ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

THE SYLLABLE STRUCTURE AND SYLLABLE BASED MORPHOPHONEMIC PROCESSES IN DORZE: REPRESENTATIONS BASED ON MORAIC PHONOLOGY

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Symbols and Abbreviations

V	Vowel
C	Consonant
L	Liquid
G	Glide
N	Nasal or Node or Nucleus
n.d	No date
n.p	No page
σ	Syllable node
μ	Mora
α	A slot for a segment
/ /	Phonemic Representation
[ ]	Phonetic Representation
O	Onset
R	Rhyme
C	Coda
— C	Pre consonantal slot
C —	Post consonantal slot
⟶	becomes
mas	masculine
sg	singular
3	Third person
Ø	Deletion
WbP	Weight by Position
CL	Compensatory Lengthening
vl	Voiceless
vd	Voiced
imp	Implosive
ej	Ejective

Abstract

The objective of this study was to describe and discuss the syllable structure and syllable based morphophonemic processes in Dorze. The language under study, Dorze, is an Omotic language spoken in the Southern Nations, Nationalities and Peoples Region.

The methodology used is an informant method where data were recorded and elicited from informants.

It has been identified that Dorze has 26 consonant and 5 vowel phonemes. Vowels /ɨ/ and /ə/ are variants of /i/ and /e/ respectively. As discussed in chapter two, there are also cases of consonant gemination and vowel lengthening in which both are contrastive. Regarding the syllable types, there are 8 kinds of syllable shapes identified for Dorze: V, CV, CVC, CVVC, CVCC, CVVCC, VC and CVV. Furthermore, both heavy and light syllable shapes are also found.

The theoretical framework employed to analyze the syllable structure was the Moraic account of Autosegmental phonology. The Moraic theory claims that the only intervening element between the syllable node and the segmental root node is the mora. The concept of heavy and light syllable is also another assumption that is used to best explain segmental length distinctions. It also claims that there is a case of compensatory lengthening involving deletion of a segment and lengthening of another so as to compensate for the deleted segment.

Syllable and syllable related issues were also treated. More specifically, basic constituents of the syllable, types of the syllable, phonotactic constraints and syllabification processes in light of the Moraic theory were discussed. Following Clements and Keyser (1983), Dorze is identified as type IV language where a vowel alone can constitute a syllable. Furthermore, the phonotactics of Dorze was also discussed where onset is an optional element and is filled by only one segment while a maximum of two consonants are allowed at syllable final position.

According to the proponents of the Moraic phonology, vowels are underlyingly Moraic; short vowels and geminates take one mora while long vowels take two moras. The CVC syllable is light by default, but it can be considered as heavy in terms of Weight by Position rule if cluster of heterogeneous consonants or geminates are found.

It has been identified that there are morphophonemic processes that base their application on syllable as their domain. These include assimilation, deletion, insertion, suffixation and reduplication. Such processes contribute for syllable weight, compensatory lengthening etc in light of the Moraic phonology.

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Chapter One: Introduction

1.1 Background of the Study

1.1.1 The People

The Dorze are a small ethnic group in Ethiopia who speak a language in the Omotic family numbering approximately 28,000[1] (http://en.wikipedia.org/wiki/Dorze). They live primarily in the Southern region of the country, though some have migrated to Addis and other regions. Burley (1978:145) on the Dorze people migration to Addis Ababa states:

> The population of Shiro Meda is made up of almost entirely of people from the Gamu highlands. Throughout Addis Ababa, Shiro Meda is known as the "Dorze" or weaving community ... Captives from the Gamu highlands were brought to Addis Ababa by Hapte Giyorgis, one of Menelik's generals, and settled in the area of Shiro Meda, which he owned.

Many Dorze live in villages near the cities of Chencha and Arba Minch, which are located in the North Omo Zone of the Southern Nations, Nationalities and Peoples Region (formerly in the Gamu-Gofa province).

Dorze is the name of both the people and the language. Regarding this Haile Eyesus (1981:1) attests: "Dorze is a name of a people who live in the province of Gamu Gofa, to the North of Arba Minch. The language they speak is also called Dorze" According to my informants, Dorzetso is also used by the community to name the language.

The primary occupation for many Dorzes' is weaving. Concerning this Burley (1978:147) has the following to say:

> Why then has "Dorze" become an inclusive occupational level? There are at least two possible explanations. First, the Dorze may have been brought to Addis Ababa, and when subsequent Gamu people migrated to the city they were attracted to those who spoke the same language and has [have] similar

[1] Note that the 2007 population census report does not show population size at kebele and municipality levels. But, according to the telephone conversation made with Ato Getahun, head of Dorze municipality, the municipality has 12 kebeles and a total of 64,113 people.

customs. A second explanation is that the Dorze were the most skilled weavers and therefore other Gamu people who came to the city attached themselves to the Dorze in order to assure a market for their weaving.

1.1.2. The Language

Many of the languages of Ethiopia belong to the Afro-asiatic language phylum which consists of Semitic, Omotic and Cushitic families of languages. A significant number of Ethiopian languages also belong to the Nilo-Saharan language phylum. Fleming cited in Bender (1976:34) remarks: "Most of the languages spoken in Ethiopia belong to the large Afro-asiatic supper family. Most of these belong to the Cushitic or Omotic families, with a smaller number being Semitic."

The Omotic languages that are spoken in Ethiopia, according to Fleming cited in Bender (1976:47), are classified under Western and Eastern Omotic branches. The Western Omotic is divided into Maji languages and Kefa-Gimojan group of languages. The Kefa Gimojan is splited into Kefa languages and Gimojan. The Gimojan further splits into Gimira, Janjero [Yem] and Ometo-Cluster. Dorze is one of the Ometo Cluster languages. According to Ethnologue report, Dorze has lexical similarities with a number of Omotic languages: 82% to 87% with Gamo, 77% to 81% with Gofa, 80% with Wolayta, 73% to 75% with Kullo/Dawro, 54% with Koorete and 48% with Maale. (http://www.ethnologue.com/show_country.asp?name=et)

The following diagram shows the classification of the languages of the Omotic Cluster within the Omotic language family.

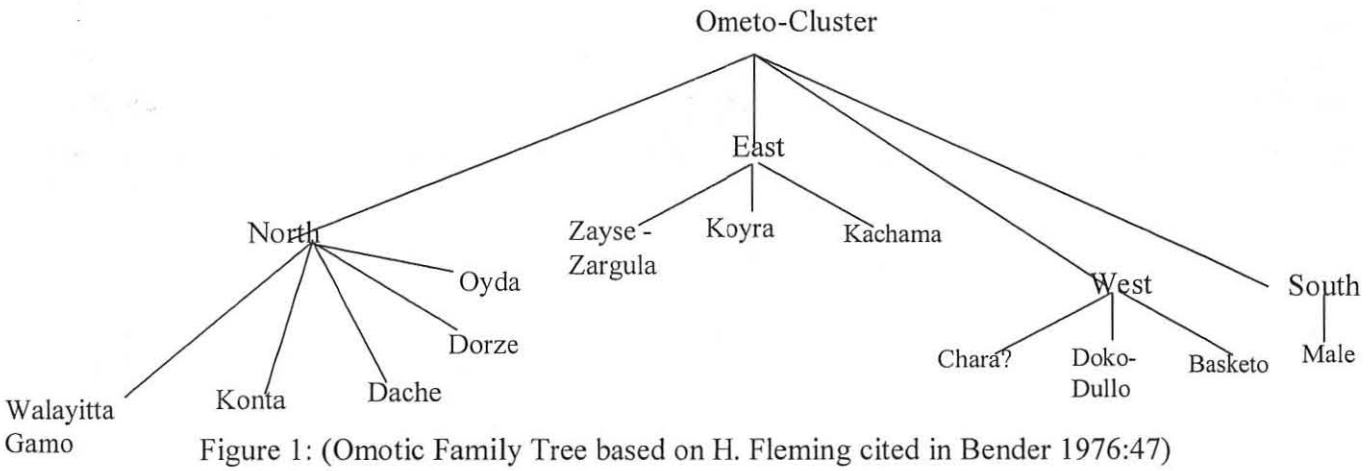


Figure 1: (Omotic Family Tree based on H. Fleming cited in Bender 1976:47)

1.2. Rationale of the Study

There are numerous reasons that made me build up a scholarly interest to explore the syllable structure and syllable based morphophonemic processes in Dorze.

In the first place, research works on the phonology of Dorze are rare as to the best of my knowledge. Due to this, I wonder to look at the syllable structure of the language.

Secondly, I have a keen interest to explore other phonological, morphological and syntactic aspects of the language. So that, I hope the present study will serve me as a starting point to learn the basics of the language for my further studies on the language.

On top of that, the morphophonemic processes of the language were not considered in Haile Eyesus's work. Therefore, I think that this is a gap to be filled.

Generally speaking, the absence of adequate study on the phonological aspects of the language and the keen interest I have on phonology in general attracted me to go into the details of the syllable structure and morphophonemic processes in Dorze.

1.3. Objectives of the Study

The study has both general and specific objectives.

1.3.1. General Objectives

The general objectives of the study include:

- studying the basic syllable structure of Dorze using Moraic theory of syllable representation;
- unfolding the basic morphophonemic processes that undergo in the language.

1.3.2. Specific Objectives

The research encompasses the following specific objectives. It focused on:

- identifying possible syllable types of the language;
- finding out the syllabification processes of the language based on Moraic theory of syllable structure;
- elaborating on the phonotactics of Dorze;
- pointing out the central morphophonemic processes that undergo in the language in light of the Moraic theory.

1.4. Scope of the Study

The study focused on the syllable structure and syllable based morphophonemic processes. The source of the data is basically a field work conducted in two different places. First, I collected data from Dorze speakers who are dwelling at Shiro Meda, Addis Ababa for my preliminary analysis because they migrated from Chencha. As Burley (1978:147) states, "... the majority of weavers living in Shiro Meda are from Chencha, even though it is called the 'Dorze' area of Addis Ababa." Second, I conducted field work to gather data for the main research work from the native speakers who are living in Dorze town, which is located at 30 kilometers from Arbaminch.

Based on the field data, I made a detailed investigation on the various aspects of the syllable including finding out the permissible cluster of segments, the various restrictions on syllable distribution, describing the basic syllable structures and types respectively. Besides, I investigated the syllable based morphophonemic processes operating in the language.

1.5. Significance of the Study

The study outcome is believed to have the following contributions:

- It is expected to add to our knowledge of Dorze by providing some important phonological information on the language;
- It is assumed to supply an input for other researchers who want to walk around other aspects of the language; and
- In a broader sense, it will contribute to the documentation of the language as well as the development of the language for various purposes such as mother tongue education.

1.6. Previous Studies

As far as my knowledge goes, there are some works that are done on various aspects of the language. Amongst them, there are two works on the morphology of the language: "The Verb Phrase in Dorze" by Adane Feleke (2001) and "Dorze Verb Morphology: Some Inflections and Derivations" by Yesigat Assaye (1988). Both works were done as partial fulfillment for the requirement of Bachelor of Arts in Linguistics. As Beletu (2006: 76) briefly stated in her annotated bibliography, Yesigat's thesis has tried to show some inflections and derivations of the verb in Dorze spoken in Chencha province of Gamu Gofa region.

With regard to phonology, there is only one piece of work — Haile Eyesus's "A Phonetic and Phonemic Study of Dorze". His work consists of six chapters: the Segmental Phones of Dorze, the Segmental Phonemes of Dorze, the Suprasegmentals of Dorze, the Syllable Structure of Dorze, Phonemes: Co- occurrences and their Distribution and Summary and Conclusion. Further, it includes bibliography and appendix.

Haile Eyesus has identified 25 consonants and 5 simple vowels. Of the 25 consonants, 10 are stops, 4 fricatives, 5 affricates, 2 nasals, 2 liquids and 2 glides. Concerning the suprasegmentals, he has mentioned consonant length, vowel length, stress, and the intonation pattern of Dorze.

Regarding the syllable structure, he made a distinction between syllables with simple nuclei and complex nuclei. He further explored open [V, CV, NV, LV, GV] and closed syllables [VC, VN, VL, CVC, CVN, NVC, CVL, GVN] where N, L and G represent nasal, liquid and glide consecutively. He also described word medial syllable types, word final syllable types etc. By and large, he has also stated phoneme co – occurrences and their distribution like consonant sequences, diphthongs and phoneme distribution in Dorze.

There might be a question here: What makes the present work different from the previously work done by Haile Eyesus? The earlier work of Haile Eyesus entitled "A Phonetic and Phonemic Study of Dorze", for instance, is a descriptive work, whereas the present work focuses on syllable structure and morphophonemic processes based on a

theory called Moraic Phonology. I believe that embarking on the theoretical aspect, based on the descriptive facts, will explain a number of issues within the phonology of Dorze and beyond. The similarities between his findings and mine are that there are 2 nasals, 2 liquids and 2 glides. Concerning differences, he identified 10, 4 and 5 stops, fricatives and affricates respectively, but in my study, I have identified 11, 5 and 2 only. The number of vowel phonemes I identified matches with his findings. Moreover, he treated suprasegmental features like stress and intonation, but my study was limited to the syllable and syllable based morphophonemic processes.

There are also other works done on Dorze. For instance, Bikale Seyoum has prepared an article entitled "በአዲስ አበባ በአንድ ቀበሌ የሚገኝ የዶርዜ ማህበረሰብ ልሳነ-ክልኤ አባላት" "Bilingual Members of the Dorze Community Found in a Single Kebele in Addis Ababa" in 1986/7. He discussed the language use of the Dorze living in Addis Ababa in a multi-ethnic and multi-cultural setting. Besides, he also assessed the status of migration of the Dorze community and their life. On the other hand, Burley's work entitled "The Despised Weavers of Addis Ababa" discussed the history of the Gamu Highland Weaving Community in Addis Ababa. He further studied why the Gamu highland people became the principal weavers in Addis Ababa.

1.7. Research Methodology

To achieve the above objectives stated under 1.3, I followed the following research methodology. First of all, I made library readings on related works on the language. Following this, I went out for field work. I employed informant method where informants were interviewed and the data were cross checked for validity and reliability. To do so, I made use of the SIL Comparative African Word List (1700 words) which is adapted for Ethiopian context by Andreas Joswig. Further, when necessary, more lexical items were used to substantiate the findings. To fill gaps, paradigms were recorded. Based on the data, the theoretical analyses were made. The data were recorded using the Speech Analyzer 3.0.1 because I found it important to easily use slowed playback to check for transcription.

1.8 Theoretical Framework

1.8.1 Introduction

There were other theories before the coming of Moraic theory of the syllable structure. In all previous phonological theories, the syllable has been given varying degree of attention. In the work of Chomsky and Halle 1968 'The Sound Pattern of English', for instance, the notion of syllable as a phonological unit was ignored. Durand (1990:198) states:

> Chomsky and Halle, in their attempt to provide formal foundations for phonology, neglected the existing tradition of work on the syllable limiting their attention to strings of segments, their internal structure and operations on segments and features.

Kreidler (2001:1) further emphasizes on the issue that the syllable was neglected. He says:

> The notion of a syllable has been around for [a] millennia, but it has been given different degrees of importance as a phonological unit in different phonological theories and different language descriptions. The rules proposed by Chomsky and Halle 1968, for instance, make no use of the term.

In other words, the SPE model of Chomsky and Halle did not recognize the fundamental role of a syllable as a phonological unit. Scholars suggested a number of reasons to argue that the syllable is unnecessary in phonology. Hyman (1975:192) says that because syllable boundaries can be determined automatically from universal principles and language specific facts about the segments contained in the syllables, generative phonologists have largely worked under the assumption that the syllable is unnecessary in phonology.

