent to a singly-linked H tone within the P-word as is illustrated in (23) below.

$$\begin{array}{c} \text{H} \quad \text{H} \\ / \quad \backslash \quad | \\ 23 \text{ [ha ké kgú[rúkgúrúmétsé]} \end{array}$$

The structure in (23) fits the structural description for the application of RBD. If RBD were to apply, however, ungrammatical pronunciations would be gotten. In other words, the kgú of kgúrukúrúmétsé would surface with a L tone. This means that the structural description for LBD would also not be met. This provides us with an added motivation for the claim that the OCP can be violated in the C-domain.

Since we have established that HTS and RBD are crucially ordered before the Grammatical H Tone Spreading, we have reason to conclude that in the case of H-toned verbs, HTS would not apply because all syllables would be linked to H tones. Once HTS has not applied, there would be no branching structure to make it possible for the RBD to apply. This ordering restriction is necessary because there would be no reason to justify the application of LBD as opposed to RBD when there are two adjacent H tones which are both multiply-linked as in (24) below.

$$\begin{array}{c} \text{H} \quad \text{H} \\ / \quad \backslash \quad | \quad \backslash \quad \backslash \quad \backslash \quad \backslash \\ 24 \text{ [ha ké kgú[rúkgúrúmétsé]} \end{array}$$

Instead of structure as in (24) we want a structure as in (25) below at the point when LBD applies..

$$\begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \\ | \quad | \quad + \quad \backslash \quad \backslash \quad \backslash \quad \backslash \\ 25 \text{ [ha ké kgú[rúkgúrúmétsé]} \end{array}$$

It is only after the Grammatical H Tone Spreading that a structure as in (25) is gotten. LBD is the only rule that can apply because the rightmost tone is multiply-linked. Even if the first two H tones on the left are allowed to violate the OCP within the C-domain, we still have to assume that the H tone on the initial syllable of the verb stem and the negative H tone are not allowed to violate the OCP because the left branch of the multiply-linked negative H tone delinks by LBD. LBD itself is formalized as in (26) below.

26 H H
 | +\
 [e [e e e ..]w]C

LBD is, in essence, a mirror image of RBD. Instead of delinking the right branch of a multiply-linked structure, the left branch is delinked if it is preceded by another H tone. The delinked syllable acquires a L tone by default rules. The ultimate results of the application of the rules are displayed in (27) below.

27 [hà ké kgùrùkgùrùmétsé] PR

If Rule (26) LBD were to apply on a negative verb stem which has less than four syllables ungrammatical utterances as in (28) below would be generated.

28 *hà ké rékìsé I don't sell (something)

NEG AGR sell

The pronunciation in (28) is unacceptable because the second syllable of the verb stem is L-toned instead of H-toned. It can only be L-toned if LBD has applied. This means that LBD

has to be blocked from applying to negative verb stems that have less than four syllables.

Since we have always been arguing against rules that count, at the outset we will rule out the possibility of using syllables to constrain LBD. We will consequently exploit the metrical structure which we have proposed to constrain the application of the grammatical H spreading. In an attempt to use the metrical structure we note that there is no delinking or deletion within the metrical constituent. In light of this observation, we propose a constraint against deletion or delinking of a H tone within the metrical constituent. The constraint is expressed in (29) below.

29 No delinking within the metrical constituent.

There is an advantage in proposing that it is the metrical structure that actually prevents the rule from generating ungrammatical pronunciations. The advantage is that this becomes an added motivation for proposing that a metrical structure is necessary for verbs with grammatical tones.

The constraint as in (29) would do the job for us. That is, with (29) there is no way in which a two-syllable or a three-syllable verb could ever have the left branch of the grammatical H tone outside the metrical constituent. This ensures that *réké* and *rékisé* do not undergo LBD. This is so because in *réké* the asterisk on line 1 and 2 is on the last syllable and in *rékisé* the left member of the pair of asterisks making a constituent is on the penult and the

right member of the asterisks making a constituent on the ultima. So, neither the *ké* in *réké* nor the *kí* in *rékisé* can delete or delink because they are within a metrical constituent. A filter such as (29) is preferable because it flows naturally from our theory while, at the same time, it captures a generalization about the language.

30(a) Ha kée jë I do not eat

NEG AGR eat-NEG

(b) Ha kée tswë I do not go out

NEG AGR go out-NEG

Lastly, monosyllabic verb stems such as *jë* and *tswë* (30) are pronounced with M tone whether the verb stem is toneless or H-toned. This suggests that the tonal contrast in these verbs neutralizes if these verbs do not P-govern any constituent. This neutralization happens in the usual way. When GHTA (Grammatical H Tone Association) applies to a H-toned monosyllabic verb, there is no toneless syllable to link to. Hence, the grammatical H tone deletes by Stray Erasure. At the end of the P-domain, however, Lengthening occurs. An extra mora is consequently added to the penult. When default rules apply, a L tone is inserted on the toneless mora. A F tone on the penult is thus gotten. Hence, the H tone on the final syllable is realised as a M tone as in (31) below.

L	HL	M	
30	[ha kée	[jé]w]C	or [há kée jë] PR

Note that prosodic rules do not change the morphological

boundaries created by attachment of the grammatical H tone to the verb stem. Note also that the AGR is not within the P-word in spite of the fact that the verb stem is monosyllabic. This means that requirements for the Minimality Condition are never satisfied by using AGR. In the case of the toneless verb, the grammatical H links to the only available TBU comprising the toneless verb stem as required by the Linkage Condition. This is illustrated in (32) below.

H
|
32 [ha ké [tswe]w]C

In (32) the grammatical H tone links onto the verb stem. Just as the H tone on the H-toned monosyllabic verb stem does, the H tone of the negative monosyllabic verb stem surfaces as a M tone if the verb does not P-govern anything. In other words, at the end of a P-domain the penult syllable gets an additional mora by Lengthening. When default rules apply, the extra mora is linked to a L tone. A HL tonal sequence on the penult is gotten. Hence, the H tone on the final syllable is lowered to a M tone.

If the verb P-governs the constituent after it, the structural description for Lengthening cannot be met. The HL tonal sequence on the penult is thus missing. There is no possibility for the H tone on the final syllable to be lowered to a M tone. Hence, negative monosyllabic verb stems surface with a H tone within a P-domain as in (33) below.

