

THE PHONOLOGY OF ANFILLO

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By
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DEDICATION

This thesis is dedicated to my beloved grandmother the late Emahoy Yewoginesh Tefalet'.

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SYMBOLS AND ABBREVIATIONS

σ	Syllable
O	Onset
R	rhyme
N	nucleus
C	coda
C	Unit of a skeletal tier representing a consonant
V	Unit of a skeletal tier representing a vowel
X	Unit of a skeletal tier representing a consonant or a vowel
R	root boundary
#	word boundary
ϕ	Zero
*	ill-formed
—>	becomes
—	position of a sound
/ /	Phonemic transcription
[]	phonetic transcription
[_o]	devoiced
3	third
aff	affix
ant	anterior
bak	back
cns	consonantal
cnt	continuant
cor	coronal
csr	constricted
eje	ejective
f.	feminine
hig	high

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imp.	imperative
IWP 1	intervocalic weakening process 1
IWP 2	intervocalic weakening process 2
IWR 1	intervocalic weakening rule 1
IWR 2	intervocalic weakening rule 2
juss.	jussive
lat	lateral
m.	masculine
nas	nasal
pl.	plural
rnd	round
sg.	singular
son	sonorant
suff.	suffix
vd	voiced
vls	voiceless
voi	voice
WF	Word final
WI	Word initial
WM	Word medial



ABSTRACT

This thesis tries to give a brief description and analysis of the phonology of Anfillo language in the framework of Non-linear Phonology.

Chapter one gives background information about the language and the people. It also introduces the theoretical models utilized in the study.

Chapter two presents the description of the consonant and vowel phonemes along with their underspecified distinctive feature matrices and the relevant redundancy rules.

Chapter three deals with the syllable structure, the distribution and co-occurrence restrictions of the segments, and the phonological processes.

CHAPTER ONE

1. INTRODUCTION

1.1 The Language

Anfillo is one of the least known Ethiopian Languages. It is spoken in the extreme north of Gambella Region (Region 12). The language is also called Southern Mao by Grottanelli (1940), Bender (1971) and other scholars, and is different from the Northern Mao. We shall use the name Anfillo to refer to the language because, as Fleming (1976b:363) has pointed out, 'Mao appears now to be more useful as a designation for a distinct branch of Northern Omotic'.

In Bender (1976:4) the Anfillo language is classified as Omotic by family, Northern omotic by sub - family¹, Kafa - Gimojan by group and kafa by sub-group. The Kafa sub-group, which includes kafa, Shinasha and Anfillo, is alternatively called Gongga sub-group. As reported in the above sources and also observed by the present researcher, there is no significant dialectal variation within Anfillo.

Field observations reveal that the language is on the edge of extinction because of the strong influence of the neighbouring Oromo. The younger members of the people have already 'shifted their mother tongue' to Oromo. The elders also speak Oromo as a second language. When this

old generation dies, the language will inevitably die, too, and as it is not a written language, its death will lead to an irrecoverable loss of heritage.

1.2 The People

It is widely told by the elders of the community that the original place of the Anfillo people was somewhere in the Kafa province. According to oral traditions, they are migrated from that province centuries ago, crossed Illubabor, and finally arrived at their present settlement. Sometime after their arrival they became encircled and gradually intermingled with the Oromo new comers.

In the past, the Anfillo people had their own unique culture and religious practices like Do'o, Gupo, S'ungu, etc. Now, because of the influence of the surrounding, they have almost given up all of their animist practices and follow the Ethiopian Orthodox Christianity, the Adventist Church, and the Islamic Religion.

There are many clans within the Anfillo society. Some of the significant ones are K'etso, Dibo, Udo, Toko, Yobetto, Datso and Goga.

The main occupation of the people is farming and the main agricultural product is coffee.

1.3 Previous Studies

There are very few works on this language done previously. Most of them are limited to lists of words, phonological and grammatical sketches done for the purpose of historical reconstruction and classification.

Grottanelli (1940) published an ethnographic monograph on the Mao people of Western Wollegga, that includes several hundred words of Anfillo (Southern Mao) and Northern Mao.

Cerulli (1938b and 1951), in his Kafa study especially, had some Anfillo data.

Bender (1971), similarly, had collected some lists.

Fleming (1976b), in his article "Kafa (Gonga) Languages", discusses some aspects of Anfillo in comparison with the other Gonga languages. With respect to the phonology of Anfillo, which is relevant here, Fleming (1976b:370) states the following:

Anfillo also requires more data for phonemicization because, although there is a total corpus of around 500 items, the deficiency in Grottanelli's transcription of glottalic consonants are great. But it would appear that /b/, /p/, /f/, /m/, /w/, /d/, /t/, /t'/, /ʃ/, /ts (c)/, /ts' (c')/, /j/, /y/, /l/, /r/, /n/, /k/, /g/, /k'/, /h/, /?/ can be established as well as universal Gonga vowels "as in Italian". The status of [p'], [r^h], [r'^h], [s], [z], and a labial which Grottanelli writes as [P^h] are in doubt.