Scholars such as Kohler (1966) Hall (2006) and Clements and Keyser (1983) also argue that the syllable is either unnecessary or an impossible concept. To the very extreme, they also argue that syllable is harmful.

Kohler (1966: n.p), for example, remarks:

> The syllable is very often regarded as a substantitive universal in phonology; but it can be demonstrated that the syllable is either an UNNECESSARY concept, because the division of the speech chain into such units is known for other reasons, or an IMPOSSIBLE one, as any division would be arbitrary, or even a HARMFUL one, because it clashes with grammatical formatives. If the syllable has any real status in phonology, its boundaries must be discernible.

Even though the role of the syllable was disregarded most notably by Chomsky and Halle, a number of researchers before and after the SPE recognized its importance. Hall (2006:329) supports this idea as: "Although the role of the syllable as a phonological unit was denied in Chomsky and Halle (1968), a number of researchers both before and after recognized its importance". To support this idea with words of generativists, Clements and Keyser (1983:1) stress that the omission of the syllable from phonology was a severe one and they recognize how much syllable is crucial to account for phonological rules as follows:

> Until very recently, generative phonology was premised on the notion that phonological representation consists of linear strings of segments with no hierarchical organization other than that provided by syntactic phrase structure. In particular, the notion syllable was thought to play no role in phonological organization. However, there has been increasing evidence that the exclusion of the syllable is a *serious omission* in generative phonology and that many phonological rules only receive appropriate formulation in terms of this notion. As a consequence some generative generativists have proposed to integrate the syllable into revised versions of phonological theory.

1.8.2 The Importance of the Syllable as a Phonological Unit

Contrary to the view of Chomsky and Halle who ignore the syllable structure and Kohler who strongly opposes its recognition as a phonological unit, there are a number of arguments in favor of the syllable as a phonological constituent. Among the known scholars, Blevins (2001:76) states the following basic arguments. (a) ***syllable as domain*** - there are phonological processes and/or constraints which take the syllable as their domain of application, (b) ***syllable edges as locus*** - the existence of phonological rules that apply at syllable edges. In all languages, syllable edges correspond with word/utterance edges, (c) ***syllable as target structure*** – syllables can also function as targets of language game or as prosodic targets in morphological processes like reduplication. (d) ***native intuition*** – in a number of languages, native speakers have clear intuitions regarding the number of syllables in a word or utterance, and in some of these, generally clear intuition as to where syllable breaks occur.

Moreover, Fudge (2001), and Hall (2006) have a firm belief that the syllable is a phonological universal. Fudge (2001:253), for example, elaborates the function of the syllable by describing its twofold function. The syllable according him,

> (a) **provides a basis for distinctive prosodic features:** Even where tone – or stress - elements are not directly attributable to syllable, their domains (morae, etc) will be related to syllables; and
>
> (b) **accounts for constraints on possible phoneme sequences...** some of these constraints are accounted for by setting up a syllable structure and then postulating different systems at different places in the structure; in other cases, the choice of a particular element at one place affects the range of choice of another place.

Likewise, Hall, remarks that syllable is a necessary concept because many phonological generalizations can be made by referring to it. Besides, other phonological properties like stress and tone take the syllable as their domain. Durand (1990:199) also affirms the need for a syllable unit in terms of its significance to account for phonotactic constraints. "Medial consonantal clusters turn out to be extraordinarily complex if dealt within isolation from the syllable...The answer is to be found in the possibility of parsing medial clusters in terms of acceptable syllable-beginnings (onsets) and ends (codas)".

Blevins (2001:75) further states: "The role of the syllable in phonological theory has become more significant with each passing decade. All major approaches to phonology... including autosegmental and metrical phonology have recognized the syllable as fundamental unit in phonological analysis".

From all the above quotes, it is possible to understand that a number of theories are recognizing the syllable considering its relevance as a phonological unit. The Moraic theory is among them.

1.8.3 Moraic Theory

Moraic phonology is a theory which gives due focus for Mora. Mora can be defined as a unit of measurement in phonology. It is used to determine syllable weight.

1.8.3.1 How is the Moraic Theory Different from Other Competing Theories?

According to Shaw (n.d), works of phonological representations in the 1980s led to a paradigm shift from slot-based theory of timing (Clements and Keyser 1983) to weight based theories.

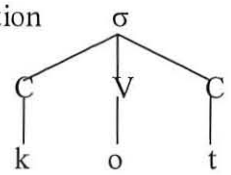
Other theories like CV theory and X theory can be characterized as segmental theories of the prosodic tier: the number of prosodic elements in an utterance corresponds intuitively to the number of segments it contains. Rubach (2001:228) elaborates the areas of focus among different accounts for syllable structure as follows:

The CV theory of Clements and Keyser assumes the vowels and consonants have V and C slots respectively. Thus, the Polish word *kot* 'cat' is represented as follows:

(1) CV SKELETON

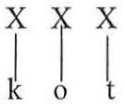
a. before syllabification

b. after syllabification



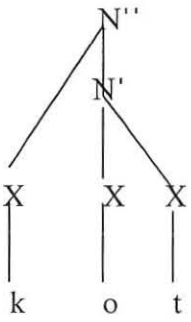
The X theory of Levis does not distinguish between vocalic and consonantal slots. Both are represented identically as X-slots. The distinction between vowels and consonants is made solely in terms of syllable structure: vowels are assigned the nucleus node N, while consonants are linked to the syllable node N'' if they are in the onset and to the rhyme node N' if they are in the coda.

(2) X - SKELETON



a. before syllabification

b. after syllabification



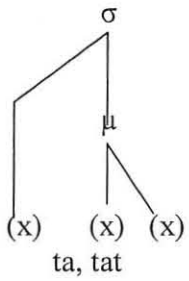
Hyman and McCarthy and Prince, cited in Hayes (1989:254), have suggested a more radical proposal. The prosodic tier they favor has just one kind of unit, as in X theory, but instead of representing a segment, this unit represents the traditional notion of mora. "Moraic theory is not a segmental theory, as there is no level at which segment count is depicted".

1.8.3.2 Major Claims of the Moraic Theory

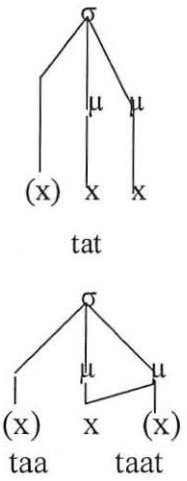
There are a number of claims associated to the Moraic theory of the syllable structure. The first and fundamental claim attested by Lawrence (2006:1) is that the only element intervening between the syllable node and the segmental root node is the mora. Under this approach, the syllable contains neither an onset nor a rhyme. Instead, every syllable contains one or more moras (μ) as shown below.

Hayes (1989)

a. Light Syllable



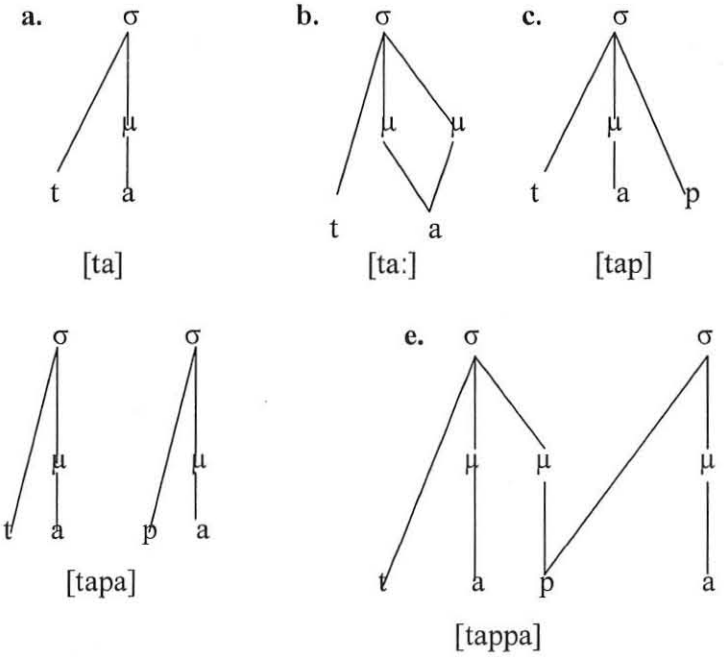
b. Heavy Syllable



The concept of heavy and light syllable is another assumption of the Moraic theory. Notice that the distinction between a heavy and light syllable is expressed entirely by the number of moras in the syllable; the segment count is a feature of CV and X tier phonological approaches for the syllable structure.

The third assumption is that the notion of mora has a dual role in this theory: it is a basic unit for syllable weight and at the same time, it is used to express segmental length distinctions. (Hayes, 1989:254; Ehala 2003:59).

According to Cohn (2003:75), the Moraic representation of geminates is structurally distinct from that of long vowels.... Following the Moraic view, the inherent property of geminate consonants is their moraicity.



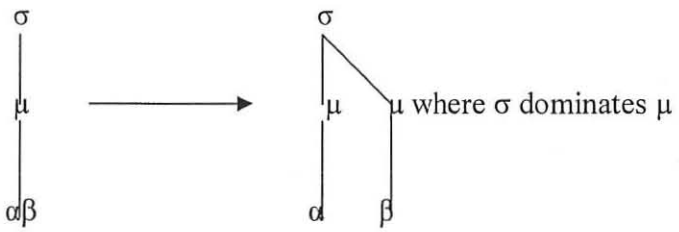
The second role according to Ehala (2003:59) is achieved by the following set of conventions:

a) short vowels have no mora;
b) long vowels have two moras;
c) short consonants are moraless;
d) long consonants and geminates have one mora;
e) glides are moraless;
f) segments in syllable onsets are moraless;

He further makes generalizations as follows: "From each convention it follows that syllable weight is a linear function of segment length. This means that CV syllables are always light (i.e. monomoraic) and CVV syllables always heavy (bimoraic). CVC

syllables are light by default, but in languages where CVC works as heavy, the coda consonant is assigned a mora by rule of weight by position (WbP)". WbP is a language specific rule which renders closed syllables heavy in certain languages. It is formulated to produce syllables with a maximum of two moras. This is a strong claim; it says that distinctions of syllable weight are at most binary. The basic idea according to Hayes (1989:258) is that certain coda consonants are given a mora when they are adjoined to the syllable, by the following rule schema.

Weight by Position



The fourth crucial argument in favor of Moraic theory came from compensatory lengthening (CL), a phenomenon involving deletion of a segment and lengthening of another, often, adjacent segment. As a consequence, the theory predicts that languages with CL processes are restricted to those in which coda consonants contribute weight to the syllable.

The fifth claim is that Moraic structure of languages can vary. As Hayes (1989:255) states, for instance, in some languages (such as Latin) CVV and CVC syllables count as heavy and CV as light; whereas in others (such as Landrail) only CVV is heavy and both CVC and CV are light. He further said that the claim of Moraic theory is that these languages differ in their rules for assigning Moraic structure. He further elaborates that languages that exhibit a syllable weight distinction typically also have a vowel length distinction, and vice versa. Likewise, he explains the existence of language particular Moraic structure as an important part of the theory because it predicts that in the absence of additional adjustment rules, the same criterion of syllable weight will be relevant throughout the phonology of a single language.

1.8.3.3 Shortcomings of the Moraic Theory

There is no air tight and agreeable theory for treating syllable weight. Thus, the Moraic phonology is also criticized for its weaknesses as follows. Ehala (2003:77) remarks:

> Moraic theory however treats weight as totally dependent on segmental structure, i.e. it has also a duty to represent segmental length. As there are more combinations of segmental length that attested possibilities of syllable weight, it is one of the main reasons why there is yet no satisfactory theory of calculating syllable weight form the segmental structure of syllables.

One additional domain which can be considered as a weakness of the Moraic account for the syllable structure is that it ignores onsets. Lawrence (2006:1) further argues, "Since the weight distinction generally ignores onsets, it cannot be expressed in terms of the number of segments in the syllable".

1.8.3.4 Why do I choose the Moraic Theory in the Present Study?

Though, like any other theories, the Moraic theory of autosegmental phonology is criticized, as stated in section 1.8.3.3, it has been chosen for a number of reasons. It is a phonological theory that gives emphasis to the representation of syllable weight, vowel lengthening, gemination, compensatory lengthening etc. As Haile Eyesus (1981) identified in his descriptive work and I also agree, there are features of consonant cluster (cluster of heterogeneous sounds), geminates (cluster of homogenous sounds), and vowel length in Dorze. Therefore, Moraic phonology is preferred in this study to best represent geminates and vowel length and other related facts. For instance, in /lappun/ 'seven' and /s'uuns/ 'fingernail', the word medial geminate and vowel length respectively become mora bearing units.

Chapter Two

General Description of the Phonology of Dorze

In this section, an attempt has been made to identify and give a brief description of the speech sounds of Dorze. The description of consonant sounds comes first and then the description of vowels follow. The transcription of the speech sounds is made using the IPA Unicode 1.0.5 Keyman Keyboard developed by Martin Hosken, SIL Non-Roman Script Initiative (NRSI) format in accordance with the IPA conventions as revised in 2005.

2.1 Consonant Phonemes

Haile Eyesus (1981) identified 25 consonant phonemes in his segmental phoneme inventory of Dorze. In his study, he identified /ts/ as voiceless, dental alveolar, affricate, /č/ as voiceless palatal, affricate, /ts'/ as voiceless, dental alveolar, affricate, while / č'/ is voiceless, palatal, affricate. In this study, using the IPA Unicode, /c/ is considered as voiceless, palatal, affricate, instead of /č/ and /ts/. Besides, /c'/ is preferred and used as a substitute for /ts'/ and / č'/ for consistency. Therefore, the number of phonemes he identified is less by two.

The present study came up with three additional consonant phonemes to what Haile Eyesus recognized. These are /s'/, /f/ and /ɸ/. The description of each sound is presented under section 2.1.1.

The chart presented below displays the consonant phonemes of Dorze.

		Bilabial	Labiodental	Alveolar	Alveo-palatal	Velar	Glottal
Plosive	vl	p		t		k	ʔ
	vd	b		d		g	
	ej	p'		t'		k'	
	imp			ɗ			
Fricative	vl	(ɸ)	f	s	ʃ		h
	vd			z			
	ej			s'			
Affricate	vl				c		
	ej				c'		
Nasal	vd	m		n			
Liquids				l			
				r			
Glides		w			j		

Table 1: Consonant Phonemes of Dorze

The first group of consonants includes plosives. Dorze has four voiceless plosive sounds: /p/, /t/, /k/ and /ʔ/. The voiced counterpart is less in number by one because /ʔ/ has no voiced matching sound. These comprise /b/, /d/ and /g/. All voiceless plosives have ejective counterparts like p', t' and k' respectively except ʔ. ɗ is a voiced consonant.

The second group consists of fricative consonant phonemes where there are five voiceless sounds including /ɸ/, /f/, /s/, /ʃ/ and /h/. It is only s that has a voiced and ejective counterparts /z/ and /s'/ respectively.

There are only two affricate sounds. These are c which is alveo - palatal and its ejective counterpart c'.

The fourth category contains only nasals — the bilabial /m/ and the alveolar /n/.

The fifth category includes two alveolar liquid sounds /l/ and /r/. The last group of consonants includes the glides /w/ and /j/.

2.1.1 Description of the Consonant Phonemes

Phonemic differences are tasted in different ways such as looking for the distribution of each sound and minimal pair test. In this section, it has been attempted to describe the phonemes of Dorze based on distribution. Distribution is all about environment of occurrence. According to Carr (2008:124), an environment is a specific structural slot in which a sound can occur, such as the onset of a syllable, or word-initial position, or intervocalic position.