33(a) [ha ké jé nààmà]	(b) [hà ké tswé tààbà]
NEG AGR eat meat	NEG AGR come out news
I do not eat meat	I do not release news

In (33) both a H-toned verb stem and a toneless one surface with a H tone. The examples also illustrate clearly that the AGR is never within a P-word. If the AGR were to be in the same P-word as the verb stem, ungrammatical pronunciations would be generated because Meeussen's rule would delete the second H tone.

To recapitulate, we have stressed the fact that the rules which we have posited for nouns do apply to verbs. We have also discussed the GHTS rule. We have demonstrated that the metrical structure is crucial in the analysis of the spreading of grammatical tones because it constrains the spreading and provides us with a principled explanation for the delinking of H tones on some syllables and not on others. In light of this, we have proposed a filter, namely that no H tone delinks within a metrical constituent. The rest of the alternations can easily be explained in terms of the rules already posited. This leads us to the discussion of other forms involving grammatical tones. To complete the picture, we will discuss the narrative participial, the perfective, the habitual modality, the subjunctive, relative clause and the imperative modality .

2.1 The Participial Narrative Past Tense

The form of the verbal complex referred to as the participial narrative past tense in this study is

characterized by a sequence of verbs representing the sequence of events which are being related by the speaker. The examples in (34) below capture this succinctly.

- 34(a) ... mmé ba jé nama, ba tswé meharó
 ... then AGR eat meat AGR come out greed
 and then they ate meat and satisfied their greed
- (b) ... ke réké naama, ke batlé piitsá,
 ... AGR buy meat, AGR look for pot
 and then I bought meat and looked for a pot
- (c) ... le rékisé naama, le kgutlélé moráao
 AGR sell meat, AGR go back
 and then he sold the meat and went back
- (d) ... ba kgúrumétsé mootho, ba kgarámétsé mootho
 AGR cover person, AGR push person
 and then they covered the person and pushed him

In (34) we have examples of monosyllabic verb stems (34a), disyllabic verb stems (34b), trisyllabic verb stems (34c) and quadrisyllabic verb stems (34d). The verb in the left is H-toned and the one in the right is toneless. All subject prefixes are toneless. Hence, they surface with a L tone. This tonelessness of the subject prefixes distinguishes the present tense subject prefixes from these because all third person subject prefixes for the present tense are H-toned. The tonal structure of the verb stem is exactly the same as the tonal structure of a negative verb stem. This implies that the generalizations which we have established for the negative verb stem should hold for this

form of the verb. The difference is brought about by the tonelessness of the subject prefixes for the participial narrative past.

Since the examples in (34) are for verbs that P-govern the constituent after them, we can make the following remarks concerning the derivation:

- (a) A grammatical H tone associates with the second syllable of the verb stem.
- (b) A metrical constituent is constructed at the right edge of the verb by metrical rule (Rule 15).
- (c) Tier Conflation occurs.
- (d) Grammatical H Tone Spreading Rule applies. For the examples in (34) the head of the binary constituent is on the final syllable because the verbs P-govern other constituents in (34). If the verbs do not P-govern other constituents, the head would be on the penult.
- (e) LBD takes place and delinks the left branch of the multiply-linked H tone within the P-word. However, if the verb stem consists of syllables which are less than four, LBD is prevented from applying by the filter which prohibits delinking within the metrical constituent.

(f) If the metrical head is on the penult, verb stems consisting of more than two syllables get a H tone by H Tone Insertion at the end of a P-domain. Lengthening occurs on all verbs at the end of a P-domain. After the application of default rules, the penult syllable is characterized by a F tone. The H tone on the final syllable is thus lowered to a M tone as in (35) below.

35 ba réekë, ba rékiisë, ba paqáamë, ba kgúruméetsë

AGR buy, AGR sell, AGR lie down, AGR cover

and then they bought, sold, lay down and covered.

In (35) we do not have examples of monosyllabic verb stems ba jé (34a) and ba tswé (34a) because they all surface with a H tone. The reason is that the AGR is toneless in this tense. This implies that at the end of P-domain the penult for a monosyllabic verb is L-toned after the application of default rules. Hence, the final H tone cannot be lowered to a M tone. These remarks should suffice for this tense. Our next form of the verb is the habitual modality.

2.2 The Habitual Modality

The morphology of a verbal complex in the habitual modality is characterized by the AGR, the habitual marker (HAB) ye or ke, a L-toned AGR and the verb stem with a terminative suffixal morpheme -e as in (36) below.

36(a) bá ke ba batlé dijó They usually want food

AGR HAB AGR want food

(b) bá ye ba réké dijó They usually buy food

AGR HAB AGR buy food

Tonally the structure of the habitual is exactly the same as the participial narrative past discussed in (2.1) above. The embedded AGR after the habitual marker is underlyingly toneless. A habitual grammatical H tone associates with the second syllable by the Association Convention. A metrical structure is constructed on the right edge of the verb stem. If the verb P-governs another constituent as in (36) the head of the binary constituent is the right member of the constituent. If the verb does not P-govern any constituent, the head is the left member of the binary constituent. This explains why verb stems with more than two syllables get a H tone by H Tone Insertion at the end of a P-domain. This H tone is the one that ultimately surfaces as a M tone as in (37) below.

37(a) ke ye ke rékíisë I usually sell

AGR HAB AGR sell

(b) bá ye ba kgúruméetsë They usually cover

AGR HAB AGR cover

(c) re ke re kgarákgáráméléetsë We usually push for

AGR HAB AGR push for (redup)

(36) and (37) show clearly that the observations which we have made when analyzing the participial narrative past in (2.1) should hold for these forms. We will therefore assume the correctness of that analysis for this form.

2.3 The Perfective Indicative (D&M 402)

The template for a verb which P-governs another constituent in the present tense perfective aspect is as

shown in the gloss in (38) below.

38(a) ke tswilé lethóopa I have grown a boil

AGR come-PERF boil

(b) ó tswilé lethóopa He has grown a boil

AGR come-PERF boil

In (38) the verb stem consists of a monosyllabic root which is extended by a perfective morpheme *-il-*. The terminative vowel is *-e* instead of the usual *-a*. Because of the VC nature of the perfective morpheme, there is no perfective verb stem which is monosyllabic. All perfective verb stems comprise two syllables or more.

The verb stem *tswa* in the non-perfective form is toneless. We have demonstrated this in Chapter 4. But, once the perfective morpheme is attached to it, it surfaces with a H tone if the verb P-governs a constituent after it as in (39). If the verb does not P-govern anything as in (40) below, the verb stem surfaces with L tones.