The list of the above consonant phonemes compared with the present researcher's description lacks the phonemes /p'//, /dz/and/s'/. On the other hand, Fleming's list includes two more phonemes, /f/and /j/, which are not found in the data of the present study. Among the consonants that Fleming is in doubt about their status, [r^h] and [r[?]] are found to be allophones of /t/ and /t'/. [s] and [z] are found to be phonemes and alternants of /ts/ and /dz/ at the same time. But [P^h] is not found at all in the present study.

Fleming did not report anything about length and tone. But in the present study contrastive length of both vocalic and consonantal and two distinct tone² levels (high and low) are found. In this study, tone is not treated because our purpose now is to show a non-linear account of the segmental phonology of the language that was previously described linearly.

THE PHONOLOGY OF MAO (ANFILLO) by Gebre Bizuneh (1986b) (unpublished) is the first formal linguistic description of the language. Here, the phonemes are identified³; their distribution, co-occurrence, and frequency are presented. The phonological processes are also described in the SPE framework of Chomsky and Halle (1968).

SOME PROBLEMS IN THE PHONOLOGY OF MAO (ANFILLO) by Gebre Bizuneh (1987) is another attempt on the phonology. This paper deals with the phonemic status of labials and sibilant sounds of the language.

1.4 The Objectives of the Present Study

In the previous linear analysis of the phonology of the language, it was impossible to give a straightforward account of certain facts (i-viii below) of distribution, co-occurrence, and segmental phonological processes.

- (i) Affricates and geminates occur only in words medial intervocalic position.
- (ii) Long vowels are not found before geminates and clusters of consonants. In other words, contrasts of long and short vowels are not found before geminates and clusters of consonants.
- (iii) Clusters of two consonants are found only medially.
- (iv) The first member of the clusters is always a sonorant.
- (v) A vowel is nasalized (a) before a nasal/obstruent cluster, (b) before a geminate nasal, and (c) before a word final non-geminate nasal. But a vowel is not nasalized simply before a nasal consonant. Hence, the process is limited to those three environments, and hence a single

generalization of nasalization is impossible.

- (vi) The phonological processes of epenthesis and spirantization of affricates are applied when some segments occur in juxtaposition. Vowel epenthesis is applied between a word medial cluster of (a) velar and liquid consonants, (b) sonorant and geminate consonants, and (c) a word final cluster of two or three consonants. Glide epenthesis is applied between cluster of vowels. Fricativization of affricates is applied in clusters of nasal and affricate consonants. But we cannot find a generalization that can straightforwardly capture such processes as a whole (or at least, the epenthesis processes as a whole).
- (vii) The bilabial stops, /p/ and /p/, and the alveolar stops, /t/ and /t'/ are weakened to /β/ and /b/, and [r^h] and [r^ʔ], respectively, in intervocalic positions. But this process does not weaken the geminate counterparts of the phonemes in the same environments. On the other hand, root final geminate stops are weakened intervocalically in the imperative and jussive forms. In addition to /pp,bb,tt,t't'/, /kk,k'k,ts/ are also weakened in the same environment (in the imperative and jussive forms) to [h,ʔ,ʃ], respectively. Other than stating the facts, it is difficult to understand particularly how

intervocalic weakening takes place.

- (viii) Consonants are palatalized before front vowels. But velars and non-velars are palatalized differently. When velars become palatals, non-velars add only a secondary place of palatal articulation without changing their primary point of articulation. Similarly, as in (vii) above, the same weakening process weakens different consonants differently: the bilabial stops become [p̠] and [b̠], the alveolar stops become [r^h] and [r^ʔ], the alveolar affricate become [ʃ̠], and the velar stops become [h], and [ʔ]. We cannot account for the asymmetry of the input and output of the processes.

But the difficulty in generalization arises from the exclusion of the syllable structure of the language and other related phonological notions.

Therefore, the objective of the present study is to re-examine the phonology of the language in the framework of non-linear phonology paying special attention to syllable structure.

1.5 Significance of the Study

This study may contribute to the meagre linguistic

literature of Anfillo, in particular, and Omotic languages, in general. In the future, the study may serve as a source of information to people who study further the phonology of Anfillo, and historical and comparative Omotic in general.

Moreover, the study will be a resourceful document preserving some aspects of a language which is at the verge of extinction.