The description of each sound is made based on the pattern of voicing condition, place of articulation following by manner of articulation. For sounds like /p'/, /t'/, /s'/, /c'/ and /k'/, 'ejective' is considered as a third parameter. Since Dorze has only one implosive sound /ɗ/, it is described as voiced implosive.

1. /p/ voiceless, bilabial, plosive

Examples:	/pendərs/	'lip'
	/pas'a/	'(be) healthy, well'
	/ospun/	'eight'
	/ʃampo/	'rest'
	/lappun/	'seven'
	/k'oppirəs/	'think'

2. /b/ voiced, bilabial, plosive

Examples:	/bitta/	'sand'
	/boʔots/	'white'
	/ʔarba/	'Friday'
	/habəba/	'flower'
	/babbo/	'fear'
	/ʔabba/	'lake'

3. /p'/ voiceless, bilabial, ejective

Examples:	/p'up'p'ule/	'egg'

4. /ɸ/ voiceless, bilabial, fricative

Examples:	/ʔajɸe/	'eye'
	/ʔaɸuns/	'tear'
	/kəɸo/	'bird'
	/gəɸo/	'hunger'

5. /m/ voiced, bilabial, nasal

Examples:	/mək'ets/	'bone'
	/mits/	'tree'
	/namitam/	'twenty'
	/hedzitam/	'thirty'
	/ospuntam/	'eighty'
	/nammis'et/	'two hundred'

6. /w/ voiced, bilabial, glide

Examples:	/wədoro/	'thread'
	/wəsanca/	'beggar'
	/ʃawho/	'soft'
	/ʔawəza/	'pap'
	/ʔawa/	'sun'

7. /f/ voiceless, labiodental, fricative

Examples:	/k'ufirəs/	'cough'
	/k'efo/	'wing'

8. /t/ voiceless, alveolar, plosive

Examples:	/tire/	'liver'
	/tanbo/	'tobacco'
	/təma/	'five'
	/s'et/	'hundred'
	/ɒlatto/	'fight'
	/bitta/	'sand'

9. /d/ voiced, alveolar, plosive

Examples:	/des'o/	'hard'
	/dors/	'sheep'
	/gudulo/	'dust'
	/hadris/	'left'
	/giddots/	'midnight'

10. /t'/ voiceless, alveolar, ejective

Examples:	/t'ans/	'breast'
	/t'ok'ərs/	'frog'
	/int'ərs/	'tongue'
	/ilint'ərs/	'guts'

11. /ɗ/ voiced, alveolar, implosive

Examples:	/k'ooɗe/	'neck'
	/orɗe/	'fat'
	/maldɔ/	'sweat'
	/baɗala/	'maize'

12. /s/ voiceless, alveolar, fricative

Examples:	/suts/	'blood'
	/səlo/	'sky'
	/katsirəs/	'cook'
	/kəsirəs/	'vomit'
	/pendərs/	'lip'
	/t'ans/	'breast'
	/issino/	'one'
	/kasse/	'yesterday'

13. /z/ voiced, alveolar, fricative

Examples:	/zokko/	'back'
	/zoʔo/	'red'
	/wəzana/	'heart'
	/majze/	'grand parent'
	/wəggaz/	'big'
	/miiz/	'cow'

14. /s'/ voiceless, alveolar, ejective

Examples:	/s'uuns/	'fingernail'
	/s'os/	'God'
	/kas'ojle/	'big hoe'
	/pas'a/	'(be) healthy, well'
	/wəs's'irəs/	'run (3 mas sg)'

15. /n/ voiced, alveolar, nasal

Examples:	/namʔa/	'two'
	/naʔa/	'child'
	/konke/	'forehead'
	/dinke/	'drum'
	/lappun/	'seven'
	/ʔospun/	'right'
	/ʔajnno/	'noon'
	/dinnicco/	'potato'

16. /l/ voiced, alveolar, lateral approximant

Examples:	/loʔo/	'good'
	/lage/	'friend'
	/galba/	'skin'
	/bale/	'feather'
	/gullʔa/	'navel'
	/zallanca/	'trader'

17. /r/ voiced, alveolar, flap

Examples:	/zərets/	'seed'
	/durirəs/	'dance'
	/ʃuʔirəs/	'sing'
	/marr/	'calf'

18. /ʃ/ voiceless, alveopalatal, fricative

Examples:	/ʃucc/	'stone'
	/ʃawho/	'soft'
	/kaʃe/	'hand'
	/ʃoʃ/	'snake'
	/ʔiiʃ/	'brother'
	/t'iʃirəs/	'sneeze'

19. /c/ voiceless, alveopalatal, affricate

Examples:	/ʔicacc/	'five'
	/ʔocirəs/	'ask (3 mas sg)'
	/ʔaacəre/	'spider'
	/buuc/	'beard'
	/ʔacci/	'teeth'

20. /c'/ voiceless, alveopalatal, ejective

Examples:	/c'ucc/	'saliva'
	/c'unc'ale/	'ant'
	/c'ərk'o/	'wind'
	/gəc'o/	'chin'
	/mac'as/	'woman'

21. /j/ voiced, alveopalatal, glide

Examples:	/jəkkirəs/	'weep'
	/jirəs/	'come (3 mas sg)'
	/waje/	'ear'
	/s'ojle/	'small hoe'

22. /k/ voiceless, velar, plosive

Examples:	/konke/	'forehead'
	/kuʃe/	'hand'
	/kalta/	'axe'
	/iske/	'hair'
	/ʃanka/	'hunter'
	/zokko/	'back'
	/sikkirəs/	'sew'

23. /g/ voiced, velar, plosive

Examples:	/ gacˈo/	'thin'
	/galba/	'skin'
	/sˈugirəs/	'burn'
	/sugirəs/	'push'
	/gege/	'tortoise'
	/wəggaz/	'big'

24. /kˈ/ voiceless, velar, ejective

Examples:	/kˈese/	'elbow'
	/kˈefo/	'wing'
	/sˈinkˈo/	'bad smell'
	/tˈokˈərs/	'frog'

25. /ʔ/ voiceless, glottal, stop

Examples:	/ʔacci/	'teeth'
	/ʔajɸe/	'eye'
	/ʔaas/	'man'
	/namʔa/	'two'
	/zoʔo/	'red'

26. /h/ voiceless, glottal, fricative

Examples:	/hare/	'donkey'
	/hoʔo/	'hot'
	/hats/	'water'
	/hajsa/	'this'

2.1.2. Minimal and Near Minimal Pairs

In this section, it has been tried to show phonemic distinction by using the minimal pair test. As cited in McMahon (2002:53), for Charles Hockett, an influential American linguist of the mid-twentieth century who contributed the development of phonemic theory, "Minimal pairs are the analyst's delight and he seeks them whenever there is any hope of finding them." Minimal pairs are pairs of words which have identical form except at one single point where the presence of one rather than the other may bring meaning difference (Carr (2008:125), Trask (2007:170)).

The following minimal and near minimal pairs demonstrate phonological contrasts between or among consonants that have been found for Dorze.

1. **/b/ /ʔ/ /k/**

/beʔirəs/	'see'
/ʔeʔirəs/	'stand'
/keʔirəs/	'exit'

2. **/k/ /d/**

/kana/	'dog'
/dana/	'beer (traditional)'

3. **/s/ /s'/**

/suns/	'name'
/s'uns/	'narrow'
/sugirəs/	'pushes (3rd mas sg)'

4. **/c'/ /ʃ/**

/c'ucc/	'saliva'
/ʃucc/	'stone'

5. **/z/ /l/ /h/**

/zoʔo/	'red'
/loʔo/	'good'
/hoʔo/	'hot'

6. **/b/ /ʔ/**

/bitta/	'sand'
/ʔitta/	'bad'

7. /**h**/ /**k**/

/hats/	'water'
/kats/	'grain'

8. /**d**/ /**b**/

/dacco/	'basket'
/bacco/	'fox'

9. /**m**/ /**b**/

/mats/	'honeybee'
/bats/	'a big local water container'

10. /**ʃ**/ /**k**/

/ʃoʃ/	'snake'
/koʃ/	'shadow'

11. /**k**/ /**d**/

/karo/	'tip'
/daro/	'many'

12. /**m**/ /**k**'/

/**m**ata/	'grass'
/**k**'ata/	'cover of a bamboo tree'

There are also near minimal pairs as illustrated below.

13.	/tire/	'liver'
	/t'ile/	'floor'
14.	/wəgga/	'sunday'
	/wənta/	'morning'
15.	/babbo/	'fear'
	/ʔabba/	'lake'

2.1.3 The Distribution of Consonant Phonemes

In this section, it has been tried to reveal the different positions of phonemes in words, geminate forms and cluster formation. The presentation is made based on the manner of articulation of speech sounds. These are plosives, fricatives, affricates, nasals and liquids and glides. Each group includes the distribution of phonemes at word initial, word medial word final (intervocalic) positions, geminates, pre-consonantal (—C) and post-consonantal positions (C—) respectively.

Sound	Word Initial	Word Medial	Word Final	Geminate	—C	C—
/p/	/pendərs/ 'lip'	/ʔussupuntam/ 'sixty'	-----	/lappun/ 'seven'	-----	/ʃampirəs/ 'rest'
/b/	/bitta/ 'sand'	/karabo/ 'drum'	-----	/babbo/ 'fear'	-----	/galba/ 'skin'
/p'/	/p'up'p'ule/ 'egg'	-----	-----	/p'up'p'ule/ 'egg'	-----	------
/t/	/tire/ 'liver'	/guta/ 'neighbor'	/s'et/ 'hundred'	/kutto/ 'chicken'	/suts/ 'blood'	/kajstrəs/ 'steal'
/d/	/dors/ 'sheep'	/ʔadus/ 'long'	-----	/ʔadde/ 'father'	/hedzitam/ 'thirty'	/ginde/ 'root'
/t'/	/t'ans/ 'breast'	-----	-----	-----	-----	/int'ərs/ 'tongue'
/ɗ/	-----	/maldɔ/ 'sweat'	-----	-----	------	-----
/k/	/kalta/ 'axe'	-----	-----	/zokko/ 'bridge'	/iske/ 'hair'	/ʃanka/ 'hunter'
/g/	/galba/ 'skin'	/gege/ 'tortoise'	-----	/wəggaz/ 'big'	-----	/penge/ 'gate'
/k'/	/k'ese/ 'elbow'	/mək'ets/ 'bone'	-----	-----	-----	/s'ink'o/ 'bad smell'
/ʔ/	/ʔacci/ 'teeth'	/naʔa/ 'child'	-----	-----	-----	-----

Table 2: Plosives and their distribution

As can be depicted from the above table, it is only /t/ that has distribution in all circumstances while the glottal stop /ʔ/ has a very limited distribution at word initial and intervocalic positions. /ʔ/, as stated above in the examples /ʔe/ 'yes' and /je/ 'yes (to say I am present)' bring meaning difference so that it is considered as a separate phoneme. Further, one can infer that all sounds except /t/ do not have word final consonant. This

implies that the absence of plosives and ejectives (except /t/) at word final position is notable.

Sound	Word Initial	Word Medial	Word Final	Geminate	—C	C—
/ɸ/	-----	/ʔaɸuns/ 'tear'	-----	-----	-----	/ʔajɸe/ 'eye'
/f/	----	/k'efo/ 'wing'	-----	-----	-----	-----
/s/	/suns/ 'name'	/kəsirəs/ 'vomit'	/t'ans/ 'breast'	/kasse/ 'yesterday'	/ospuntam/ 'eighty'	/suts/ 'blood'
/z/	/zərets/ 'seed'	/wəzana/ 'heart'	/wəggaz/ 'big'	-----	-----	/hedzitam/ 'thirty'
/s'/	/s'et/ 'thousand'	/kas'ojle/ 'big hoe'	-----	/wəs's'irəs/ 'run'	-----	/lahuns'e/ 'worm'
/ʃ/	/ʃucc/ 'stone'	/kaʃe/ 'hand'	/ʃoʃ/ 'snack'	-----	-----	-----
/h/	/hats/ 'water'	/mehe/ 'animal (domestic)'	-----	-----	-----	/ʃawho/ 'soft'

Table 3: Fricatives and their distribution

As can be seen from the table displayed above, /ɸ/ and /f/ mostly occur only at intervocalic position while /ɸ/ has a post-consonantal position. Besides, /ɸ/, /f/, /z/, /ʃ/ and /h/ do not have geminate from. Further, it is only /s/ that occurs in all positions. Again, all sounds do occur at intervocalic positions.

Sound	Word Initial	Word Medial	Word Final	Geminate	—C	C—
/c/	-----	/ʔecəre/ 'rat'	/buuc/ 'beard'	/ʔacci/ 'teeth'	-----	-----
/c'/	/c'ima/ 'old person'	/mac'ana/ 'daughter'	-----	-----	-----	-----

Table 4: Affricates and their distribution

As displayed above, /c/ occurs word medially whereas /c'/ does not. Furthermore, both /c/ and /c'/ occur at the intervocalic position. Apart from this, it is only /c/ which occurs at word final position and in its geminate form. Both /c/ and /c'/ then do not have pre-consonantal and post consonantal positions. Moreover, affricates do not occur in clusters.

Sound	Word Initial	Word Medial	Word Final	Geminate	—C	C—
/m/	/məla/ 'dry'	/kumət̪s/ 'full'	/ojditam/ 'forty'	/nammis'et/ 'two hundred'	-----	/ʃampirəs/ 'rest'
/n/	/naʔa/ 'child'	/duuna/ 'mouth'	/usuppun/ 'six'	/ʔajnno/ 'noon'	/zallanca/ 'trader'	-----

Table 5: Nasals and their distribution

As shown in the table above, both /m/ and /n/ appear at word initial, medial and final positions. All occur in their geminate forms. Regarding positions before and after consonants, /m/ has a post-consonantal position with no pre-consonantal position and it is vice versa for /n/.

Sound	Word Initial	Word Medial	Word Final	Geminate	—C	C—
/l/	/lage/ 'friend'	/bale/ 'feather'	-----	/zallanca/ 'trader'	/kalta/ 'axe'	-----
/r/	-----	/durirəs/ 'dance'	-----	/marr/ 'calf'	-----	/sugrəs/ 'push'
/w/	/wəgga/ 'Sunday'	'ʔawa' 'sun'	----	-----	-----	----
/j/	/jirəs/ 'come'	/gaje/ 'market'	-----	-----	/ʔajɸe/ 'eye'	-----

Table 6: Liquids and glides and their distribution

As can be seen from the above table, all liquids and glides except /r/ occur at word initial position. Besides, all of them occur at word medial position. On the contrary, all of them do not found at word final position. It is only /r/ which has a geminate word final occurrence while /l/ has intervocalic geminate form. In the pre-consonantal position, /l/ and /j/ do occur while /r/ and /w/ do not. Besides, it is only /r/ which has a post-consonantal occurrence. It is possible to infer that there is a pattern in the absence of liquids and glides word finally.

To sum up, all plosives except /t/ do not occur at word final position. Besides, majority of the plosives except /t/, /d/, and /k/ do not occur in cluster at pre consonantal position. The absence of affricates in clusters is also remarkable. Liquids and glides do not occur word finally. Further, they are rare in cluster formation.

2.1.4 Consonant Length (Gemination)

As Haile Eyesus (1981) identified, consonant length (gemination) is phonemic that it brings meaning difference. The following examples show the contrast between short and long consonants.