39(a) ke tswilé lethóopa I have grown a boil

AGR come-PERF out boil

(b) ó rékílé nama He has bought meat

AGR buy-PERF meat

(c) ó kgúrumédítsé diijó He has covered the food

AGR cover-PERF food

(d) ó kgarámédítsé motho He has pushed a person

AGR push-PERF person

Compare the forms in (39) with the forms in (40) where a perfective verb does not P-govern anything.

- 40(a) ke tswiile I have come out
 AGR come-PERF out
- (b) ó rékíilë He has bought
 AGR buy-PERF
- (c) ó kgúrúmediitse He has covered
 AGR cover-PERF
- (d) ó kgaramediitse He has pushed
 AGR push-PERF

In (39) the grammatical H tone for the perfective associates with the second syllable by Association Convention. In (40), however, the grammatical H tone does not seem to have linked to the second syllable of the verb. We will argue, however, that the grammatical H tone does link to the second syllable of the verb stem.

In other words, there is reason to believe that the grammatical H tone for the perfective does link onto the second syllable. Toneless verb stems such as tswilé (39a), and kgarámédítsé (39d) show that the second syllable from the left edge always surfaces with a H tone if the verb P-governs another constituent. In this respect the grammatical H tone for the perfective behaves like other grammatical H tones. However, the fact that the perfective H tone does not surface if the verb does not P-govern anything as in (40) above is still a mystery. The mystery is made even more complex by the fact that the H tone on the AGR for the perfective verb stem does not spread one mora to the right in spite of the availability of a toneless TBU

after it. In other words, the H tone on the AGR behaves as if there is a H tone on the second syllable of the verb stem. In short, in *ó kgarameditse* (40d) the H tone on the AGR is supposed to spread one mora to the right by HTS, but it appears not have spread.

That the H tone on the AGR does not spread one mora to the right suggests that there is some trace of the grammatical H tone on the second syllable in (40d). What this implies is that the perfective H tone does not just float over the verb stem, but floats over the second syllable of a perfective verb stem as in (41) below.

$$\begin{array}{c} \text{H} \quad \text{H} \\ | \quad \quad \\ 41 \text{ } \acute{\text{o}} \text{ kgarameditse} \end{array}$$

This assumption, although weird in the sense that a floating H tone just floats over one syllable, is crucial in establishing the reasons why the TBU immediately following the H-toned AGR does not surface with a H tone. We know that in some cases HTS rule is followed by RBD. In other words, assuming that there is a H tone floating on the second syllable of the verb stem allows us to conclude that the H tone on the AGR spreads one mora to the right as in (42) below. After spreading the H tone becomes adjacent to the floating H tone on the second syllable of the verb stem. RBD applies because such a sequence of identical tones violates the OCP. Recall our definition of the parameters for the OCP in Sesotho.

$$\begin{array}{c} \text{H} \quad \text{H} \\ | \quad \backslash \\ 42 \text{ } \acute{\text{o}} \text{ kgarameditse} \end{array}$$

The structure in (42) is a suitable structure for *ó kgarámédítsé* (39d). The structure in (42), however, would have to have an association line between the H tone and the second syllable to be justifiable. Without any association line as is the case in (42) it would be difficult to demonstrate how the sequence of these tones violates the OCP.

Approached from a different angle, however, the structure in (42) can be used as evidence that the perfective H tone actually floats over the second syllable. The structure seem to suggest that RBD has taken place. In other words, the application of RBD is independent evidence to show that the H tone floats over the second syllable of the perfective verb stem.

In an attempt at reducing the weird nature of this floating H tone on the second syllable of the perfective verb stem, we could assume that the perfective H tone links onto the second syllable and thereafter another rule, which delinks or deletes it, applies. The rule which delinks or deletes it is a rule which applies to the perfective verb stems which do not P-govern other constituents. With this assumption, we could argue that the H tone on the AGR spreads one mora to the right while the association line between the skeletal tier and the tonal tier still exists. In other words, if we order HTS and RBD before the delinking or deletion of the perfective H tone from the second syllable, we can justify the surfacing of a L tone on the

syllable which is preceded by a H-toned AGR. In short, the L tone on such a syllable is evidence that there has been an association line, which has later been removed by a rule. This proposal is plausible but is made less attractive by the nature of the rule that removes the association line. Only perfective H tones for verbs that do not P-govern anything delete. This is so in spite of the fact that such verbs are already marked not to be P-governing anything by the left-headed nature of the metrical constituent.

We have argued in Chapter 4 that verbs that do not P-govern anything are at the end of a P domain. So, we can formulate a rule that removes the H tone by using prosodic domains as conditioning environment for the rule. The rule is formalized in (43) below.

43 H -----> 0 / ---]P (Perfective with unembedded AGR)

Rule (43) merely deletes a H tone which is at the end of a P-domain if the verb stem is in the perfective form and the AGR is not embedded. We restrict the rule to verbs in the perfective form because it only affects perfective verbs whose AGR is not embedded. In other words, we do not want the rule to delete grammatical H tones in examples such as in (43b) below.

43(b) Ke ne ké tsamáíilë.

AGR PAST AGR go(PERF)

I had walked

Ke tla bé k!é kgúrumédíitsë

AGR FUT COMPL AGR cover(PERF)

I will have covered

In (43b) the perfective H tone does not delete even though the verbs do not P-govern any constituent. This means that the prosodic domains which we have used to constrain application of our phonological rules cannot be used. The extra syntactic information associated with the rule clearly demonstrates that there is no obvious principle involved here. That is, that the H tone deletes only if the AGR is not embedded does not follow from any obvious principle. Concerning P-government, however, the verb is tonally marked not to be P-governing because the head of the metrical constituent is still the penult. This means that even our appeal to prosodic domains as the rule reflects is just ad hoc. This is just an irregularity in the language which might have a historical origin.

There is yet another problem, namely that the H tone on the object prefix spreads one mora to the right as in (44) below.

44 ó mo kgáramediitse You have pushed him

AGR OP push-PERF

In (44) we observe that the H tone of the object prefix has spread one mora to the right. The H tone on the object

prefix is thus different from the H tone of the AGR. In the non-perfective form we have noted that the H tone of the AGR and the H tone of the object prefix spread into the verb stem. In the perfective only the H tone of the object prefix undergoes HTS. We know that HTS has applied in (44) because the first syllable of the toneless verb stem surfaces with a H tone. We also know that the object prefixes are H-toned in Sesotho. Hence, we attribute the H tone on the first syllable of the verb stem in *ó mo kgárameditse* (44) to the H tone of the object prefix. In fact, we have established that the H tone of the object prefix delinks by the Spec H Tone Delink. Hence, the object prefix itself surfaces with a L tone even though it is underlyingly H-toned.