1.6 Methods of the Study

1.6.1 Source of Data

The data of the present study is obtained from the previous paper "THE PHONOLOGY OF MAO (ANFILLO)" (Gebre, 1986b) and from three native speakers and five translators (translators of Amharic and English to Oromo).

1.6.2 Theoretical Framework

In this study the non-linear, autosegmental approach is employed. One of the advantages of this approach is its recognition of the syllable as a phonological unit. In the linear SPE model, the syllable was excluded from the analysis because it was believed that a segment-based analysis that focuses on the segments and boundaries only was sufficient. The need for the recognition of the syllable arises later mainly for the reasons that a segment

based description cannot adequately specify the phonotactic restrictions, and express syllable related phonological rules and as a result certain important generalizations would be missed.

As we shall see in the forthcoming discussions, a syllable-based analysis will handle the phonological processes of Anfillo straightforwardly, and describe the phonotactic restrictions adequately.

In analyzing the syllable structure of the language the notion of autosegmental licensing is utilized. This was first introduced in Goldsmith (1990). It is claimed that licensing serves to link autosegmental structure with the hierarchical structure of the syllable (Goldsmith, 1990:5).

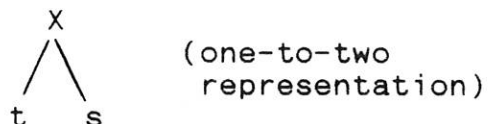
There are prosodic units that are licensors. The syllable node is a primary licensor, whereas the coda and certain word final morphemes are secondary licensors. The primary licensor licenses all the distinctive features of the language in the combined domain of the onset-nucleus span, while the secondary licensors license a subset of the distinctive features of a language in a coda or in word final positions. In other words, one can find all segment contrasts in the onset-nucleus span, but only some (not all) of the segment contrasts in the coda or in word final morphemes.

In Anfillo, as will be given in chapter three, the occurrence of only sonorants and first members of the geminate halves in the coda position can be accounted for in autosegmental licensing. There are also phonological rules of epenthesis (and deletion) that can be well accounted for by the same notion of the autosegmental licensing.

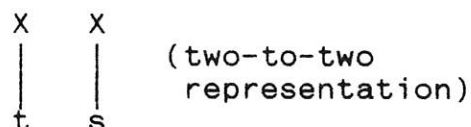
Another advantage of the non-linear approach is its recognition of the skeletal tier⁴ (timing tier) as an independent level in phonological representation. The skeletal tier is the tier whose units are associated with the syllable positions of onset, nucleus and coda, on the one hand, and with the segmental tier (phonemic tier) units, on the other. Suprasegmental features, or harmonic features on separate autosegmental tiers may also be associated with the units of the skeletal tier.

In recognizing the skeletal tier for Anfillo, varying representation of the segments of the language (quantity-wise) to express their phonetic and phonological behavior is possible. In addition, making distinctions between the segmental phonological rules that apply on the skeletal tier and that apply on the segmental tier is possible. For example, the 'coda and intervocalic weakening rules' dealt with in chapter three can be distinguished in such a way.

In describing assimilation, the segmental features

(3) Surface

It is just like a contour tone that composed of two independently existing tone units associated with one tone bearing element.

(4) Underlying

(The underlying representation of affricates in terms of two skeletal and two segmental tier units, as will be justified in the discussion made in chapter three, is based on the patterns of distribution, co-occurrence and phonological processes).

Under-specification Theory (Pulleyblank 1983 and 1986, and Archangeli 1984), which is one of the developments in non-linear phonology, is utilized in the analysis. The main ideas of this theory, as summarized in Goldsmith (1990: 243) in two principles, are:

- (i) 'eliminate redundant features from the lexical phonology'. This means, we have to use the

minimum number of features necessary to keep the phonemes of a language distinct.

- (ii) 'eliminate unmarked feature specifications from underlying forms'. This means, we have to specify the 'marked' or the less predictable feature values in underlying representations.

As we can classify and differentiate segments of a language by the distinctive features they are composed of and account for their phonological patterning, we can also classify and differentiate them by their relative articulatory strength and likewise account for certain phonological phenomena. The range within which the relative strength of segments is expressed is referred to in the literature as strength Hierarchy, or its inverse, sonority Hierarchy (Bloch and Trager 1942:22; Selkirk 1982a; Katamba 1989: 103-108; Goldsmith 1990:111, and Elsewhere).

The strength hierarchy of segments can be drawn on the basis of certain phonetic parameters: Voicing, Manner of Articulation, Point of Articulation and others. For example, (>indicating a step towards a 'weaker' Pronunciation) Voiceless > Voiced (based on voice quality); Stop > Affricate > fricative ... (based on manner of articulation); Bilabial > Alveolar > Palatal ... (based on place of articulation).