Examples:	/p/	/pp/	/gupe/	'stick'
			/guppe/	'jumping'
	/d/	/dd/	/gido/	'let it be'
			/giddo/	'middle'
	/l/	/ll/	/bola/	'body'
			/bolla/	'upon'

All consonant phonemes except /f/, /ɸ/, /t'/, /ɗ/, /z/, /ʃ/, /c'/, /k'/, /j/, /w/, /ʔ/ and /h/ occur as geminate. Consonants such as /c/, /k/ /s/ /d/ /g/ /b/ /t/ /ʃ/ /p/ /m/ /s'/ /l/ /n/ and /p'/ occur word medially while it is only /c/ that has word final geminate forms.

2.2 Vowel Phonemes

To classify the vowel phonemes of Dorze, terms like close, close-mid, open-mid and open are used for the height of the tongue position while front, central and back are employed to describe the horizontal position of the tongue.

The table below displays the vowel phonemes of Dorze identified from the data recorded from field work.

	Front	Central	Back
Close	i		u
Close-mid	e		o
Open-mid			
Open		a	

Table 7: Vowel phonemes of Dorze

2.2.1. Description of Vowel Phonemes

Here below the description of Dorze vowels is illustrated with examples.

1. /i/ close, front vowel (It appears in all positions within a word.)

Examples:	/iske/	'hair'
	/ista/	'they'
	/tire/	'liver'
	/mits/	'tree'
	/ʔacci/	'teeth'

2. /e/ close-mid, front vowel (No word begins with this vowel.)

Examples:	/k'ese/	'elbow'
	/s'et/	'thousand'
	/kets/	'house'
	/konke/	'forehead'
	/leʔe/	'thin'
	/ʔe/	'yes'

3. /a/ open, central vowel (It appears at word medial and final positions.)

Examples:	/waje/	'ear'
	/tanbo/	'tobacco'
	/naʔa/	'child'
	/ʔawa/	'sun'

4. /u/ close, back vowel (It appears in all positions within a word.)

Examples:	/umade/	'evening'
	/huɸe/	'head'
	/c'ucc/	'saliva'
	/suts/	'blood'
	/uduhuntam/	'ninety'

5. /o/ close-mid, back vowel (It appears in all positions within a word)

Examples:	/oʃinc/	'blow'
	/ola/	'war'
	/konke/	'forehead'
	/s'os/	'God'
	/sawo/	'smell'
	/s'ink'o/	'bad smell'

The two vowels /ɨ/ and /ə/ could possibly be allophones of /i/ and /e/ respectively because their distribution is so limited to different positions. Besides, they do not have minimal pairs. Instead, /ɨ/ serves in most cases to break impermissible cluster of consonants.

6. /ɨ/ close, central vowel (It appears only at word medial positions.)

Examples:	/hadrɨs/	'left'
	/ʔazɨna/	'husband'
	/t'ɨk'ɨmte/	'october'
	/gɨnbote/	'may'

7. /ə/ open-mid, central vowel (It appears only at word medial positions.)

Examples:	/pendərs/	'lip'
	/gəɸa/	'hunger'
	/gələʃo/	'monkey'
	/kəwo/	'dinner'
	/wənta/	'morning'

2.2.2 Contrast of Vowel Phonemes

The following list of pair of words is presented to show contrast of vowel phonemes of Dorze that could bring meaning difference.

1.	/c'ima/	'old person'
	/c'aama/	'shoe'
2.	/k'era/	'Saturday'
	/k'ara/	'red paper'
3.	/ʔoone/	'who'
	/ʔaane/	'where'

4. /kots/ 'beehive'
/kets/ 'nest' 'house'

5. /ʔukkirəs/ 'back'
/ʔekkirəs/ 'take'

6. /micco/ 'sister'
/macco/ 'wife'

7. /boosa/ 'grave'
/boso/ 'respecting'

There are also instances of near minimal pairs as shown below.

8. /gəɸa/ 'hunger'
/kəɸo/ 'bird'
/ʔaɸa/ 'up'

9. /hats/ 'water'
/mits/ 'tree'

2.2.3 Vowel Length

Short and long vowels are minimally contrastive. So, they are distinct phonemes in Dorze.

Examples:

/i/	/ii/	/sika/	'sew' imp. 2nd.mas
		/siika/	'slim'
		/mica/	'makes him laugh'
		/miica/	'hot'
/a/	/aa/	/gac'o/	'cheek'
		/gaac'o/	'grinding'
/e/	/ee/	/deʃa/	'non straight'
		/deeʃa/	'it is a goat'
/o/	/oo/	/toho/	'foot'
		/tooho/	'load'
		/bosa/	'respect them'
		/boosa/	'grave'

Chapter Three

The Nature of the Syllable, Syllable Related Constraints and Syllable Structure

3.1 The Nature of the Syllable

In this section, an attempt has been made to treat the nature of the syllable, phonotactics, and phonotactic constraints. Firstly, definitions of the syllable provided by different scholars are presented. Then, constituents of the syllable are treated with examples from Dorze. Following that, the phonotactics and syllabification of Dorze are presented. It is followed by the syllable types - open versus closed, light versus heavy and mono-syllabic versus di-syllabic. After that, the syllable structure is treated using the Moraic approach.

3.1.1 Defining the Syllable

The syllable is the most treated and well studied phonological concept. (Hyman 1975:188). Most phonologists have accepted the syllable and deal with it as a phonological unit. According to Blevins, cited in Michaelmas (2007), the syllable is defined as the phonological unit which organizes segmental melodies in terms of sonority. Roca and Johnson (1999:248) further define it from the view point of sonority in the following way: "Syllables are made up of a segment of high sonority flanked by segments of lower sonority. A syllable is therefore a cluster of sonority, defined by a sonorant peak acting as a structural magnet to the surrounding lower sonority element"

O'Grady and Dobrovolsky (1987:71), on the other hand, define a syllable in terms of its constituents as follows: "The syllable is made up of a syllabic nucleus, which is usually a vowel, and its associated non-syllabic segments". Similarly, Carr (2008:171) defines it as a unit of phonological organization whose central component is a nucleus, which is normally a vowel, and which may be preceded or followed by consonants. The above definitions have different areas of focus. For instance, the first two definitions emphasize on sonority - the loudness of a segment from a string of segments while definitions given by Carr and O'Grady and Dobrovolsky focus on constituents that form the syllable.

From the entire definitions given above one can infer that there is no single definition of the syllable agreed among scholars.

3.1.2 Constituents of the Syllable

A syllable basically contains two constituents: onset and rhyme (also known as rime). Rhyme branches into nucleus or peak and coda. The most notable, crucial and mandatory element is the nucleus while onset and coda are optional depending on the kind of syllable. Thus, a syllable must contain a vowel or a vowel-like sound. Yule (2006:47) states: "Technically, the basic elements of the syllable are the onset (one or more components) and the rhyme. The rhyme consists of a vowel, which is treated as the nucleus, plus any following consonant (s), described as the coda".

McMahon (2002:105), in the same token, states: "The only compulsory part of the syllable, and hence its head, or most important, defining unit, is the nucleus ... Both the onset and the coda are optional constituents, and each, if filled, will contain one or more consonants".

The following diagram shows the basic structure of a syllable.

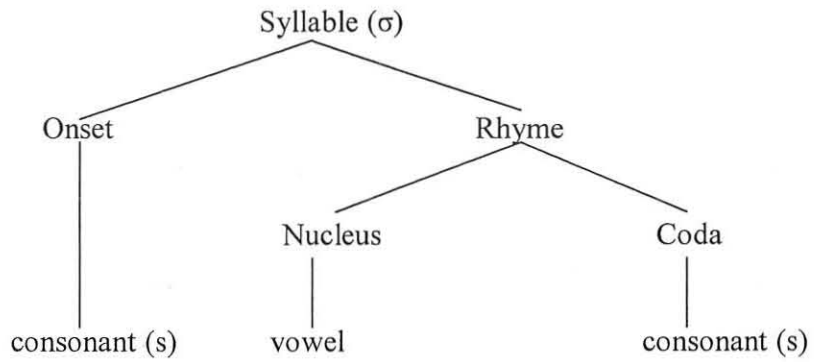
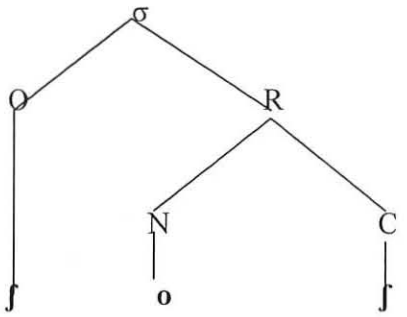


Diagram 1: The Universal Syllable Template (Adapted from Yule 2006:47 and McMahon (2002:105))

As displayed above, syllable is represented graphically by a means of tree diagram. Based on the above universal template of syllable structure, a mono syllable Dorze word /ʃoʃ/ 'snack' can be represented in diagram 2 below.



'snake'

Diagram 2: Syllable internal structure of the word [ʃoʃ]

The above template shows a mono syllable Dorze word having both the obligatory element – nucleus and optional elements —onset and coda.

3.2 Phonotactics and Syllabification

3.2.1 Phonotactics and Phonotactic Constraints

Phonotactics deals with the co- occurrence restrictions on the permissible combination between segments. In other words, it is all about restrictions on the permissible contents of onsets, peaks and codas.

In Dorze, any consonant that begin a word can be followed by any vowel and these vowels can be followed by any consonant.

Word initial cluster of consonants is not permissible in Dorze. That is to say, a word begins with only a single consonant. On the contrary, cluster of consonants is permitted at word medial and word final positions.

Consider the following two tables that show the well-formed and ill-formed medial and final cluster of Dorze core syllable representations in a columnar format. The rows specify the first members of such clusters and the columns specify the second members. A '+' indicates that the row/column pair is well formed cluster, while a '—' indicates that is not the case.

		n	d	j	r	l	w	s	t
A	p	+	—	—	—	—	—	+	—
	b	+	—	—	+	+	—	—	—
B	t	+	—	—	—	+	—	—	—
	d	+	—	—	—	—	—	—	—
	t'	+	—	—	—	—	—	—	—
C	k	+	—	+	—	—	—	+	—
	g	+	—	—	+	—	—	—	—
	k'	+	—	—	+	—	—	—	—
D	s	—	—	—	+	—	—	—	+
	z	—	+	+	—	—	—	—	—
	s'	+	—	—	—	—	—	—	—
E	f	—	—	—	—	—	—	—	—
	ɸ	—	—	+	—	—	—	—	—
F	c	+	—	—	—	—	—	—	—
G	l	+	—	+	—	—	—	—	—
	r	—	+	+	—	—	—	—	—
	h	—	—	—	—	—	+	—	—
H	ɗ	—	—	—	—	+	—	—	—

Table 8: Medial Consonant Clusters in Dorze

As can be seen in the above table, all consonant phonemes except /n/, /d/, /j/, /r/. /l/, /w/, /s/ and /t/ do not occur as a first member in cluster at word medial position whereas all consonant phonemes except /m/, /w/, /n/, /ʃ/, /c'/, /j/ and /ʔ/ occur as a second member. Besides, /n/ has a wider distribution with most consonants while the distribution of /w/ is only with /ʃawho/ 'soft'. Medial **ts** cluster is also rare in Dorze and it appears in words like /katsirəs/ 'cook (3sg. fem)'.

		j	w	l	r	p	t	k	m	n	f
A	p	—	—	—	—	—	—	—	—	—	—
	b	—	—	—	—	—	—	—	—	—	—
B.	t	—	—	—	—	—	—	—	—	—	—
	d	+	—	—	—	—	—	—	—	—	—
C	k	—	—	—	—	—	—	—	—	—	—
	g	—	—	—	—	—	—	—	—	—	—
D	s	+	—	—	+	—	+	—	—	+	—
	ʃ	—	—	—	—	—	—	—	—	—	—
	c	—	—	—	—	—	—	—	—	+	—

Table 9: Final Consonant Clusters in Dorze

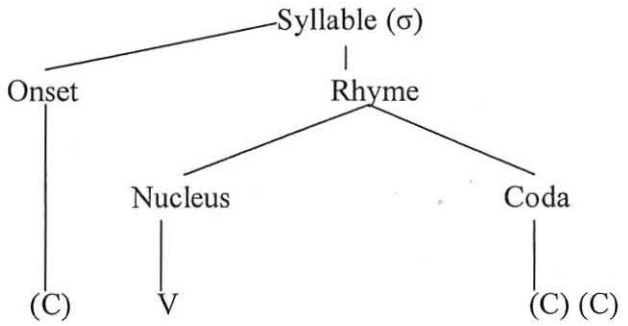
As shown in the above table, /j/, /r/, and /t/ come as the first constituent at syllable final position with /s/ only where as /n/ comes with /s/ and /c/. The following are examples: /ʔojd/ 'four', /ʔajs/ 'why', /in.tˈərs/ 'tongue', /hats/ 'water', /suns/ 'name' and /oʃinc/ 'blow'. Out of the 26 consonant phonemes identified, all except /j/, /r/, /t/ and /n/ do not occur as the first member of the cluster while only /d/, /s/ and /c/ occur as second member of the cluster. Furthermore, it is also possible to predict that syllable final clusters in Dorze consist of no more than two consonants.

According to Hyman (1975:188), whenever languages have syllable types other than CV – the commonest syllable in world's languages, complications arise in the exact determination of syllable boundaries. For instance, should a word with the structure CVCCV be syllabified as CV.CCV or as CVC.CV? He further states that there is an intimate relationship between word structure and syllable structure. Thus, ideally, the same sequential constraints which operate at the beginning of a word should be operative at the beginning of a syllable, even if this syllable is word-internal. Similarly, the same sequential constraints which operate at the end of a word should be operative at the end of a syllable.

Now, let's see language specific syllable structure constraints that are found in Dorze. In all syllables in Dorze, only one consonantal element occurs as an onset. That is to say, word initial cluster of consonants is impermissible in Dorze. This does not mean onset is always obligatory; rather a vowel can alone form a syllable.

The maximum number of consonant sequence at syllable final position is two. (See table 9 above)

Based on the restrictions on onset (onset constraints) and coda constraints discussed above, here is the syllable template for Dorze.



There are phonotactic constraints or restrictions on the sequence of sounds that occur in a given position in a syllable. They, according to Carr (2008:130), vary from language to language.

Pulgram (1970) cited in Hyman (1975:189) proposes the following universal principles for determining syllable structure. These include:

1. ***a principle of maximal open syllabicity*** — a syllable boundary is inserted after every vowel (or diphthong) of a word. Thus, Dorze words like /pendərs/ 'lip' and /galba/ 'skin' are syllabified as pe.ndərs and ga.lba so as to make the first syllable open.

2. ***a principle of minimal coda and maximal onset*** – it is a principle in which if the syllable cannot be kept open because the consonant or consonants that would form the onset of the next syllable do not occur in word-initial position, then as many as consonants as necessary —but no more — to reduce the onset to a permissible word-initial shape must be detached from it and transferred to the preceding syllable as coda, thus closing the syllable.

Similarly, McMahon (2002:111) calls it Onset Maximalism or Initial Maximalism where there is a choice, always assign as many consonants as possible to the onset, and as few as possible to the coda.

This principle is well explained with facts from Dorze because, as discussed above that there is a link between word and syllable structure, Dorze does not allow cluster of consonants at syllable initial position. Therefore, while /pendərs/ and /galba/ are syllabified as pe.ndərs and ga.lba by the principle of maximal open syllabicity, this would create a syllable initial **nd** and **lb** sequences respectively, which cannot occur word initially. Thus, the n and l must be sent back to the first syllable to yield pen.dərs and gal.ba, where each syllables CVC, CVCC, CVC and CV syllables meet the syllable structure constraints of Dorze.

3. ***a principle of irregular coda*** — if the necessary transfer from syllable-initial to syllable final position leads to an inadmissible syllable-final group of consonants, then the burden of irregularity must be borne by the coda rather than the following onset.