That the H tone of the object prefix spreads one mora to the right creates a problem for our proposal that the first syllable of the verb stem in *ó kgarameditse* (40d) is L-toned because the right branch of the spread H tone has delinked by RBD. The problem is: why does RBD not apply in *ó mo kgárameditse* (44) because the second syllable of the verb stem in *ó mo kgárameditse* (44) should have a H tone floating?

Viewed from another angle, however, the spreading of a H tone of the object prefix can be used as evidence to show that in *ó kgarameditse* (40) HTS and RBD have applied. In both *ó kgarameditse* (40) and *ó mo kgárameditse* (44) we can justify the difference in tonal behavior of the H-toned AGR

and the H-toned object prefix by appealing to ordering of rules. In other words, it is the comparison which shows clearly that HTS has applied. The relevant rules for the comparison are: HTS, Spec H Tone Delink, RBD and Perfective H Tone Deletion. In (45) we illustrate the application of the rules on ó kgaramedítse (40) and in (46) on ó mo kgáramédítse (44). The derivation shows the forms after Grammatical H Tone Spreading has applied.

$ \begin{array}{c} \text{H} \quad \quad \text{H} \\ \quad \quad \backslash \backslash \\ 45 \text{ ó kgarámédítse} \\ \text{H} \quad \quad \text{H} \\ \quad \backslash \quad \backslash \backslash \\ \text{ó kgáramédítse} \\ \text{-----} \\ \text{H} \quad \quad \text{H} \\ \quad \backslash \quad \backslash \backslash \\ \text{ó kgarámédítse} \\ \text{ó kgaramedítse} \\ [\text{ó kgàrà mèdììtsè}] \end{array} $	<p>Tier Conflation</p> <p>HTS</p> <p>Spec H Tone Delink</p> <p>RBD</p> <p>Perfective H Tone Deletion</p>
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In (45) we merely demonstrate the interaction among the rules: HTS, Spec H Tone Delink, RBD and the Perfective H Tone Deletion rule. We do the same in (46) below. The derivation shows the form after Grammatical H Tone Spreading has applied.

	H	H		H					
				\ \					
46	ó	mó	kgá	rámé	dítse				Tier Conflation)
	H	H		H					
			\	\ \					
	ó	mó	kgá	rámé	dítse				HTS
	H		H						
		+	\	\ \					
	ó	mo	kgá	rámé	dítse				Spec H T Delink

	ó	mo	kgá	rámé	dítse				RBD
	ó	mo	kgá	rámé	dítse				Perfect H T Deletion
	[ó	mò	kgá	rámé	dítse]		PR

What the derivations in (45) and (46) demonstrate is that Spec H Tone delink bleeds RBD because once Spec H T Delink has applied, RBD does not occur. This solves the mystery for us. The H tone which surfaces on the first syllable of the verb stem in *ó mo kgáramédítse* (44) is not a counter-example to the proposal that the second syllable of the perfective verb stem is linked to a H tone at the point where RBD takes place. In other words, the Perfective H tone is deleted after RBD has applied.

The solution of the mystery regarding the perfective H tone cannot be complete without mentioning that Rule (43), Perfective H Tone Deletion does not apply if the verb is followed by an adverb as in (47) below.

47(a) *ó kgaráméđítse hámpé, mootho éeo.*

AGR push badly person that

He has pushed badly, that person

(b) *ó kgúruméđítse kápeelé, Thaabo*

AGR cover fast, Thaabo

Thaabo has covered fast

In (47) we have examples of sentences where verbs do not P-govern the adverb even though the adverbs are arguments to them. We have argued earlier that there is evidence to show that the verb and the adverb are not within the same P-domain in spite of the fact that the verbs theta-mark the adverbs. For instance, in (48) we expect Downstepping of the H tone of the first syllable of the adverb because the verb theta-marks the adverb. But, no Downstepping takes place because the verb does not P-govern the adverb. The verb and the adverb are in separate P-domains.

48(a) ke nwá hámpé

AGR drink fast

I drink fast

If indeed the verb and the adverb are in separate P-domains as example (48) illustrates, we expect the perfective H tone to delete by Rule (43). In other words, examples (47) should be as in (49) below.

49(a) ?ó kgaramediitse hámpé, mootho éeo

(b) ?ó kgúrúmediitse kápeelé, Thabo

We note, however, that examples in (49) are questionable. Since these examples are marginal, we have to assume that Rule (43) does not apply if the verb is followed by the adverb. The question is: does this imply that the adverbs are in the same domain as the verbal head?

If we assume that the adverb is still in a separate P-domain from the P-domain of the verb stem, we should expect that examples in (49) should be ideal rather than marginal.

Examples (47), on the other hand, should be exceptions to the rule because the perfective H tone should delete since the adverbs are not in the same P-domain as the verbs. Recall that Rule (43) deletes all perfective H tones on verbs at the end of P-domain in the matrix clause. We will argue that the behavior of tone in the context of an adverb suggests that this rule misses a generalization. The perfective H tones do not delete because the H tones are at the end of a P-domain. Instead the H tones delete because the perfective verb is in the matrix clause.

But we know that examples which are more acceptable are those in (47) instead of those in (49). Once more, there is a paradox. In order to resolve this paradox, let us seek syntactic evidence. Adverbs (particularly non-nominal adverbs) are adjuncts in Sesotho. For instance, when the Case Absorber *ya* co-occurs with an adverb, marginal sentences such as examples in (49) are generated. We demonstrate this in (50) below.

50(a)?Thabo ó yaa já, hámpé

Thabo AGR CA eat badly

Thabo eats, badly

(b)?Nna ke ya bóonä, kápelé

Me AGR CA see, fast

I see fast

In order for sentences in (50) to be more acceptable the Case Absorber *ya* has to be absent as in (51) below.