Phonological processes that move segments up the strength hierarchy are called Strengthening (Fortition) processes while those which move segments down the strength hierarchy are called Weakening (Lenition) processes. There are also some phonological processes which are sensitive to the relative strength of segments; i.e. the effect of a strength-sensitive process varies depending on the relative strength of the segments involved.

As we shall see in chapter three, palatalization and intervocalic weakening processes of Anfillo can be fruitfully examined and the asymmetry of their input and output patterns can be insightfully accounted for if we apply the notion of strength hierarchy.⁶

Notes to Chapter One

1. The language is classified as Northern Omotic in a North/South classification of the family; but in a different East/West classification made by Fleming (1976a:47) it is classified as Western Omotic (other things being equal).
2. The two tone levels are identified on the basis of the following pairs of words (´ marks high tone; ` marks low tone):

kárò	'horn'	gínò	'spear'
kànò	'dog'	kíśó	'hand(palm)'
màngó	'heavy'	s'àllò	'porcupine'
yòngò	'wind'	s'úlló	'small'
3. r^h and r[?] were wrongly identified as phonemes. But in the present study, they are found to be allophones of /t/ and /t'/, respectively.
4. The skeletal tier as an autosegmental tier was first proposed in McCarthy (1979; and also 1981 and 1982). Though McCarthy's work has great phonological interest, his concerns are primarily morphological.
5. Formally, the segmental tier units are matrices of distinctive features, but for convenience we put them orthographically using letters of the phonetic alphabet.
6. Constituents of the syllable can also be characterized on universal and language-particular basis by the notion of strength / sonority Hierarchy.

CHAPTER TWO

2. THE CONSONANT AND VOWEL SYSTEMS

In this chapter, a description of the consonant and vowel system of Anfillo will be given.

2.1 The Consonant System

2.1.1 Consonant Phonemes

Anfillo has the following twenty-two consonant phonemes:

		Bilabial	Alveolar	Alveo-palatal	Palatal	Velar	Glottal
Stop	vls	p	t			k	ʔ
	vd	b	d			g	
	eje	p'	t'			k'	
Fricative	vls			ʃ			h
	eje		s'				
Affricate	vls		ts				
	vd		dz				
	eje		ts'				
Nasal		m	n				
Liquid	lat		l				
	flap		r				
Glide		w			y		

Chart 1. The Consonant Phonemes

The phonemes are established on the basis of the following minimal and near minimal (analogous) pairs:

(5) (a) /p/ : /b/	/aapo/	'eye'
	/aabo/	'sun (day)'
(b) /p/ : /p'/	/daapo/	'surprise'
	/daap'o/	'snake'
(c) /t/ : /d/	/tibbo/	'bat'
	/dibbo/	'hand'
(d) /t/ : /t'/	/tallo/	'mud'
	/t'allo/	'clean'
(e) /k/ : /g/	/kašo/	'breath'
	/gašo/	'tooth'
(f) /k/ : /k'/	/kaaro/	'fight'
	/k'aro/	'horn'
(g) /ʔ/ : /h/	/šaʔo/	'sm ile '
	/šaho/	'flower'
(h) /ts/ : /dz/	/keetso/	'house'
	/keedzo/	'three'
(i) /ts/ : /ts'/	/utso/	'drink'
	/ats'o/	'sharp'
(j) /ts'/ : /s'/	/ats'o/	'sharp'
	/mas'o/	'collect'
(k) /ts/ : /š/	/maatso/	'woman'
	/maašo/	'grass'
(l) /t'/ : /s'/	/t'ammo/	'foot'
	/s'ammo/	'pure'

(m)	/l/	:	/r/	/s'iglo/	'elbow'
				/s'igro/	'star'
(n)	/n/	:	/m/	/šuuuno/	'work'
				/šuumo	'BISANA, in Amharica type of tree'

As can be seen from the chart, the phonemic pattern of stops is perfectly symmetrical as it has voiceless, voiced, ejective bilabial, alveolar, and velar counterparts.¹

But, while there are ten stops, almost half the consonant phonemes, there are only three fricatives. They are scattered unsystematically over three points of articulation (alveolar, alveopalatal and glottal) and two laryngeal states (voiceless and ejective). The rarity and asymmetry of fricatives, and consequently, the asymmetry of the obstruent class as a whole is probably due to diachronic changes. One reason for suspecting such changes is the presence of for example /f/ in Shinasha², a language closely related to Anfillo. It may be argued that /f/ is an innovation in Shinasha or a loss in Anfillo.