In addition to Pulgram's proposal, Hall (2006:330) suggested that there is also an important principle regarding phonotactics which bases itself on the notion of sonority. Sonority of a segment is defined roughly as its loudness relative to other sounds produced with the same length, stress and pitch. An example of sonority hierarchy cited in Hall from Clements (1990) shows:

Sonority hierarchy ('>' = 'more sonorous than')

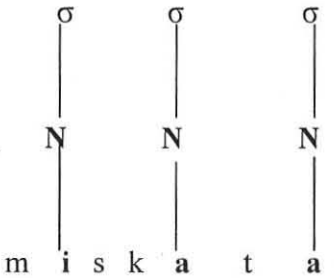
Vowels > glides > liquids > nasals > obstruents

Hall further elaborates that many linguists argue that the segment occupying the nucleus is the most sonorous element in the syllable whereas the onset tends to increase the sonority inwards toward the nucleus, and the coda tends to decrease in sonority away from the nucleus. It is often assumed that the sonority hierarchy is universal, but many researchers have proposed language- specific hierarchies. The question of what segment types are presented in the sonority hierarchy is clearly related to how the term sonority is defined.

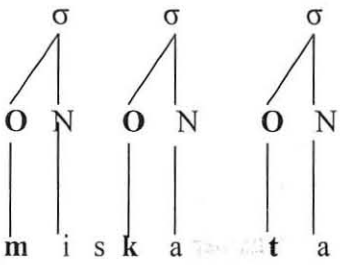
3.2.2 Syllabification

Carr (2008:171) defines syllabification as the process whereby segments are slotted into syllabic positions. Now, let's see syllabification using the universal syllabification procedure adapted from O'Grady and Dobrovolsky (1987:71) to set up syllables. Each language has its own syllable structure that matches with language specific facts. Note that the examples used to show how to syllabify words are Dorze words.

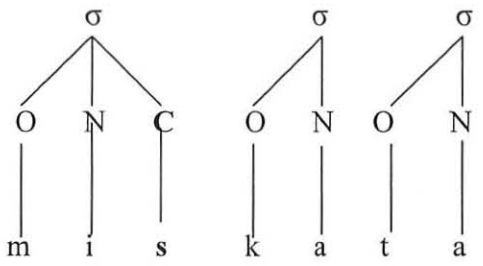
Step a) Each syllable segment (usually a vowel) makes up a syllabic nucleus. To represent this, link a vowel to an N above it by drawing an association line, and then to a σ symbol above the N by drawing another association line.



Step b) The longest sequences of consonants to the left of each nucleus that does not violate the phonotactic constraints of the language in question is called the onset of the syllable. Link these consonants to an O and join it to the same syllable as the vowel to the right.



Step c) Any remaining consonants to the right of each nucleus are called the coda and are linked to a C above them. This C is associated with the syllable nucleus to the left.



/miskata/ 'buttock'

Diagram 5 : Syllabification in Dorze

3.3 Types of the Syllable

The syllable can be classified into different categories. Closed and open syllable types are found in terms of either having a terminal element coda or not. Further, syllables can be grouped into heavy and light depending of their weight. There is also a distinction between mono syllable type where a word has a single syllable; di- syllable where a word has two syllable or multi-syllable where a word is made up of more than two syllables.

Whether or not a syllable is heavy or light, mono or di-syllabic, it is the CV type syllable which is the most basic type of syllable that exists in all languages and first appears in child language acquisition. Scholars support this view in different ways. Let's consider the ideas of some prominent scholars as follows.

Yule (2006:47) remarks : "the most common type of syllable in a language also has a consonant (C) before the vowel (V) and is typically represented as CV". Michaelmas (2007) also states: "The most basic or core syllable type is CV, found in every language and first emerges in language acquisition". Malmberg, cited in Hyman (1975:188), further states that the CV type of syllable is even the most archaic and the aged of all syllable types. He says "A syllable consisting of a consonant plus a vowel represents the most primitive, and without doubt historically the oldest, of all syllable types, the only one which is general in all languages". Scholars like Carr (2008:171) and Roca and Johnson (1999:240) also share the idea of the aforementioned scholars.

3.3.1 'Open' versus 'Closed' Syllables

Basically, the initial consonant of a syllable (onset) is not relevant in determining the phonological property of a syllable – open versus closed and heavy versus light distinctions. In fact, there are two further sub divisions of the syllable type based on the structure of the rhyme: syllables may be open or closed. Syllables that have no terminal element coda are termed as open syllables where as syllables with a terminal element (s) are considered to be closed. Hyman (1975:189), Carr (2008:171) and Hall (2006:113) discuss that an open syllable ends in a vowel, while a closed syllable is "checked" or "arrested" by a consonant. Hall specifically states that it does not matter, for those calculations, whether the nucleus and coda are simple, containing a single element, or branching, containing more than one: a branching nucleus would have a long vowel or diphthong, while a branching coda would contain a consonant cluster. A CV syllable thus has a core with a zero coda, while a CVC syllable has a core with a V peak and a C coda. Let's us illustrate the aforementioned discussion with examples from the language under study – Dorze.

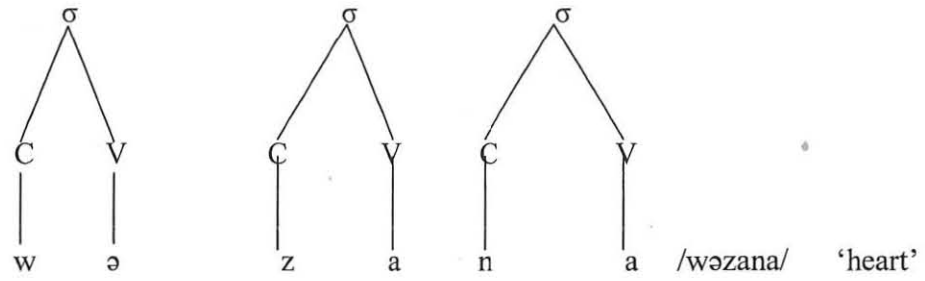
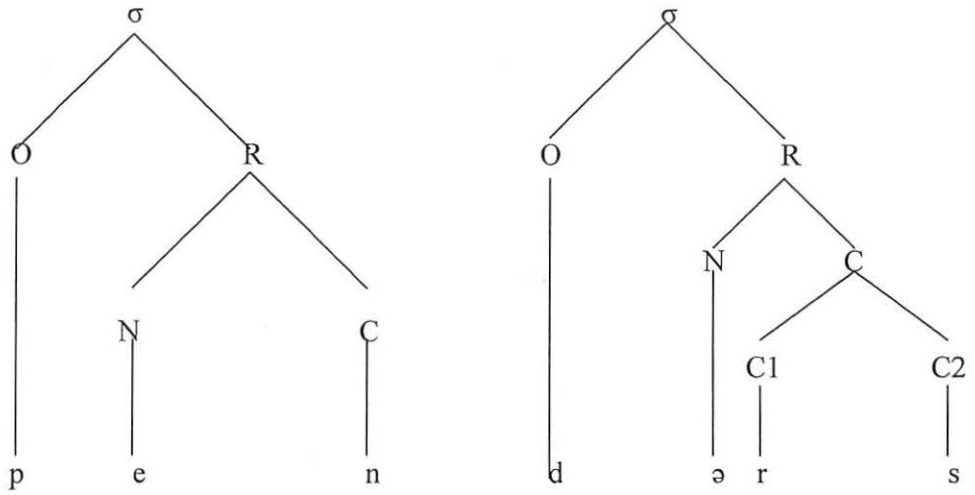


Diagram 3: Syllable internal structure of open syllables

As can be seen above, the word has three CV syllable types. This shows that all the syllables end with a vowel. Therefore, all are open syllables. On the contrary, the word in diagram 4 below has two syllables – CVC and CVCC. This displays that both the syllables end with a terminal coda or codas.



/pendərs/ 'lip'

Diagram 4: Syllable internal structure of closed syllables

3.3.2 'Heavy' versus 'Light' Syllable

The other kind of distinction is between heavy and light syllables. Many languages distinguish between 'heavy' and 'light' syllable for the purpose of stress pattern, tone patterns, or metrical traditions. As stated in section 3.1.3.1, syllable weight distinction involves only the syllable rhyme and ignores the syllable onset – onsets are entirely irrelevant in the calculation of syllable weight. According to Hall (2006:336), the most common divisions for stress are those in which VV is heavy and V is light, or where VV and CV are heavy as V is light. Hall (2006:114) remarks the distinction between heavy and light syllable as follows:

> A light syllable contains only a short vowel in the rhyme with no coda... If a syllable has a complex rhyme, then it is heavy; and complexity can be achieved in two different ways. First, a heavy syllable may have a short vowel, but one or more coda consonants... Second, it may have a branching nucleus, consisting of a long vowel or diphthong; such a syllable will be heavy whether it also has a filled coda.

3.3.3 Monosyllable, Disyllable and Multisyllable words

The last distinction between types of the syllables is among monosyllable, disyllable and multisyllable words. Monosyllable words are words that contain a single syllable; a disyllable is a word having two syllables whereas if a word contains more than two syllables, it is considered to be a multisyllable word.

3.3.3.1 Monosyllables

There are five kinds of allowable monosyllable shapes in Dorze. These include CV as open syllable and closed syllables of four shapes: CVC, CVVC, CVCC and CVVCC where CC is either a cluster of heterogeneous consonants or a geminate and VV is vowel length.

Examples:

CV	ʔe	'yes'
CVC	s'et	'hundred'
	s'os	'God'
	ʃoʃ	'snake'
CVVC	buuc	'beard'
	taam	'ten'
	deeʃ	'goat'
CVCC	t'ans	'breast'
	suts	'blood'
	ʔojd	'four'
	gars	'down'
	ʔajs	'why'
	c'ucc	'saliva'
	ʃucc	'stone'
CVVCC	maats	'milk'
	s'uuns	'fingernail'

3.3.3.2 Disyllable Words

There are about eleven kinds of underived disyllabic shapes that are exemplified below. CC at word final position could be cluster or geminate.

Examples:

V. ^{2}CV	o.la	'war'
	i.za	'he'
VC.CV	is.ke	'hair'
VC.CVCC	in.t'ərs	'tongue'
CV.CV	ga.c'o	'chin'
	k'e.se	'elbow'
CV.CVC	ʔa.war	'what'
CV.CVCC	mə.k'ets	'bone'
	kə. rits	'black'
CVC.CV	kon.ke	'forehead'
	gal.ba	'skin'
CVC.CVC	had.rɨs	'left'
CVC.CVCC	pen.dərs	'lip'
CV.CVV	mo.lee	'fish'
CVV.CV	duu.na	'mouth'
	k'oo.ɗe	'neck'

[2] Remark: The dot (.) between words is used to show syllable boundary.

3.3.3.3 Multisyllable Words

There are also both underived and derived multisyllabic words in Dorze.

	Underived Multisyllabic words		Derived Multisyllabic words	
CV.CV.CV	ka.ra.bo	'drum'	-------	
	wə.za.na	'heart'	-------	
CV.CV.CVC	na.mi.tam	'twenty'	mi.c'i.rəs	'laughs (mas)'
			mi.c'a.rus	'laughs (fem)'
CV.CVC.CVC	-------		pi.rad.rəs	'fly'
CVC.CV.CVC	-------		jək.ki.rəs	'weeps (mas)'
	-------		jək.ka.rus	'weeps (fem)'
	-------		k'an.s'i.rəs	'cuts (mas)'
	-------		kan.s'a.rus	'cuts (fem)'
CVV.CV.CV	ʔaa.cə.re	'spider'	-------	
CV.CVC.CV	ka.s'oj.le	'big hoe'	-------	
CVC.CV.CV	mis.ka.ta	'buttock'	-------	
	gul.ba.ta	'knee'	-------	
	c'un.c'a.le	'ant'	-------	
CVC.CVC.CVC	-------		sak.kit.rəs	'sick (mas)'
V.CVC.CVC	u.sup.pun	'six'	-------	
V.CVC.CVCC	i.lin.t'ərs	'guts'	-------	
VC.CV.CVC	--------		in.gi.rəs	'gives (mas)'
CV.CVC.CV.CVC	-------		tə.mar.si.rəs	'teaches (mas)'
CVC.CV.CV.CVC	-------		ʃan.ka.ti.rəs	'hunts (mas)'

As displayed above, most of the words have the CV syllable type which is common to all languages.

In Dorze, there are EIGHT types of syllable identified as part of the phonological system of the language.

The following table presents a summary of the syllable types that are basic and common in Dorze.

Syllable Type	Examples	Gloss	Remarks
V	o. la i.za	'war' 'he'	The first syllables **o** and **i** respectively are vowels.
CV	ho.ʔo sa.ʔa	'hot' 'earth'	Each syllable has a CV shape.
CVC	koʃ ʔuʃ	'shadow' 'heifer'	
CVVC	deeʃ ʔiiʃ	'goat' 'brother'	
CVCC	məts ʃucc	'honeybee' 'stone'	
CVVCC	maats s'uuns	'milk' 'fingernail'	
VC	is.ke in.t'ərs	'hair' 'tongue'	The first syllable of the second word /int'ərs/ is a VC syllable.
CVV	duu.na gaa.wo	'mouth' 'belly'	The first syllable of each word is a CVC syllable.

Table 10: Basic Syllable Shapes in Dorze

3.4 Dorze Syllable Structure

3.4.1 Data and Analysis

According to Clements and Keyser (1983:29), languages of the world can have one of the canonical inventories of primary core syllable types. These incorporate:

Type I: CV

Type II: CV, V

Type III: CV, CVC

Type IV: CV, V, CVC, VC

As discussed under section 3.1.3, the most basic syllable type that belongs to all languages of the world is the CV type. This kind of syllable is the one children first acquire at infancy when they start to speak.

Subsequently, the CV syllable type may be then applied on to yield one or more of the other core syllable types by the following two operations:

Rule a: delete syllable initial C

Rule b: insert syllable final C

This implies that type I languages do not operate any of the above two rules. In other words, there is neither insertion nor deletion of C. Type II involves rule (a) in a way that a vowel can alone constitute a syllable; type III involves rule (a) that a CV syllable can be CVC with an insertion of a terminal coda where as the last type involves both rule (a) and (b).

Dorze, then, based on the facts of the language elaborated under section 3.1.3.3.1 – 3.1.3.3.3, is identified to be one of the type IV languages. This implies that a vowel alone can serve to formulate a syllable.

3.4.2 A Moraic Analysis

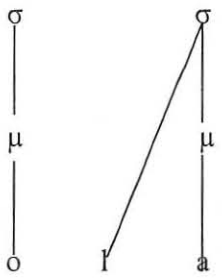
Under Moraic account, facts of Dorze can be discussed and illustrated as follows. The theory has a number of claims. The only mediating element between the syllable node and the segmental root node is mora. In addition, the syllable contains neither an onset nor a coda. Vowels are always underlyingly Moraic. Short vowels are associated with one mora (i.e. they are monomoraic) while long vowels have two moras. Short consonants are moraless while long consonants and geminates have one mora because they carry syllable weight. Further, glides and segments in syllable onsets are moraless. Now, let's see the aforementioned theoretical issues with examples from Dorze.

1. **μ (Each syllable has a monomoraic shape)**

Examples:	a.	/o.la/	'war'
	b.	/is.ke/	'hair'
	b.	/wa.je/	'ear'

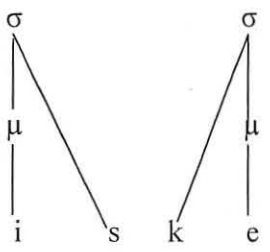
Let's see the diagrammatic representations of each example.

a.