51(a) Nnā kee já hámpé

Me AGR eat badly

I eat badly

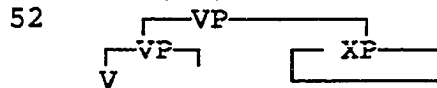
(b) Nna ke bóona kápelé

Me AGR see fast

I see fast

Note that the verb *bóonā* (50b) ends with a M tone while in (51b) it ends with a L tone. Also, notice that the H tone on the first syllable of the adverb in both (50a) and (51a) is not downstepped. Syntactically, the adverb does not seem to be sister to the verbal head. The verb need not be marked by a Case Absorber *ya* to be freed from sisterhood, because adverbs are never sister to verbal heads. Hence, the sentences with a Case Absorber *ya* are marginal.

Constituents which follow a verb marked by a Case Absorber *ya* are in a Chomsky-adjoined position as the structure in (52) below illustrates (Khoali 1990).



In other words, if the verb is marked by Case Absorber *ya* and the constituent which follows it is an adverb, that adverb is in the position indicated as XP in structure (52). In short, the adverb is Chomsky-adjoined. But we have argued that the adverb is, in fact, always in adjoined position if it modifies the verb. This means that it is not necessary for the verb to be marked with a Case Absorber *ya* in order for the adverb to be in an adjoined position. That

is, the Case Absorber *ya* is redundant. For the adverb to be in an adjoined position it does not need the Case Absorber *ya*. Hence, the sentences with a Case Absorber *ya* are marginally acceptable.

Tonally the behavior of the perfective H tone reminds us of this syntactic argument. In other words, marginal sentences as in *ó kgaramediitse hámpé* (49) are cases where tone is redundantly utilised to signal that the adverb is Chomsky-adjoined. Acceptable sentences as *ó kgarámédíitse hámpé* (47a) and *ó kgúrumédíitse kápelé* (47b) are instances where redundancy is avoided. No additional devices are used to signal the position occupied by the adverb. The adverb is just Chomsky-adjoined. This suggests that redundancy is avoided by restructuring the prosodic domains so as to block the application of the deletion of the perfective H tone at the end of a P-domain.

For *ó kgarameditse hámpé* (49a) or *ó kgúrúmeditse kápelé* (49b) the phonological phrase remains unchanged. For *ó kgarámédíitse hámpé* (47a) and *ó kgúrumédíitse kápelé*, on the other hand, the phonological phrase is restructured. The two P-phrases are merged into one P-phrase ($[[[...w]C]P [[...w]C]P \rightarrow [[[...w]C [[...w]C]P]$). The effects of the restructuring are that the Perfective H Tone Deletion does not apply. Redundancy is therefore avoided. Restructuring of a phonological phrase is one of the mechanism typical of Prosodic Hierarchy theory (see Nespor and Vogel 1986:176). Moreover, the head of the metrical constituent for a verb

which does not P-govern anything is still the penult. Hence, the verb in (47) still does not P-govern the adverb even though the rule for the deletion of the perfective H tone treats the structure as if the verb P-governs the adverb. We would be cheating ourselves if we were to convince ourselves that this solution is final. Our future research on the subject may perhaps prove us wrong. For the time being, this solution should suffice.

To recapitulate, the Perfective H tone is characterized by the following tonal behaviors:

- (a) Like all grammatical H tones, the perfective H tone links with the second syllable of the verb stem.
- (b) Tier Conflation occurs
- (c) Like all grammatical H tones, the perfective H tone spreads iteratively up to the head of the metrical constituent.
- (d) After GHTS has applied, HTS, RBD and Spec H Tone Delink rules apply according to the following order: HTS first, Spec H Tone Delink second, RBD third and lastly Perfective H Tone Deletion.
- (e) Perfective H Tone Deletion does not apply if the P-phrase has been restructured to accommodate the syntactic effects of the adverb in Sesotho. If the Perfective H Tone Delink applies, we get marginal pronunciations.

2.4 The Subjunctive Modality (D&M 447)

The morphology of a verbal complex in the subjunctive is as the gloss in (53) below.

53 hore ké tsámaayé
 that AGR verb stem-SUFF -e
 that I may go

The gloss in (53) shows that the subjunctive verbal complex consists of a H-toned AGR, a verb stem which ends with the vowel -e as the suffix. Monosyllabic verb stems and disyllabic verb stems that do not P-govern other constituents as in (54a) and (54b) are characterized by the lack of a H tone on the final syllable of the verb stem.

54(a) hore kée je/tswe
 that AGR eat/go out
 that I may eat/go out
 (b) hore kée báatle/réeke
 that AGR want/buy
 that I may want/buy

Both a H-toned verb stem as jé (54a) and a toneless verb stem tswé (go out) (54a) surface with a L tone if the verb does not P-govern another constituent. The same is true for disyllabic verbs. The second syllable of a H-toned disyllabic verb stem such as réeke (54b) and the second syllable of a toneless one such as báatle (54b) surface with a L tone.

A toneless trisyllabic verb stem and a H-toned one both surface with a H tone on the first syllable, a L tone on the

second and a H tone on the final syllable as in (55) below.

55(a) hore ké rékiisé

that AGR buy

that I may buy

(b) hore ké bátliisé

that AGR search

that I may search

The tonal structure in (55) is kept the same even if the verb P-governs another constituent. If the verb stem has four or more syllables, the first syllable and the last syllable surface with a H tone as in (56) below.

56(a) hore ké kgúrumetsé/kgárametsé

that AGR cover/push

that I may cover/push

(b) hore ké kgúrukgurumeetsé/kgáarakgarametsé

that AGR cover-REDUP/push-REDUP

that I may cover a bit/push a bit

Examples in (56) and (55) clearly demonstrate that the surface forms for the verb in the subjunctive undergoes neutralization. Both toneless and H-toned verb stems surface with the same tonal pattern. We know that já (eat), réka (buy), rékísa (sell) and kgúrúmetša are underlyingly H-toned while, on the other hand, verbs such as tswa (go out), batla (want), batlisa (search) and kgarametša (push) are toneless. In the subjunctive, the monosyllabic ones surface with a L tone irrespective of the tonal type: the disyllabic ones surface with a H tone on the first syllable and a L

tone on the second syllable: verbs with more than two syllables surface with a H on the first and the last syllables. This means that there is an extreme kind of neutralization in the subjunctive form.

Assuming the correctness of the underlying forms as stated earlier, we give possible analyses for this neutralization. Firstly, oppositions in monosyllabic verb stems and disyllabic verbs stems as in (54a) and (54b) respectively are neutralized because of the grammatical H tone. If the monosyllabic verb stem is toneless, the grammatical H tone for the subjunctive links with the only syllable available as in (57a). If the verb is underlyingly H-toned as in (57b), the grammatical H tone has no syllable to link to. The H tone then deletes by Stray Erasure Convention.