2.1.2 Consonant Length

Consonant and vowel length is binary and contrastive in this language. All consonants except /dz, ts', r, š, ʔ, h/ have long counterparts.

The following minimal and near minimal pairs demonstrate the contrast:

- | | | | |
|---------|---------------|------------|------------|
| (6) (a) | /p/ : /pp/ | /gipo/ | 'door' |
| | | /gippo/ | 'sew' |
| (b) | /b/ : /bb/ | /aabo/ | 'sun' |
| | | /dubbo/ | 'sing' |
| (c) | /p'/ : /p'p'/ | /daap'o/ | 'snake' |
| | | /k'ep'p'o/ | 'sit' |
| (d) | /t/ : /tt/ | /guto/ | 'mountain' |
| | | /gutto/ | 'two' |
| (e) | /d/ : /dd/ | /kudo/ | 'out' |
| | | /paddo/ | 'count' |
| (f) | /t'/ : /t't'/ | /gut'o/ | 'donkey' |
| | | /k'ut't'o | 'cut' |
| (g) | /g/ : /gg/ | /oogo/ | 'big' |
| | | /goggo/ | 'in' |
| (h) | /k'/ : /k'k'/ | /aak'o/ | 'black' |
| | | /ok'k'o/ | 'cold' |
| (i) | /ts/ : /tsts/ | /detso/ | 'dig' |
| | | /ketstso/ | 'chop' |
| (j) | /s'/ : /s's'/ | /mas'o/ | 'collect' |
| | | /mis's'o/ | 'laugh' |
| (k) | /m/ : /mm/ | /s'aamo/ | 'bile' |
| | | /s'ammo/ | 'pure' |
| (l) | /n/ : /nn/ | /gino/ | 'spear' |
| | | /t'unno/ | 'buttock' |

(m) /w/	:	/ww/	/dawitso/	'bear (local)'
			/dawwitso/	'weak'

Minimal or near minimal pairs for k/kk, y/yy, and l/ll are hard to find. The geminates (kk, yy, ll) are found as in (7) and the non-geminates as in (8) below. Moreover, the reason why geminate counterparts of /dz, ts, r, š, ʔ, h/ are not found is not clear.

(7)	(a)	/ikko/	'one'		
	(b)	/beyyo/	'live'		
	(c)	/tallo/	'mud'		
(8)	(a)	/kišo/	'hand'	/anka/	'how'
	(b)	/yakko/	'leave'		
	(c)	/labatse/	'dumb'	/balitsi/	'over'

Geminate and non-geminate contrasts are found only word medially as in (6) above. This will be discussed in chapter three.

2.1.3 Distinctive Features and Redundancy Rules

In this section, the distinctive features required for Anfillo consonants will be presented. First, the fully-specified feature matrix will be given and then the underspecified feature matrix will follow with the relevant redundancy rules³.

As shown in the following matrix, ten features are used for the consonants. The feature Vocalic [voc] distinguishes glides from all other consonants. The feature Sonorant [son] distinguishes sonorants from obstruents. The feature Nasal [nas] distinguishes nasals among the sonorants. The feature Lateral [lat] is used to distinguish the liquid /l/ from /r/. Distinctions between the nasals /m/ and /n/, as well as the glides /w/ and /y/ are made with the features of Anterior and coronal redundantly.

The feature Continuant [cnt] distinguishes fricatives from stops among the obstruents. The feature Voice [voi] separates voiced obstruents from voiceless ones. The feature Constricted Glottis (Constricted) [csr] distinguishes ejective obstruents from the voiceless ones. It also distinguishes /ʔ/ from /h/. Constricted sounds as defined in Katamba (1989:48) are sounds that are produced with a severe obstruction of the glottis which is made using the vocal cords. This inhibits or prevents the free vibration of the vocal cords.

	voc	son	nas	lat	cnt	voi	csr	ant	cor	low
p	-	-	-	-	-	-	-	+	-	-
b	-	-	-	-	-	+	-	+	-	-
p'	-	-	-	-	-	-	+	+	-	-
t	-	-	-	-	-	-	-	+	+	-
d	-	-	-	-	-	+	-	+	+	-
t'	-	-	-	-	-	-	+	+	+	-
k	-	-	-	-	-	-	-	-	-	-
g	-	-	-	-	-	+	-	-	-	-
k'	-	-	-	-	-	-	+	-	-	-
s	-	-	-	-	+	-	-	+	+	-
z	-	-	-	-	+	+	-	+	+	-
s'	-	-	-	-	+	-	+	+	+	-
š	-	-	-	-	+	-	-	-	+	-
h	-	-	-	-	+	-	-	-	-	+
ʔ	-	-	-	-	-	-	+	-	-	+
l	-	+	-	+	+	+	-	+	+	-
r	-	+	-	-	+	+	-	+	+	-
m	-	+	+	-	-	+	-	+	-	-
n	-	+	+	-	-	+	-	+	+	-
w	+	+	-	-	+	+	-	+	-	-
y	+	+	-	-	+	+	-	-	-	-