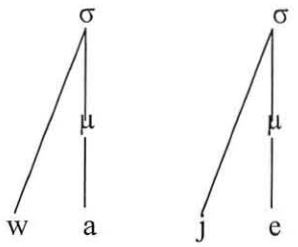
/ola/ 'war'

b.



/iske/ 'hair'

c.



/waje/ 'ear'

As can be seen from the above diagrams, in (a), a vowel /o/ alone constitutes a heavy syllable because vowels are always underlyingly Moraic while the second syllable in examples (a) and (b), and both syllables in (c) are all monomoraic syllables where all are CV shapes. Ehala (2003) generalizes that a CV syllable with a short vowel is always light. (See section 1.8.3.2). Counter to Ehala, in this study, I use the way Hayes (1989) and Cohn (2003) argue that vowels normally bear a mora underlyingly while consonants do not. It is this point what makes Hayes and Cohn different from Ehala's idea.

Further, it is possible to infer that a VC syllable is again a monomoraic where the short vowel /i/ is directly associated with one mora.

2. μμ (Long vowels have two moras)

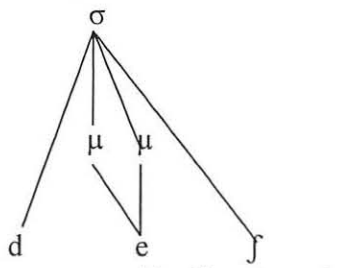
Mora is important to express segmental length distinction. According to Ehala (2003), one of the conventions to achieve such a length distinction is to assign them two moras.

Examples: b. /deeʃ/ 'goat'

c. /duuna/ 'mouth'

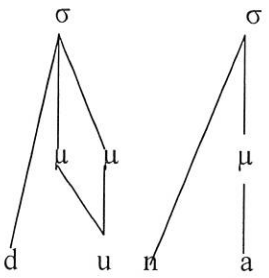
Now, let's see how to represent them using the Moraic approach in a diagram.

a.



/deeʃ/ 'goat'

b.



/duuna/ 'mouth'

From the above diagrams, it is possible to deduce that the long vowels /e/ in example (a) and /u/ in example (b) have two moras, that is to say, they are bimoraic so that they directly branch from the syllable node and have a single vowel to represent them.

3. μ (Long consonants and geminates have one mora)

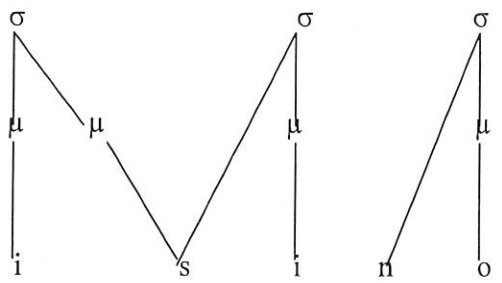
Cohn (2003) suggests that the way we represent geminates is different from the way we represent vowel length. According to Ehala (2003), long consonants and geminates have one mora while two moras are assigned in the case of vowel length. He further claims that moraicity is the natural property of geminate consonants. In other words, if there is cluster of consonants and geminate word medially, the first consonant takes mora whereas the second branches from the syllable node of the next syllable.

Examples:

a.	/issino/	'one'
b.	/lappun/	'seven'
c.	/kutto/	'chicken'

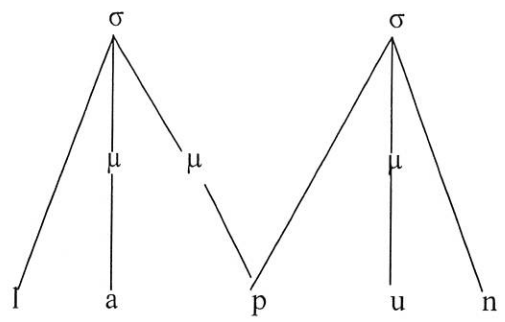
Let's see the Moraic representation of each word.

a.



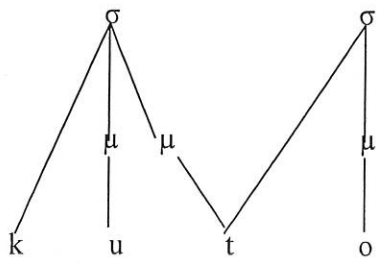
/issino/ 'one'

b.



/lappun/ 'seven'

c.



/kutto/ 'chicken'

As can be seen from the above diagrams, in all cases, the geminate takes mora. The mora role is assigned by using the WbP rule which states that a CVC syllable which is underlyingly light becomes heavy by its position. In words when there is consonant cluster at word medial position or geminates, the coda of the first syllable takes mora in heterogeneous cluster. Similarly, geminate (cluster of homogenous consonants) also serves as a weight bearing unit for the first syllable. Furthermore, the onset of each syllable branches from the syllable node.

Furthermore, any cluster of heterogeneous consonants at word final position takes no mora. Rather, the consonants branch from the syllable node.

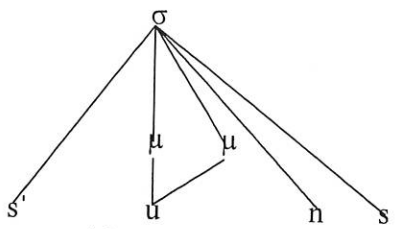
Examples:

a. /s'uuns/ 'fingernail'

b. /pendərs/ 'lip'

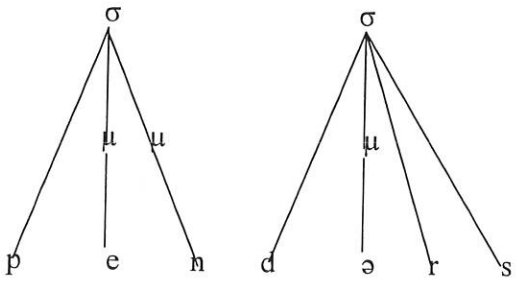
How does the Moraic phonology account cluster of consonants? It gives no mora role for consonant clusters at word final position. Instead, they branch from the syllable node like a geminate branching from the syllable node to serve as an onset of the next syllable. If the cluster is word medial, depending on the phonotactics of the language, the coda consonant of the first syllable takes mora by position. Let's see the representation in a diagram.

a.



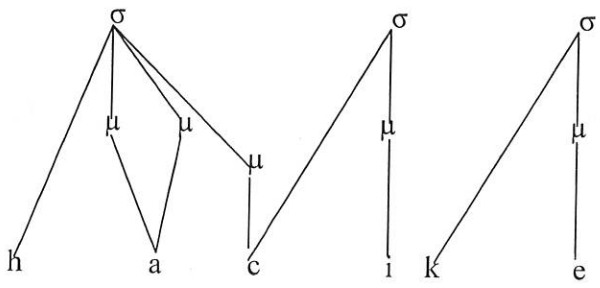
/s'uuns/ 'fingernail'

b.



/pendərs/ 'lip'

There is also a case where a vowel length and geminate come in sequence in Dorze — /haaccike/ 'shoulder'. This can be easily drawn in a diagram using the Moraic account as follows:



/haaccike/ 'shoulder'

As can be seen in the above diagram, a long vowel and a geminate consonant occur within a word one after the other. In such cases, the long vowel /a/ has two moras whereas the second syllable /-cci/ is heavy in which it bears mora and also serve as an onset of the next syllable because geminates have one mora. This kind of syllable where a long vowel is followed by either a geminate or cluster is considered to be a super heavy syllable, constituting trimoraic syllable (Cohn 2003:80). Many scholars like Hyman (1975), Carr (2008) and Hall (2006) argue that the syllable rhyme and onsets are totally irrelevant in the calculation of syllable weight. Therefore, one can infer that onsets are not considered to assign mora.

Chapter Four

Syllable Based Morphophonemic Processes in Dorze

As elaborated in the theoretical framework section of the thesis, syllable serves as a domain because there are a number of phonological processes which take the syllable as their domain of application. Besides, syllables can serve as targets of language games or as prosodic targets in morphological processes like reduplication.

In this chapter, then, the foremost syllable based morphophonemic processes that undergo in Dorze are presented. These include consonant assimilation, deletion, insertion, affixation and reduplication.

4.1. Assimilation of Consonants

O'Grady and Dobrovolsky (1987:42) defines assimilation as a common phonological process that always results from a sound becoming more like another nearby sound in terms of one or more of its phonetic characteristics. There are different parameters used to classify the type of assimilation. Derib (2006:79) mentions four criteria. These include: (a) ***the degree of assimilation*** where assimilation can be seen from two perspectives: total assimilation — an assimilation in which a nearby sound shares almost all the features of the influencing sound whereas partial assimilation is a case in which an influenced sound takes partial features of an influencing sound, (b) ***the shared feature*** which is all about features shared whether it is place of articulation, manner of articulation or voicing condition, (c) ***the direction of assimilation*** where it can be seen as progressive assimilation — an assimilation where the feature moves forward; that is to say, a feature moves from left to right while regressive assimilation is a kind of assimilation in which a feature is shared moving backwards to a preceding sound; that is to say, there is right to left assimilation, and (d) ***the proximity of the sounds that are involved in assimilation*** — contiguous assimilation is a case in which there are no intervening sound between the sound that undergoes the change and the sound that caused the change in opposition to non contiguous in which there are intervening sounds between the sounds that are influenced.

Let's illustrate the above discussion with examples from Dorze as follows:

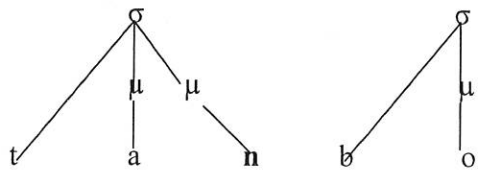
Examples:

a..	/tanbo/	⟶	[tambo]	'tobacco'
b.	/ʃənpirəs/	⟶	[ʃəmpirəs]	'rests (3rd mas sg)'
c.	/ingirəs/	⟶	[iŋgirəs]	'gives (3rd mas sg)'
d.	/penge/	⟶	[peŋge]	'door' 'gate of a compound'
e.	/ʃanka/	⟶	[ʃaŋka]	'hunter'
f.	/oʃinc/	⟶	[oʃiɲc]	'blow'

As can be seen from the above data, in all cases there is total assimilation where the nasal /n/ assimilates the preceding sounds /b/, /p/, /g/, /k/ and /c/. The direction is regressive; the proximity is contiguous where there is no intervening sound between the influencing sound that affects and the influenced sound which is affected. Furthermore, the shared feature is that of place of articulation in which a nasal sound /n/ in examples (a) and (b) becomes a bilabial one /m/, in examples (c), (d) and (e), it becomes a nasal velar /ŋ/ due to the influence of the plosive velar voiced /g/ and /k/, and in example (f), it becomes a plosive palatal /ɲ/ due to the influence of /c/ which is plosive palatal.

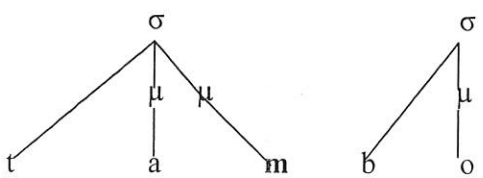
One of the merits of the syllable as a phonological unit is that it accounts as a domain of application for different phonological processes. In all examples stated above, the assimilatory process happens at syllable boundary.

Let's see how we represent the syllable structure using Moraic approach.



Underlying Representation

/tanbo/ 'tobacco'



Resyllabification

In addition, there is also another case of assimilation called labialization or rounding. According to Katamba cited in Mulugeta (2001:103), labialization may be defined as a process by which anticipating a rounded vowel the speaker start up rounding the lips before the articulation of the preceding is completed.

Examples:

/wəɗoro/	⟶	[woɗoro]	'rope'
/wəggaz/	⟶	[woggaz]	'big'
/wərk'a/	⟶	[work'a]	'gold'
/wənta/	⟶	[wonta]	'morning'
/wəʔe/	⟶	[woʔe]	'how'
/wəzana/	⟶	[wozana]	'heart'
/wəsa/	⟶	[wosa]	'to beg'
/wəts/	⟶	[wots]	'to run'
/wəɗo/	⟶	[woɗo]	'to kill'

As shown above, in all the examples, when the bilabial glide /w/ appears word initially, it then has a progressive effect on the vowel next to it. Therefore, the central unrounded vowel /ə/ changes to the back rounded one /o/ because of the rounding feature that spreads from the preceding consonant /w/. Here also the labialization does not affect the syllable structure.

4.2 Deletion

Deletion is a phonological process where there is an omission of a sound segment. O'Grady and Dobrovolsky (1987:44) define it as a process that removes a segment from a certain phonetic context. They further explain that it occurs in everyday rapid speech in many languages. It also occurs as an alternation to dissimilate in a word such as fifths. Many speakers delete the [θ] of the final consonant cluster and say [fifs]. In very rapid speech, both [f] and [θ] are sometimes deleted, resulting in [fis].

In Dorze, deletion occurs in two ways.

1. It can be deletion of a vowel. It is a strategy by which the system avoids impermissible sequences at a morpheme boundary so that the final output (the derived word) confirms to the syllable structure constraints of the language. This can be considered as an alternation.
2. It can be deletion of a consonant.

Cardinal numbers that end with vowels always drop the final vowel while forming numbers more that ten by multiplication. The following data can easily show how this works.

Paradigm A:

/namʔa/	'two'
/hedza/	'three'
/ʔojd/	'four'
/ʔicəcc/	'five'
/usuppun/	'six'
/lappun/	'seven'
/ospun/	'eight'
/oɗuɸun/	'nine'
/taam/	'ten'

Paradigm B:

/namitam/	'twenty'
/hedzitam/	'thirty'
/ʔojditam/	'fourty'
/iccəctam/	'fifty'
/usuppuntam/	'sixty'
/lappuntam/	'seventy'
/ospuntam/	'eighty'
/uɗuɸuntam/	'ninety'

Paradigm C:

/s'et/	'hundred'
/namis'et/	'two hundred'
/iccɔcs'et/	'five hundred'
/ʃije/	'thousand'

The above three paradigms show cardinal numbers of Dorze that represent amount in most cases.

Let's consider examples that show as how the syllable serves as a domain of application for deletion so that the outcome of each matches with the phonotactics of Dorze.

Example (a) : nam?a + taam

namØ + taØm - syllable reduction

namitam 'twenty' – insertion

Example (b) : hedza + taam

hedzØ + taØm

hedzitam 'thirty'

As can be seen in example (a) and (b) above, there is a syllable reduction and vowel deletion so as to insert an epenthetic vowel. As discussed in section 3.2.1, the phonotactics system of Dorze does not permit **mt** and **zt** clusters. Therefore, insertion of a vowel /i/ comes as a strategy to avoid the impermissible sequence.

Now, let's illustrate some ordinal numbers that show order rather than amount or position of something.

Paradigm D:

/issinso/	'(be) first'
/nam?anso/	'(be) second'
/hedzanso/	'(be) third'

In Dorze, **ns** cluster is impermissible both at word initial and medial positions, but in the case of ordinal marker when it comes at morpheme boundary, the pattern confirms the co occurrence restrictions among individual segments in Dorze. At the same time, the syllable structure is affected.

Now, let's look how forming ordinal numbers and other related issues affect the syllable structure.

a. /nam?a/ 'two'

b. /taam/ 'ten'

c. /namitam/ 'twenty'

When forming twenty multiplying two by ten, the output twenty comes in a different shape. There are basic phonological processes that undergo. These include deletion and insertion of segments. The word in (a) drops the glottal /?/ and there is an alteration of the final /a/ to /i/. Besides, the word in (b) lacks its lengthening due to the front high vowel /i/. This can also be seen in the following example:

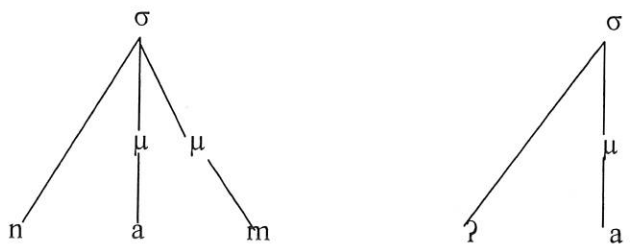
a. /hedza/ 'three'

b. /taam/ 'ten'

c. /hedzitam/ 'thirty'

As can be seen above in paradigm (b), other words that end with consonant attach **taam** where there is vowel shortening. See the syllable structures below.