57(a) ké tswe

H
⋮

(b) ké jé

H -->0
|

In (57a) the subjunctive H tone links because there is a toneless syllable. In (57b) one of the H tones (underlying H tone for the verb and the subjunctive H tone) deletes by Stray Erasure. It is of no consequence which one of the H tones deletes. Both a toneless and a H-toned verb monosyllabic have a H tone. This H tone is kept intact if the verb P-governs another constituent as in (58) below. But, if the verb does not P-govern another constituent as in

(54a) above, the H tone deletes.

58(a) hore ké jé nama

that AGR eat meat

that I may eat meat

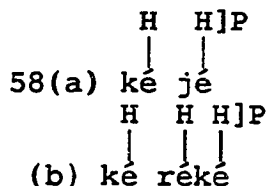
(b) hore ké tswé lethóopa

that AGR go out boil

that I may grow a boil

In (58) both verb stems surface with a H tone. Hence, neutralization of oppositions has occurred. In (57) the H tone on the verb stems is absent. We attribute the absence of this H tone to a rule that deletes it. Our first choice of rules that delete H tones is Meeussen's rule. We note, however, that the verb stem is alone within the P-word. So, the H tone on the verb stem cannot delete because of Meeussen's rule. Meeussen's rule is strictly a P-word domain span rule in Sesótho.

Since we cannot use Meeussen's rule, we have to assume that this deletion is a response to the lack of shifting of the subjunctive H tone. In other words, we observe that if the verb stems have enough syllables, there is no deletion that occurs as in (55) and (56) above. When the head is the same as the initial point for the association of the grammatical H tone, the H tone deletes. The grammatical H tone has to be at the end of a P-domain and be preceded by another H tone as in (58) below.



In view of these observations, we propose to explain this deletion by rule as in (60) below.

$$60 \text{ H} \text{ ----} \rightarrow \text{0} / \text{H} \text{ --]P} \quad (\text{subjunctive})$$

|
*

The rule merely deletes a H tone linked to head which is preceded by another H tone if such a H tone is at the end of a P-domain. The asterisk is meant to indicate that the H tone is the head. Application of this rule leads to results as in (61).

- 61(a) hore kée je/tswe
 that AGR eat/go out
 that I may eat/go out
- (b) hore ké réeke/báatile
 that AGR buy/want
 that I may buy/want

In (61) all verb stems are at the end of P-domain and are preceded by a H tone. If the verb is monosyllabic, the H tone is on the AGR. If the verb is disyllabic, the H tone is on the first syllable of the verb. The H tone which deletes is clearly the grammatical H tone if the verb is disyllabic.

It is not easy to demonstrate where the grammatical H tone links because it always surfaces on the final syllables if the verb has more than two syllables. But, considering

that all grammatical H tones which we have discussed in this study link on the second syllable of the verb stem, there is reason to believe that the subjunctive H tone also associates with the second syllable of the verb stem as in (62) below. The grammatical H tone associates by Association Convention.

$$\begin{array}{c} \text{H} \\ | \\ 62 \text{ ké rékirekise} \end{array}$$

Once associated as in (62), the subjunctive H tone shifts to the head of the metrical constituent. The head of a metrical constituent for a verb which is in the subjunctive is the final syllable. If one adopts the extratonicity analysis, one could just argue that no syllable is extratonic if the verb is in the subjunctive modality. So, the subjunctive H tone shifts to the final syllable in (63).

$$\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ 63 \text{ ké ré[kirekisé]} \end{array}$$

Since in all cases the subjunctive H tone is always preceded a H tone, there is sense in arguing that the shifting of a subjunctive H tone is some form of repair strategy to avoid a sequence of identical autosegments at the tonal tier. This line of reasoning also helps explain the reasons behind deletion of the subjunctive H tones which are preceded by other H tones at the end of a P-domain. Within a P-domain the H tones are immune to deletion because the H tone signals that the verb P-governs another constituent.

That the process is shifting not spreading is not obvious. However, since there is no evidence to indicate

the traces of spreading in the language, we conclude that the H tone shifts to the final syllable (Goldsmith 1990). On the other hand, we could argue that the subjunctive H tone associates with the final syllable. This argument, however, weakens our claim that the tones are linked from left to right in Sesotho. In addition, there would be no way we could explain the lack of the H tone on the second syllable of H-toned verbs such as *rékírekisa* for *ké rékirekiisé* (63). With H-toned verbs such in (63) we would have expected the lexical H tone on the first syllable to spread one mora to the right by HTS. But, the second syllable of the verb stem in (63) is L-toned. This means that the H tone on the first syllable has to be prevented from landing on the second syllable. The only way we can block it, is to assume that at the time HTS applies, there is a H tone on the second syllable.

In short, subjunctive H tone Shifting is ordered after HTS. HTS feeds subjunctive H Tone Shifting because application of HTS makes it possible for toneless initial syllables to acquire a H tone. Once the two H tones are adjacent, OCP is violated. The violation is repaired by shifting the subjunctive H tone to the final syllable or deleting by Rule (60). This also explains why Rule (60) is a deletion rule instead of a Delinking rule. If the H tone is delinked, it would be left floating. In languages such as Tiv, a floating L tone causes downstep (Pulleyblank 1986). We would expect floating H tones to trigger RBD as

in the perfective forms such as *ó lemile* in Sesotho. However, RBD is not triggered. We therefore conclude that the H tone is deleted, not delinked. The spreading of a H tone from the AGR to the initial syllables of toneless verb stems is not followed by RBD. Instead of RBD the subjunctive H tone shifts from the second syllable to the final syllable.

As is the case with other grammatical H tones, the Shifting rule only occurs after Tier Conflation. Tier Conflation itself is ordered with respect to Association rules. In other words, Initial H Tone Association and Grammatical H tones Association are the only processes that occur before Tier Conflation. In the case of other grammatical H tones, what is crucial is that the Spreading of a Grammatical H tone occurs after HTS and RBD. If Shifting were to occur before Tier Conflation, there would be no way we could offer the OCP as the explanation for the Shifting or the Deletion or RBD.