Chart 2 The Fully-Specified Feature Matrix for Consonants

The remaining features, Anterior, Coronal and Low concern the point of articulation of the consonants, particularly obstruents. The combination of Anterior [ant]

and Coronal [cor] distinguishes labials as [+ant, -cor], alveolars as [+ant, +cor], alveopalatal and palatal as [-ant, +cor], velars as [-ant, -cor]. The feature Low [low] distinguishes the glottals /ʔ/ and /h/ from the rest of the obstruents and consonants in general.

It will be apparent in the following discussions that most of these features are also needed in statements of phonotactic restrictions and phonological rules.

As can be seen in the above matrix, much of the information is redundant. Hence, based on the feature minimization principle, the matrix is modified (see chart 3) to include the bare minimum of information. The unspecified feature values can be filled in by Redundancy Rules, both the Default Rules and Complement Rules as in (9) and (10) below:

(9) Default Rules

[] —> [-voc] / [$\overline{+csr}$]
 [] —> [-son] / [$\overline{+csr}$]
 [] —> [+son] / [$\overline{+voc}$]
 [] —> [-nas] / [$\overline{+lat}$]
 [] —> [-nas] / [$\overline{+low}$]
 [] —> [-lat] / [$\overline{+voc}$]
 [] —> [-lat] / [$\overline{+nas}$]

(Default Rules contd.)

[] \longrightarrow [+cnt] / [$\overline{+voc}$]
 [] \longrightarrow [-cnt] / [$\overline{+nas}$]
 [] \longrightarrow [+cnt] / [$\overline{+lat}$]
 [] \longrightarrow [+voi] / [$\overline{+voc}$]
 [] \longrightarrow [+voi] / [$\overline{+son}$]
 [] \longrightarrow [-voi] / [$\overline{+csr}$]
 [] \longrightarrow [-voi] / [$\overline{+low}$]
 [] \longrightarrow [-csr] / [$\overline{+son}$]
 [] \longrightarrow [+ant] / [$\overline{+nas}$]
 [] \longrightarrow [-ant] / [$\overline{+low}$]
 [] \longrightarrow [-cor] / [$\overline{+low}$]
 [] \longrightarrow [-low] / [$\overline{+ant}$]
 [] \longrightarrow [-low] / [$\overline{-cor}$]
 [] \longrightarrow [-low] / [$\overline{+son}$]
 [] \longrightarrow [-low] / [$\overline{+voc}$]

(10) Complement Rules

[] \longrightarrow [-voc]
 [] \longrightarrow [-son]
 [] \longrightarrow [-nas]
 [] \longrightarrow [-lat]
 [] \longrightarrow [+cnt]
 [] \longrightarrow [+voi]
 [] \longrightarrow [-voi]

(Complement Rules cntd.)

[] —> [-csr]

[] —> [+ant]

[] —> [-ant]

[] —> [+cor]

[] —> [-low]

	voc	son	nas	lat	cnt	voi	csr	ant	cor	low
p					-			+	-	
b					-	+		+	-	
p'					-		+	+	-	
t					-			+		
d					-	+		+		
t'					-		+	+		
k					-				-	
g					-	+			-	
k'					-		+		-	
s								+		
z						+		+		
s'							+	+		
ʃ										
h										+
ʔ					-		+			+
l		+		+						
r		+								
m		+	+						-	
n		+	+							
w	+								-	
y	+									

Chart 3: The Underspecified Feature Matrix for Consonants

2.2.2 Vowel Length

As indicated previously, vowel length, like consonant length, is binary and distinctive. All of the short vowels are found to have long counterparts.

The following minimal and near minimal pairs demonstrate the contrast between the short and long vowels:

- | | | | |
|----------|------------|----------|------------|
| (12) (a) | /i/ : /ii/ | /diho/ | 'fall' |
| | | /diiho/ | 'night' |
| (b) | /e/ : /ee/ | /detso/ | 'dig' |
| | | /keetso/ | 'house' |
| (c) | /u/ : /uu/ | /guto/ | 'mountain' |
| | | /guuto/ | 'dirt' |
| (d) | /o/ : /oo/ | /ok'k'o/ | 'cold' |
| | | /oogo/ | 'big' |
| (e) | /a/ : /aa/ | /ašo/ | 'person' |
| | | /aapo/ | 'eye' |

Unlike the short and long consonant contrasts found only word medially, short and long contrasts of vowels are found word initially (12d,e) and medially (12a,b,c,). Eventhough, such contrasts are not found word finally, and before clusters or geminates. This will be discussed in chapter three.