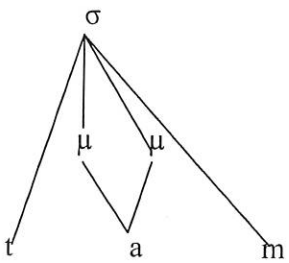
1.



Syllabification

/nam?a/ 'two'

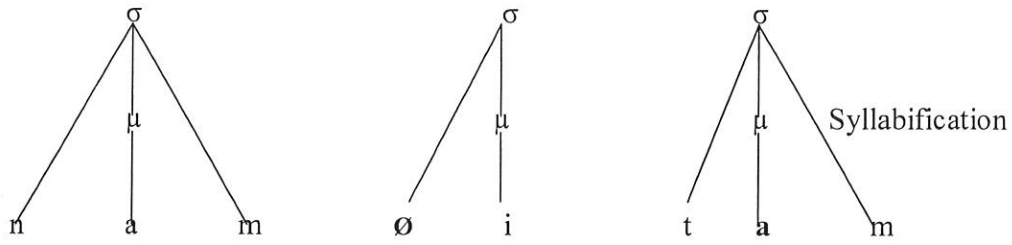
2.



Syllabification

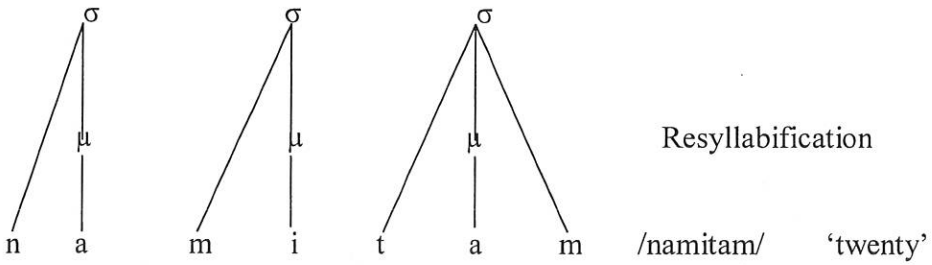
/taam/ 'ten'

3.



/namitam/ 'twenty'

The deletion of the glottal /ʔ/ sound leads the coda of the first syllable /m/ to take an onset position of the second syllable. Besides, the shortening of /a/ makes the bimoraic syllable a monomoraic one. Therefore, the CVC.CV and CVVC word comes out as a CV.CV.CVC one. The resyllabification is displayed below.



4.3 Insertion

Insertion or epenthesis is a process of inserting a vowel or a consonant to break impermissible string of sounds. O'Grady and Dobrovolsky (1987:44) define it as a process that inserts a vowel or a consonant segment within an existing string of segments. Dorze, as explained in chapter three, allows a maximum of two consonant segments at syllable final position. In cases where there is a cluster of more than two sounds, inserting the central high vowel /ɨ/ is used to break up such impermissible cluster.

Examples:

/dors/	'sheep'
/in.t'ərs/	'tongue'
/gi.li.gərs/	'armpit'

In the data given above, the monosyllabic word /dors/, the disyllabic /in.t'ərs/ and the trisyllabic /gi.li.gərs/ have syllables that end in **rs** cluster which is permissible in the language. On the other hand, if there is a syllable like /hadrs/ 'left' where there is cluster

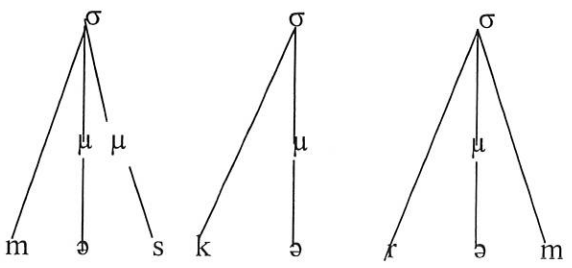
of **drs** where neither **dr** nor **rs** is not a permissible co occurrence, inserting /ɨ/ is used to break up the impermissible cluster. This process is therefore takes place in order to conform to the syllable structure constraints of Dorze. In other words, the CVCCC syllable results in to heavy and light syllables respectively.

Now, let's also see how the syllable structure of Amharic origin words is affected while they become Dorze ones.

	Amharic	Dorze	
Paradigm A:			
	/cʼamma/	/cʼaama/	'shoes'
	/surri/	/suuri/	'trousers'
	/ʔazzo/	/ʔaazo/	'crocodile'
Paradigm B:			
	/ʃinkurt/	/ʃinkurto/	'onion'
	/birr/	/bira/	'money'
Paradigm C:			
	/gulbət/	/gulbəta/	'knee'
	/wərkʼ/	/wərkʼa/	'gold'
Paradigm D:			
	/timatim/	/timatime/	'tomato'
	/məskərəm/	/məskərəme/	'September'
	/tʼikʼimt/	/tʼikʼimte/	'October'
	/hidar/	/hidare/	'November'
	/tahisas/	/tasase/	'December'
	/tʼirr/	/tʼire/	'January'
	/nəhase/	/nase/	'August'
	/dakkijje/	/dakkijo/	'duck'
	/dinnicc/	/dinnicco/	'potato'
	/ʃi/	/ʃije/	'thousand'

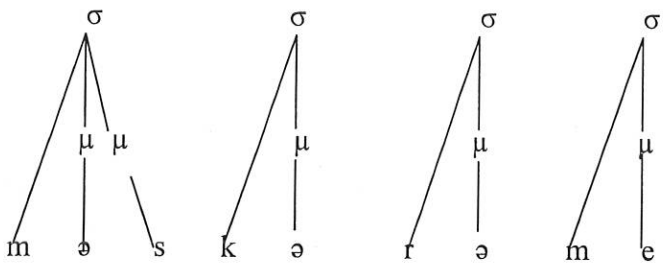
As can be seen from the data above, paradigm A shows that when a word with geminate consonant is borrowed from Amharic, the geminate consonant is degeminated and the vowel following it becomes lengthened so as to compensate the deletion of the consonant segment. Besides, all words that are borrowed from Amharic attach a vowel at the end because nouns in Dorze except words ending with cluster and geminate end with vowel. Moreover, the coda constraint of Dorze does not allow word final **-rt**, **-rk'** and **-mt** clusters. Therefore, the Amharic words /ʃinkurt/, / wərk'/ and /tɨk'ɨmt/ become /ʃinkurto/, /wərk'a/, and /tɨk'ɨmte/ respectively and conform the phonotactic pattern of Dorze. Similarly, the syllable structure is affected. See the diagrammatical representation below.

a.



/məskərəm/ 'September'

b.



/məskərəme/ 'September'

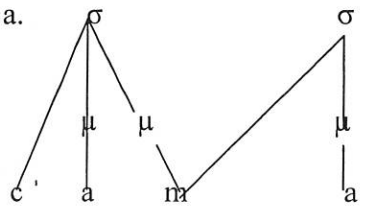
As can be seen from the above diagrams, in (a), the Amharic word /məskərəm/ has a CVC.CV.CVC where as when it is borrowed and get fixed to the structure of Dorze, it becomes a CVC.CV.CV.CV where the coda of the Amharic word turns to an onset position of the final syllable and the word inserts a vowel.

Let's also consider examples of degemination. Carr (2008:39) defines it as a process in which a geminate segment is simplified to become non-geminate. In Dorze, Amharic origin words like the examples stated below are pronounced with a nongeminate /m/, /r/ and /z/ respectively. Further, the degemination also results in vowel lengthening.

Amharic	Dorze	
/c'amma/	/c'aama/	'shoes'
/surri/	/suuri/	'trousers'
/ʔazzo/	/ʔaazo/	'crocodile'

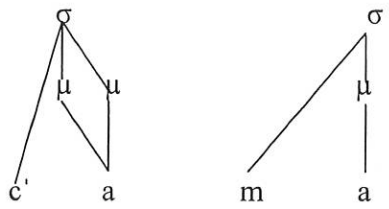
Let's see how the syllable of each word is affected using diagrams.

a.



/c'amma/ 'shoe'

b.



/c'aama/ 'shoe'

As displayed in the diagrams above, the geminate Amharic word /c'amma/ changes into /c'aama/. The geminate sound /m/ which serves as a weight bearing unit becomes degeminated. Further, the vowel preceding it gets lengthened and becomes bimoraic. This, then, results into two syllable shapes: CVV and CV. This also works for /suuri/ 'trousers' and /ʔaazo/ 'crocodile'. From the above discussion it is possible to infer that there is CL which results in degemination and lengthening of another. According to Hayes (1989:258), the theory of CL is restricted to those languages in which coda consonants contribute weight to the syllable. (See section 1.8.3.2)

4.4 Suffixation

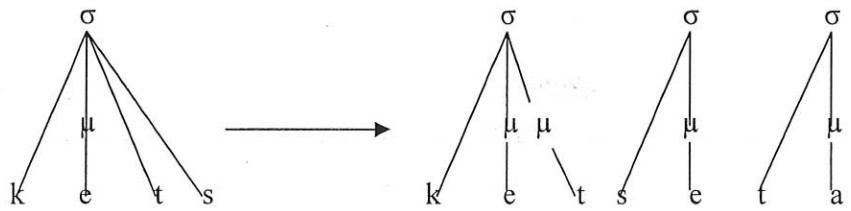
Suffixation is a process of attaching an element to a stem. The element attached comes next to the stem. In Dorze, an attachment of /—eta/ is a dominant way of forming plurals. Look at the following data.

	Singular	Plural	Gloss
a.	/kets/	/ketseta/	'houses'
b.	/suuns/	/s'uunseta/	'fingernails'
c.	/ʔaas/	/ʔaaseta/	'ʔaaseta'
d.	/kutto/	/kutteta/	'hens'
e.	/kana/	/kaneta/	'dogs'

As can be seen from the above data, plural in Dorze is formed in two ways. The first way is that if a noun ends in a consonant, the plural is then formed by attaching /—eta/ to the base. The other way is that if a noun ends in a vowel, there is deletion of the stem final vowel.

One of the functions of the syllable is that it serves as a domain of application for different morphophonemic processes. The attachment of the plural marker /—eta/ is done at the syllable boundary. Similarly, it also changes the syllable structure of the singular words.

Let's see how the syllable structure of the singular word /kets/ is affected when it becomes the plural /ketseta/ 'houses'.



As shown above, the monosyllabic CVCC syllable changes its shape into CVC.CV.CV when it attaches a plural morpheme. Besides, the CVC syllable in the plural word becomes a weight bearing unit by WbP rule. This means that the rule gives closed syllables heavy when they come as geminate or cluster at word medial position.

4.5 Reduplication

Reduplication is a morphophonemic process where all or parts of a stem is reduplicated or doubled so as to have a new noun or adjective in Dorze. Carr (2008:145) defines it as a morphological process in which segmental material from a base is copied. For instance, a plural of a noun can be formed by total reduplication of the singular noun — /naʔa/ 'child' is copied as /naʔa naʔa/. It is also true with adjectives. For example, /kˈeriz/ 'small' reduplicates itself and then we have /kˈeriz kˈeriz/. We can consider that the syllable is a domain of application for the process of reduplication. Bussmann (1996:989) says that repetition of morphemes indicates a strengthening of the expression in word formation.

Chapter Five

Summary and Conclusion

The foremost objective of the study was to describe and discuss the syllable structure and syllable based morphophonemic processes in Dorze. Thus, the thesis discussed two major issues: syllable structure and syllable based morphophonemic processes. These are discussed in chapter 3 and 4 consecutively. The Moraic account of autosegmental phonology is employed to treat the syllable structure. As opposed to other theories like CV skeleton and X skeleton, I found this theory to best represent and treat features like vowel lengthening, gemination, word medial consonant cluster that are common in Dorze. (See section 1.8.3.1)

In this chapter, I have tried to provide a brief overview of each chapter and show possible areas for further study.

In the realm of chapter one, I have presented a brief introduction about Dorze — an Omotic language spoken in Dorze town which is located 30 km from Arbaminch, the people, rationale, objectives, scope and significance of the study. Furthermore, a concise summary of previous works, methodology employed and the theoretical framework are presented.

Chapter two presents the general description of the phonology of Dorze. The major issues treated include distribution of the consonant phonemes, gemination, vowel phonemes, and vowel length.

In chapter three, I have examined syllable and syllable related issues. In the first place, general description of the nature of the syllable structure is presented. Moreover, elements or constituents of the syllable— onset and rhyme (nucleus plus coda where the nucleus is obligatory while coda is optional depending on the nature of the language), types of the syllable like monosyllable, disyllable and multisyllable, open versus closed syllable, heavy versus light syllable with specific examples from Dorze are treated. In the

second place, phonotactics and syllabification are elaborated. This is then followed by discussions on basic syllable types of Dorze and Moraic analysis.

In chapter four, some syllable based morphophonemic processes in Dorze are discussed. These include assimilation, deletion, insertion, suffixation and reduplication.

Based on the findings, I drew the following conclusions. The major syllable types identified for Dorze are V, CV, CVC, CVVC, CVCC, CVVCC, VC and CVV. It is identified to be a type IV language in which a vowel alone can be a syllable. For instance, in /o.la/ 'war', the first syllable is a vowel in isolation. In addition, the CV syllable is the frequently exhibited syllable in most words.

Moreover, the CV syllable is considered to be a light syllable whereas a CVC syllable is light. In some instances like gemination and word medial consonant cluster, the geminate and the first element of a cluster are assigned mora by WbP. For instance, /ʃoʃ/ 'snake' that has CVC shape is light where as in /pendərs/ 'lip', which is a disyllable word, the coda of the first syllable /n/ takes mora. From the view point of phonotactics, in Dorze onset consonants are optional. Besides, a maximum of two consonants is allowed at syllable final position. There are Dorze words borrowed from Amharic like /ʃinkurt/, /wərk'/ and /tɨk'ɨmt/ ending with **-rt**, **-rk'** and **-mt** clusters respectively at word final position which is impermissible in Dorze. Therefore, the insertion of the final vowels /o/, /a/ and /e/ consecutively becomes significant so as to match the phonotactic constraints of the language.

Though, as elaborated in section 1.8.2, syllable can serve as a domain of stress, it is not explored in this study because it goes beyond the objective of the study. Further consideration even whether or not Dorze is a stress or a tonal language would be of interest. Furthermore, the status of /ɸ/, /ɨ/ and /ə/ is in a question. Therefore, I leave these topics for further discussion and experimental investigation.