Having discussed the reasons behind this neutralization in the subjunctive, we now can conclude by reiterating that the rest of the other rules posited would apply whenever the structural descriptions are met. The subjunctive has the same tonal structure as the verb in the relative clauses of direct relationship (Doke and Mofokeng 1957:422). We will conclude the discussion of the subjunctive by giving examples of such verbs in (64) below

- 64(a) nna ké jáang/tswáang
 me AGR eat-REL/go out-REL
 me who eats/goes out
- (b) roná r!é rékáang/bátláang
 we AGR buy-REL/want-REL
 we who buy/want
- (c) boná b!á rékisáang/páqamáang
 they AGR sell-REL/lie-REL
 they who sell/lie down
- (d) batho bá kgúrumetsáang/kgárametsáang
 people AGR cover-REL/push-REL
 people who cover/push

In (64) we notice that the verb is characterized by a suffixal morpheme called the relativiser (REL) -ng. This suffix -ng gets Case from the verb. So, all relative verbs P-govern the REL -ng. Hence, there is no difference between a relative verb which P-governs another constituent and a relative verb which does not P-govern anything. All verbs surface with a H tone. In (64c) and (64d) it is obvious that Shifting has taken place. Neutralization of oppositions is obvious in all examples. There is just no difference between verbs which are underlyingly toneless and those which are underlyingly H-toned.

2.5 The Imperative Modality

The morphology of the imperative modality comprise the verb stem only in the singular and the verb stem plus a plurality marker -ng in the plural. The monosyllabic

examples in (65) illustrate this.

65(a) ejá/jaá	(e)jáang
STAB-eat	(STAB)eat-PL
eat	eat (PL)
(b) etswá/tswaá	(e)tswáang
STAB-go out	(STAB) go-PL
go out	go out

In (65) we have monosyllabic verbs. Each verb is characterized by a H tone on the second syllable. In addition, each monosyllabic verb is preceded by an invariable epenthetic half-close front vowel e-. There is also an option to lengthen the vowel of the verb stem instead of an epenthetic vowel e-. The H tone which surfaces on the second syllable surfaces on the second mora of the lengthened vowel.

In the plural monosyllabic verb stems are characterized by a suffixal plural marker -ng. The epenthetic vowel is optional in the plural. The second syllable still surfaces with a H tone. There is therefore complete neutralization in monosyllabic verbs which are in the imperative form. That is, the contrast between H-toned verb stems as in (65a) and toneless verb stems as in (65b) is neutralized in the imperative. Why? The association of the imperative H tone on the second syllable of the verb causes this neutralization. So, just as is true for other grammatical H tones, the imperative H tone associates with the second syllable. More evidence in support of this claim will be

advanced as we proceed with the discussion of the imperative form.

The insertion of the invariable half-close vowel e- can be explained in terms of the Minimality Condition. The minimum syllables for a phonological word in Sesotho is two if the word is not within a C-group (McCarthy and Prince 1986). In other words, since the verb stem alone makes a complete sentence, it has to have an additional syllable. In short, this supports our claim that in Sesotho the P-word is binary. Recall our discussion of reduplicated forms and our discussion of the nouns of class 9. So, the vowel which is inserted is meant to satisfy the requirements for the Minimality Condition.

It is interesting to note that the vowel which is inserted is the half-close front vowel. The half-close front vowel is one of the primary vowels in Meinhof's UR-Bantu vowel system (Meinhof (1932). This means that Sesotho uses the half-close front vowel as a default vowel. Hence, the insertion of the half-close vowel e- on to monosyllabic verb stems.

Because of the default vowel e- monosyllabic verbs in the imperative have the same number of syllables as the disyllabic verbs in (66) below.

66(a) réeka	rékáang
buy	buy-PL
buy	buy

(b) baatlá	batláang
want	want-PL
want	want

In (66a) we have a H-toned disyllabic verb stem in the singular. In the plural the suffixal plural morpheme -ng is attached. H-toned verb stems such réka (buy) are characterized by a H tone on the initial syllable and a L tone. The L tone is a result of the grammatical H tone deletion which occurs at the end of P-domain. If the verb does not P-govern other constituents as in (66), the grammatical H tone is deleted by Rule (60). Monosyllabic verbs and toneless disyllabic verbs such as batlá (66b) do not undergo this deletion rule because their initial syllables (the penult) is underlyingly toneless. In the plural the H tone is not deleted because the verbs P-govern Plural suffix -ng. Recall that the relative suffix -ng is also P-governed by the verb just as the imperative suffix -ng.

In the case of trisyllabic verb stem as in (67) below, we observe that the initial lexical H tone for H-toned verbs is not affected by the attachment of a grammatical H tone as in (67a). We know that it is outside the P-domain. The grammatical H tone spreads to the metrical head if the verb Case-assigns other constituents or remains linked on the second syllable (the head) if the verb does not P-govern anything. So, in the plural the grammatical H tone always surfaces on the last syllable because all verbs in the

plural P-govern the -ng. Toneless verbs such (66b) surface with a H tone on the second syllable. It remains anchored on the second syllable in the singular if the verb does not P-govern other constituents. If the verb P-governs other constituents, the H tone spreads to the metrical head (the final syllable).

67(a)	rékíisa	rékísáang
	sell	sell-PL/lie-PL
	sell	sell/lie down
(b)	paqáama	paqámáang
	lie down	lie down-PL
	lie down	lie down

Lastly, verb stems that have more than three syllables as in (68) below, all confirm the correctness of our analysis. The grammatical H tone is linked to the second syllable by the Association Convention. A left-headed binary metrical constituent is constructed at the right of the verb stem if the verb does not P-govern other constituents. A right-headed binary constituent is built if the verb P-governs other constituents. Tier Conflation occurs and the two planes are aligned. Grammatical H tone spreads iteratively until it reaches the metrical head. That is, for verbs that do not P-govern anything, the last syllable surface with a L tone. For those that P-govern other constituents, the final syllable surfaces with a H tone. This H tone also surfaces in all verbs which are in the plural because of the imperative suffix -ng.

68(a) kgúruméetsa	(b) kgarámétsáang
cover	push-PL
cover	push
kgúrukgúrúméetsa	kgarákgarámétsáang
cover	push-PL
cover	push

Note that in (68) we have an example of a simple verb stem and a reduplicated one. (68a) is for a H-toned verb, and (68b) for a toneless verb stem. Remember that the grammatical H tone spreads until it reaches the metrical head in each case. LBD occurs and thereby delinks the left branch of a multiply-linked H tone. Hence, the second syllable in (68a) surfaces with a L tone. That is, (68) is mere confirmation that the rules which we have posited predict correct results. Recall that verbs which have less than four syllable may not undergo LBD because the left branch is within the metrical constituent. This completes our discussion of the grammatical H tones in Sesotho.