2.1.3 Distinctive Features and Redundancy Rules

In this section, the fully-specified and the underspecified feature matrices of vowels will be given with redundancy rules.

The distinctive features used for vowels are Back, Round, and High. The feature Back [bak] distinguishes back vowels (a,o,u) from the front vowels (i,e). The feature Round [rnd] distinguishes back rounded vowels (o,u) from back unrounded one (a). The feature High [hig] distinguishes the front high vowel (i) from the front mid one (e), and the back rounded high vowel (u) from the back rounded mid one (o) as in the matrix below:

	bak	rnd	hig
i	-	-	+
e	-	-	-
a	+	-	-
o	+	+	-
u	+	+	+

Chart 5. The Fully-Specified Feature Matrix for Vowels

The redundancy rules for vowels are shown in (13) and (14) below:

(13) Default Rules

$$[\quad] \longrightarrow [+bak] / [\overline{+rnd}]$$

$$[\quad] \longrightarrow [-rnd] / [\overline{-bak}]$$
(14) Complement Rules

$$[\quad] \longrightarrow [+bak]$$

$$[\quad] \longrightarrow [-rnd]$$

$$[\quad] \longrightarrow [+high]$$

	bak	rnd	high
i	-		
e	-		-
a			-
o		+	-
u		+	

Chart 6 The Underspecified Feature Matrix for Vowels

Notes to Chapter Two

1. The non-existence or gap of voiced and ejective glottal stops in the pattern is predictable because they are physiologically impossible sounds.
2. See: Gebre (1986a) and Ashenafi (1989).
3. The feature matrices do not define the affricates. Instead, they define the stops (t and d) and the fricatives (s, z, and s') that compose the affricates. This follows from the autosegmental representation of the affricates in terms of two segments, a stop and a fricative, on the segmental or phonemic tier.

CHAPTER THREE

3. SYLLABLE STRUCTURE: SEGMENTAL DISTRIBUTION, CO-OCCURRENCE, AND PHONOLOGICAL PROCESSES

In this chapter, the syllable structure, the distribution and co-occurrence of the segments, and the phonological processes of the language will be described.

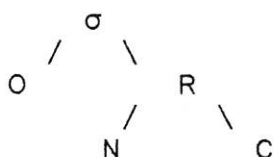
3.1 Syllable Structure

In this section, the syllable structure template, the syllable types and their distributions will be described.

3.1.1 Syllable structure Template

Syllable is a phonological unit which has internal structures of its own (Goldsmith 1990:109) as in (15) below. The Syllable (σ) consists of the Onset (O) and the rhyme (R) and the rhyme in turn consists of the nucleus^(N) and the coda (C).

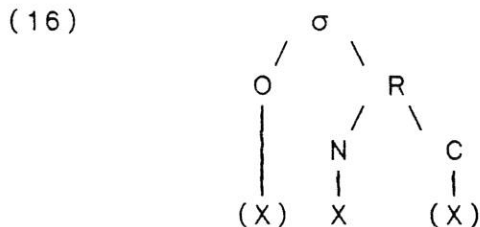
(15)



The syllable structure is organized on the skeletal tier (Goldsmith 1990:109) and the number of associations between the syllable positions (O,N,C) and the skeletal

tier units depend upon both universal and language-particular restrictions. Universally, the nucleus is a single obligatory syllable position; i.e. it associates with a single skeletal unit of a vowel (or a syllabic consonant in rare cases). The onset and the coda are optional and may also associate with zero or more skeletal unit(s) depending upon language-particular restrictions. The onset may associate with zero or more skeletal units of a consonant and the coda may associate with zero or more skeletal units of a consonant or a long vowel (the second member of the skeletal slots (halves) representing a long vowel in the skeletal tier).

In Anfillo, the nucleus always associates with a skeletal unit of a vowel, the onset may optionally associate with a single skeletal unit of a consonant, and the coda may also optionally associate with a single skeletal unit of a consonant or with the second member of the skeletal slots representing a long vowel.¹ We can schematize the syllable structure template of Anfillo as in (16) below:

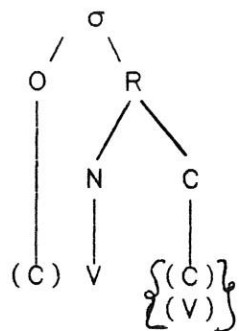


Whether any X in the skeletal tier represents a vowel or a consonant can be expressed by the syllable positions