Appendix A: Data on the Basic Lexicon of Dorze

S. No	Transcription	Gloss
1	/iske/	'hair'
2	/huɸe/	'head'
3	/konke/	'forehead'
4	/waje/	'ear'
5	/ʃuʔirəs/	'hear'
6	/duuna/	'mouth'
7	/oʃinc/	'blow'
8	/jəs'irəs/	'sing'
9	/durirəs/	'dance'
10	/karabo/ or /dinke/	'drum'
11	/pendərs/	'lip'
12	/ʔacci/	'teeth'
13	/int'ərs/	'tongue'
14	/c'ucc/	'saliva'
15	/maldɗo/	'sweat'
16	/gac'o/	'chin'
17	/buuc/	'beard'
18	/siiɗe/	'nose'
19	/s'ink'o/	'bad smell'
20	/ʔajɸe/	'eye'
21	/beʔirəs/	'see'
22	/ jəkkirəs/	'weep'
23	/ʔaɸuns/	'tear'
24	/k'ooɗe/	'neck'
25	/haaccike/	'shoulder'
26	/t'ans/	'breast'

27	/gaawo/	'belly'
28	/gullaʔa/	'navel'
29	/ilint'ərs/	'guts'
30	/morge/	'nape of neck'
31	/zokko/	'back'
32	/miskata/	'buttock'
33	/gulbata/	'knee'
34	/k'ese/	'elbow'
35	/tooho/	'foot'
36	/kuʃe/	'hand'
37	/s'uuns/	'fingernail'
38	/galba/	'skin'
39	/mək'ets/	'bone'
40	/wəzana/	'heart'
41	/suts/	'blood'
42	/tire/	'liver'
43	/mits/	'tree'
44	/kalta/	'axe'
45	/ginde/	'root'
46	/waje/	'leaf'
47	/wəɗoro/	'rope'
48	/keece/	'basket'
49	/zərets/	'seed'
50	/s'ojle/	' small hoe(n)'
51	/kas'ojle/	'big hoe (n)'
52	/gojrəs/	'dig'
53	/baɗala/	'maize'
54	/tanbo/	'tobacco'
55	/maata/	'grass'
56	/habəba/	'flower'

57	/wək'irəs/	'rotten'
58	/ʔaʃo/	'meat'
59	/k'ans'irəs/	'cut'
60	/kajstirəs/	'steal'
61	/ingirəs/	'give'
62	/ordɐ/	'fat'
63	/pˈupˈpˈule/ or /ʔɨnk'ulale/	'egg'
64	/gəɸa/	'hunger'
65	/katsirəs/	'cook'
66	/mirəs/	'eat'
67	/ʔujrəs/	'drink'
68	/mic'irəs/	'laugh'
69	/kəsirəs/	'vomit'
70	/k'ufirəs/	'cough'
71	/t'iʃirəs/	'sneeze'
72	/sakkitrəs/	'sick'
73	/kundirəs/	'fall'
74	/boosa/	'grave'
75	/ʔeejaa/	'fool'
76	/issino/	'one'
77	/namʔa/	'two'
78	/hedza/	'three'
79	/ʔojd/	'four'
80	/ʔicəcc/	'five'
81	/usuppun/	'six'
82	/lappun/	'seven'
83	/ospun/	'eight'
84	/ʔoɗuɸun/	'nine'
85	/taam/	'ten'
86	/namitam/	'twenty'

87	/s'et/	'hundred'
88	/ʔaas/	'man'
89	/k'oppirəs/	'think'
90	/mac'as/	'woman'
91	/ʔekkirəs/	'marry'
92	/macco/	'wife'
93	/ʔojcirəs/	'ask'
94	/naʔa/	'child'
95	/hamtirəs/	'walk'
96	/wəs's'irəs/	'run'
97	/ʃəmpirəs/	'rest'
98	/təmarsirəs/	'teach'
99	/s'os/	'God'
100	/suns/	'name'
101	/mehe/	'animal (domestic)'
102	/ɗoʔa/	'animal (wild)'
103	/ʃanka/	'hunter'
104	/ʃankatirəs/	'hunt'
105	/gojna/	'tail'
106	/c'unc'ale/	'ant'
107	/lahuns'e/	'worm'
108	/piradrəs/	'fly'
109	/ʔaacəre/	'spider'
110	/məts/	'honeybee'
111	/kots/	'beehive'
112	/ʔees/	'honey'
113	/deeʃ/	'goat'
114	/miiz/	'cow'
115	/hare/	'donkey'
116	/kutto/	'chicken'

117	/kəɸo/	'bird'
118	/k'efo/	'wing'
119	/bale/	'feather'
120	/kets/	'nest'
121	/ʃoʃ/	'snake'
122	/ʔecəre/	'rat'
123	/wədirəs/	'kill'
124	/molee/	'fish'
125	/wanaʔirəs/	'swim'
126	/t'ok'ərs/	'frog'
127	/wədoro/	'thread'
128	/sikkirəs/	'sew'
129	/k'accirəs/	'tie'
130	/ʔaazo/	'crocodile'
131	/babbo/	'fear'
132	/gələʃo/	'monkey'
133	/gawara/	'cat'
134	/godəre/	'hyena'
135	/kana/	'dog'
136	/ʃirəs/	'hear'
137	/ʔukkirəs/	'bark'
138	/jirəs/	'come'
139	/muuze/	'banana'
140	/wərgirəs/	'want'
141	/tajɸirəs/	'count'
142	/ʔekkirəs/	'take'
143	/ʔajkirəs/	'hold'
144	/kets/	'house'
145	/gelirəs/	'enter'
146	/keʔirəs/	'exit'

147	/ʔotsirəs/	'make'
148	/ʔeʔirəs/	'stand'
149	/ʔoto/	'pot'
150	/təma/	'fire'
151	/s'ugirəs/	'burn'
152	/hoʔo/	'hot'
153	/irs'a/	'cold'
154	/k'erəs'amits/	'firewood'
155	/c'uaa/	'smoke'
156	/buɗo/	'ashes'
157	/ʃucc/	'stone'
158	/saʔa/	'earth'
159	/ʔurk'a/	'mud'
160	/bitta/	'sand'
161	/gudulo/	'dust'
162	/wərk'a/	'gold'
163	/bira/	'money'
164	/ʃamiris/	'buy'
165	/bajzirəs/	'sell'
166	/gaje/	'market'
167	/dagəte/	'mountain'
168	/c'ərk'o/	'wind'
169	/guule/	'cloud'
170	/ʔira/	'rain'
171	/zokko/	'bridge'
172	/hats/	'water'
173	/ʔabba/	'lake'
174	/səlo/	'sky'
175	/t'umirəs/	'night'
176	/ʔajnno/	'noon'

177	/s'oʔinte/	'star'
178	/ʔawa/	'sun'
179	/boʔots/	'white'
180	/kərits/	'black'
181	/zoʔo/	'red'
182	/c'ilila/	'green'
183	/galalʔo/	'yellow'
184	/mook'e/	'knife'
185	/ola/	'war'
186	/olatto/	'fight'
187	/ʔitta/	'bad'
188	/loʔo/	'good'
189	/paaca/	'wide'
190	/s'uns/	'narrow'
191	/sitta/	'straight'
192	/ʔadus/	'long'
193	/k'ans/	'short'
194	/wəggaz/	'big'
195	/k'eriz/	'small'
196	/ʃuugo/	'thick'
197	/leʔe/	'thin'
198	/orde/	'heavy'
199	/galʔa/	'old'
200	/orats/	'new'
201	/daro/	'all' 'many'
202	/ʔankoka/	'none'
203	/hadrɨs/	'left'
204	/ʔuʃc/	'right'
205	/ʔe/	'yes'
206	/ʔakkaj/	'no'

207	/des'o/	'hard'
208	/ʃawho/	'soft'
209	/guts/	'few'
210	/ʔaɸa/	'up'
211	/gars/	'down'
212	/hajsa/	'this'
213	/ʔekkisa/	'that'
214	/ʔoone/	'who'
215	/ʔodeze/	'whose'
216	/ʔawar/	'what'
217	/kasse/	'yesterday'
218	/ʔaane/	'where'
219	/hajsan/	'here'
220	/wəʔe/	'how'
221	/ʔajs/	'why'
222	/məla/	'dry'
223	/ʔita/	'dirty'
224	/ʔankokaba/	'empty'
225	/kumət͡s/	'full'
226	/lawirəs/	'yawn'
227	/ʔiccirəs/	'sleep'
228	/taana/	'I'
229	/nena/	'you (sing)'
230	/iza/	'he'
231	/nuuna/	'we'
232	/intəna/	'you (pl)'
233	/ista/	'they'
234	/sugrəs/	'push'
235	/dafirəs/	'pull'
236	/t'ikkirəs/	'jump'

237	/ʔoje/	'road'
238	/lacc/	'fence'
239	/penge/	'door' 'gate of a compound'
240	/pas'a/	'(be) healthy, well'
241	/sakitrəs/	' (be) sick'
242	/t'aale/	'medicine'
243	/loʔirəs/ or /pas'irəs/	'get well, recover'
244	/gawəraʔirəs/	'pregnant'
245	/dic'irəs/	'grow up'
246	/c'imirəs/	'(be) old'
247	/hajʔirəs/	'die'
248	/jəkkirəs/	'cry'
249	/ʃinətrəs/	'(be) angry'
250	/mente/	'twin'
251	/geelaʔo/	'virgin'
252	/c'ima/	'old person'
253	/majze/	'grand parent'
254	/ʔadde/	'father'
255	/ʔaajo/	'mother'
256	/ʔiiʃ/	'brother'
257	/micco/	'sister'
258	/ʔaddeʔiiʃ/	'uncle (father's brother)'
259	/ʔajeʔiiʃ/	'uncle (mother's brother)'
260	/bajrəna/	'firstborn'
261	/ʔadena/	'son'
262	/mac'ana/	'daughter'
263	/naʔa naʔa/	'grandchild'
264	/ʔazɨna/	'husband'
265	/sogiddo/	'family'
266	/lage/	'friend'

267	/guta/	'neighbor'
268	/dassanca/	'weaver'
269	/zallanca/	'trader'
270	/wəsanca/	'beggar'
271	/koppija/	'hat'
272	/ʃaamize/	'shirt'
273	/suure/	'trousers'
274	/c'aama/	'shoe'
275	/ʔaaʃo/	'meat'
276	/modo/	'fat'
277	/ʔawəza/	'pap'
278	/t'ile/	'floor'
279	/mas'ine/	'salt'
280	/maats/	'milk (n)'
281	/dana/	'beer (traditional)'
282	/bacce/	'cooking stone'
283	/c'əccəmits/	'pestle'
284	/udule/	'mortar'
285	/borsa/	'bag'
286	/kərəbo/	'big drum'
287	/susule/	'flute'
288	/wəsirəs/	'pray'
289	/boora/	'ox'
290	/ʔus/	'heifer'
291	/marr/	'calf'
292	/dors/	'sheep'
293	/kutto/	'chicken'
294	/dakkɨjo/	'duck'
295	/k'aare/	'monkey'
296	/kanabaaco/	'jackal'

297	/gitole/	'dove'
298	/gege/	'tortoise'
299	/mas'as'o/	'sweet potato'
300	/dɨnnɨcco/	'potato'
301	/tammane ʔissiz/	'eleven'
302	/tammane nam/	'twelve'
303	/tammane hedz/	'thirteen'
304	/tammane ojd/	'fourteen'
305	/tammane cəcc/	'fifteen'
306	/tammane usupun/	'sixteen'
307	/tammane lappun/	'seventeen'
308	/tammane ospun/	'eighteen'
309	/tammane uduɸun/	'nineteen'
310	/namitamane issino/	'twenty one'
311	/namitamane namʔa/	'twenty two'
312	/hedzitam/	'thirty'
313	/ojditam/	'forty'
314	/iccəctam/	'fifty'
315	/usupuntam/	'sixty'
316	/lappuntam/	'seventy'
317	/ospuntam/	'eighty'
318	/uduɸuntam/	'ninety'
319	/nammis'et/	'two hundred'
320	/iccacis'et/	'five hundred'
321	/ʃɨje/	'thousand'
322	/issinso/	'(be) first'
323	/namanso/	'second'
324	/hedzanso/	'third'
325	/wursəts/	'(be) last'
326	/saŋŋo/	'Monday'

327	/maksaɲɲo/	'Tuesday'
328	/orowa/	'Wednesday'
329	/hamusa/	'Thursday'
330	/ʔarba/	'Friday'
331	/k'era/	'Saturday'
332	/wəgga/	'sunday'
333	/wənta/	'morning'
334	/umade/	'evening'
335	/giddots/	'midnight'
336	/ʃinkurto/	'onion (red)'
337	/timatime/	'tomato'
338	/k'ara/	'red paper'
339	/tuuma/	'onion (white)'
340	/zore/	'advice'
341	/giligərs/	'armpit'
342	/səro ʔak'ar/	'good morning'
343	/waka peʔar/	'good afternoon'
344	/məskərəme/	'September'
345	/t'ik'imte/	'October'
346	/hidare/	'November'
347	/tasase/	'December'
348	/t'ire/	'January'
349	/jəkkatite/	'February'
350	/məggabite/	'March'
351	/mazja/	'April'
352	/ginbote/	'May'
353	/sane/	'June'
354	/hamle/	'July'
355	/nase/	'August'
356	/sawo/	'smell'

357	/kajso/	'thief'
358	/k'andɛ/	'breakfast'
359	/las'a/	'lunch'
360	/kəwo/	'dinner'
361	/ʔuʃ/	'drink' (n)
362	/kats/	'grain' 'pennis'
363	/dacco/	'basket'
364	/bacco/	'fox'
365	/bats/	'a big local water container'
366	/koʃ/	'shadow'
367	/sˈaro/	'small pot'
368	/waro/	'water cannel'
369	/karo/	'tip'
370	/kˈata/	'cover of a bamboo tree'

Appendix B: Plural Marking in Dorze

1.	/miiz/	'cow'	/miiz*eta*/	'cows'
2.	/kets/	'house'	/kets*eta*/	'houses'
3.	/ojde/	'chair'	/ojd*eta*/	'chairs'
4.	/kutto/	'hen'	/kutt*eta*/	'hens'
5.	/gamo/	'lion'	/gam*eta*/	'lions'
6.	/waje/	'ear'	/waj*eta*/	'ears'
7.	/ʔajɸe/	'eye'	/ʔajɸ*eta*/	'eyes'
8.	/tˈans/	'breast'	/tˈans*eta*/	'breasts'
9.	/kuʃe/	'hand'	/kuʃ*eta*/	'hands'
10.	/sˈuuns/	'fingernail'	/sˈuuns*eta*/	'fingernails'
11.	/məkˈets/	'bone'	/məkˈets*eta*/	'bones'
12.	/kalta/	'axe'	/kalt*eta*/	'axes'
13.	/keece/	'basket'	/keec*eta*/	'baskets'
14.	/boosa/	'grave'	/boos*eta*/	'graves'
15.	/ʔaas/	'man'	/ʔaas*eta*/	'men'
16.	/kəɸ*o*/	'bird'	/kəɸ*eta*/	'birds'
17.	/ʃoʃ/	'snake'	/ʃoʃ*eta*/	'snakes'
18.	/molee/	'fish'	/molee*ta*/	'fishes'
19.	/gələʃ*o*/	'monkey'	/gələʃ*eta*/	'monkeys'
20.	/gawar*a*/	'cat'	/gawar*eta*/	'cats'
21.	/godare/	'hyena'	/godar*eta*/	'hyenas'
22.	/kan*a*/	'dog'	/kan*eta*/	'dogs'
23.	/kets/	'house'	/kets*eta*/	'houses'
24.	/ʃucc/	'stone'	/ʃucc*eta*/	'stones'
25.	/lacc/	'fence'	/lacc*eta*/	'fences'
26.	/ʔadde/	'father'	/ʔadd*eta*/	'fathers'
27.	/ʔaajo/	'mother'	/ʔaaj*eta*/	'mothers'
28.	/lage/	'friend'	/lag*eta*/	'friends'
29.	/guta/	'neighbor'	/gut*eta*/	'neighbors'

30.	/sure/	'trouser'	/sure*ta*/	'trousers'
31.	/c'aam*a*/	'shoe'	/c'aame*ta*/	'shoes'
32.	/ʔuʃ/	'heifer'	/ʔuʃ*eta*/	'heifers'

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