There are some minor problems with the rules which delete H tones on verbs which do not P-govern other constituents. This deletion affects the subjunctive verb and the relative verb. These verbs are allowed to have a H tone on the penult while the ultima is also allowed to exist without any H tone inserted. This problem seems to be a consequence of the language to minimize homonymy. If insertion of a H tone were to be allowed after the deletion of the subjunctive H tone, it would imply that there would

be no difference between a P-governing subjunctive verb and a non-P-governing one. In addition, there are dialects of Sesotho where the H Insertion rule at the end of P-domain is not applied. We might therefore conclude that the answer might just be socio-historical rather than synchronic. A more in-depth study of grammatical H tones has yet to be done. Since our study covers both the NPs and VPs, it has to be taken as a mere prelude to a detailed account of grammatical H tones.

We will now briefly comment on the varieties of Sesotho spoken in other areas of Southern Africa.

3 Varieties of Sesotho

Seventy examples used in this study were given to thirty-five teachers of Sesotho. Crucial examples were those cases where Downstepping, Extratonicity, M Toning and RBD are claimed to be occurring in the data used in this study. The idea was to diagnose whether there was interdialectal agreement on domains in Sesotho. In addition, the examples included those cases where LBD occurs within a verb stem in the dialect used in this study. With LBD we were testing whether the responses to the OCP which have been claimed for the dialect used in this study could be verified in the speeches of other Sesotho speakers.

The teachers were from various parts of Southern Africa: 6 from Maluti (same dialect as the data in this study), 2 from Herschel, 6 from Soweto, 6 from Bloemfontein, 6 from Qwaqwa, 4 from the Vaal Triangle and 5 from Lesotho.

The results of the investigation are:

- (a) Except for the speaker from Harrismith who concedes to be a Zulu home language speaker, 34 speakers confirm the domains claimed in this study. That is, in examples such as *lehé lé lehólo* (big egg) there was no Downstepping of the H tone of the particle because the noun *lehé* is in a separate P-phrase from the P-phrase for the adjective *lé lehólo*. The final syllable of a noun such as *pódi* (goat) was pronounced with a L tone if the noun was modified. This means that Extratonicity was employed by all speakers at the end of P-phrases. M Toning occurred at the end of P-phrases because nouns such *mosádi* were always pronounced with a M tone at the end of P-phrases.
- (b) On the issue of the responses to violations of the OCP, the speakers could be grouped into three: a group that uses the dialect used in this study without any exceptions, a group that employs LBD where the dialect used in this study maintains the H tone as well as maintaining H tone where the dialect in this study employs LBD (Moipone's dialect -Transvaal and Free State dialect) and lastly a group which vacillates between the strategies which are employed in the dialect used in this study and the strategies employed by those who use LBD where the dialect in this study maintains the H tone.

In short, there seems to be three main varieties of Sesotho. Speakers of Sesotho in Maluti, Herschel and Lesotho invariably use a variety of Sesotho which is the same as the dialect used in this study. Speakers of Sesotho in the Orange Free State and the Transvaal use a variety of Sesotho characterized by the following:

- a sequence of H tones which has a structure as in (69) below is rectified by delinking the left branch instead of letting them remain intact as is the case in the dialect used in this study.

69 $\begin{array}{c} \text{H} \\ | \\ \text{ó} \end{array}$ $\begin{array}{c} \text{H} \\ | \\ \text{bóná} \end{array}$ <---> $\begin{array}{c} \text{H} \\ | \\ \text{ó} \end{array}$ $\begin{array}{c} \text{H} \\ | \\ \text{bóná} \end{array}$

AGR see

He sees (something)

Where the Maluti dialect employs left branch delinking as in (70) below, speakers of the Free State and Transvaal dialect speakers leave the H tones unchanged.

70 $\begin{array}{c} \text{H} \\ | \\ \text{ó} \end{array}$ se $\begin{array}{c} \text{H} \\ | \\ \text{kgúrú} \end{array}$ $\begin{array}{c} \text{H} \\ | \\ \text{metsé} \end{array}$ <---> $\begin{array}{c} \text{H} \\ | \\ \text{ó} \end{array}$ se $\begin{array}{c} \text{H} \\ | \\ \text{kgúrú} \end{array}$ $\begin{array}{c} \text{H} \\ | \\ \text{metsé} \end{array}$

AGR NEG cover

He does not cover (something)

Demuth believes that there is a tendency towards the use of the Free State and Transvaal variety among the youth in Lesotho (Demuth personal communication).

The third group involves speakers who vacillate between the two main varieties which we have mentioned.

Our intention was to indicate that the Sesotho which we have described in this dissertation is not necessarily the same as the Sesotho spoken in the Orange Free State and the Transvaal. The main difference, however, is in the strategies for repairing the violations of the OCP. We have no reason to believe that we have done an empirical study of the problems of language varieties in Sesotho. Such an empirical investigation has yet to be done.

4 Conclusion

This dissertation has revealed several aspects regarding the tonology of Sesotho. Among the many, the most important feature of the grammar of Sesotho is that the OCP is central in the grammar. The OCP plays a role in the underlying representations, in the assimilation and the dissimilation of tones.

Besides the OCP, this study has demonstrated that prosodic domains are crucial. We have illustrated that while different strategies to repair the OCP are employed in the language, these strategies are constrained by the prosodic structure. For instance, we have shown that within a phonological word level, violations of the OCP are repaired by Meeussen's Rule, at the sub-juncture within the Clitic Group by Fusion or Left Branch Delinking, within a Clitic Group or a phonological word by Right Branch Delinking, and lastly, between two Clitic Groups which are within one phonological phrase by Downstepping.

The perplexing paradoxes regarding the HL versus the HH

and the HM versus HL tonal patterns in Sesotho have been solved. We have illustrated that the solution lies mainly in the prosodic structure. Regarding the M tone versus the L tone we have demonstrated that the L tone instead of the M tone is a default tone in Sesotho. In particular, the M tone has been proven to be a single H tone in the underlying structure which is preceded by a F tone on the penult.

Lastly, we have demonstrated that tonological evidence can be decisive in establishing the status of constituents in Sesotho. For instance, we have come to the conclusion that the class prefix in gerundive nouns receives the external theta role. Also, we have established that an inverted subject NP is, in fact, in its base form in the VP node. In other words, the position which the subject NP which is not inverted occupies, is a derived position. The subject NP moves to this position in order to acquire Case from the AGR.

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