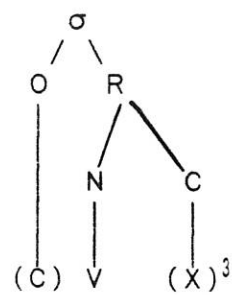
and the segmental tier unit with which it associates. The first X in the onset represents a consonant; the second X in the nucleus represents a vowel; and the third X in the coda represents a consonant if associated with a consonant in the segmental tier or a vowel if associated with a vowel in the segmental tier. In other words, there is no need of symbolizing the skeletal units as Cs (consonants) and Vs (vowels) since this is predictable from the autosegmental representation.²

However, for descriptive convenience, we shall make use of Cs and Vs in place of Xs, and sometimes X itself with C and V. Hence, the syllable structure template in (16) can be restated as in (17a) or (17b) below:

(17) (a)



(b)



3.1.2 Syllable Types

As it is apparent from the syllable structure template above, Anfillo⁴ has the following syllable types:

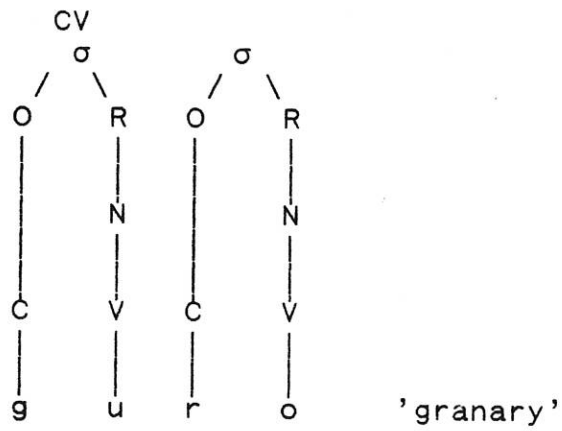
(18) (a) CV

(b) V

- (c) CVX (i) CVC
(ii) CVV
(d) VX (i) VC
(ii) VV

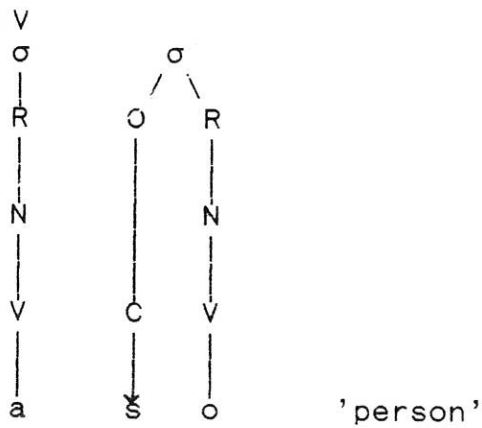
Examples are given below for each of the syllable types shown above.

(19)



'granary'

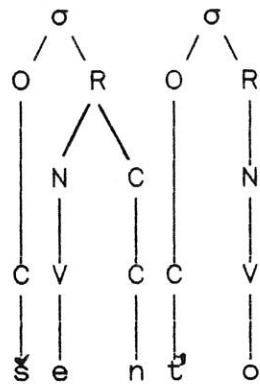
(20)



'person'

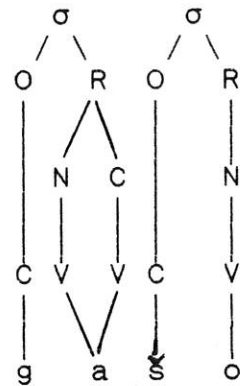
(21) CVX

(a) CVC



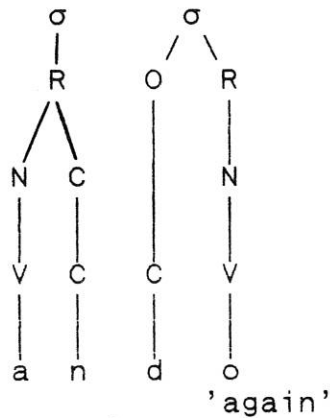
'monkey'

(b) CVV

'TEF, a type
of crop,

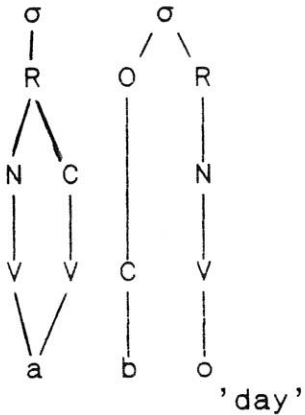
(22) VX

(a) VC



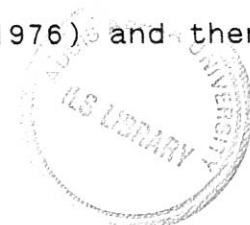
'again'

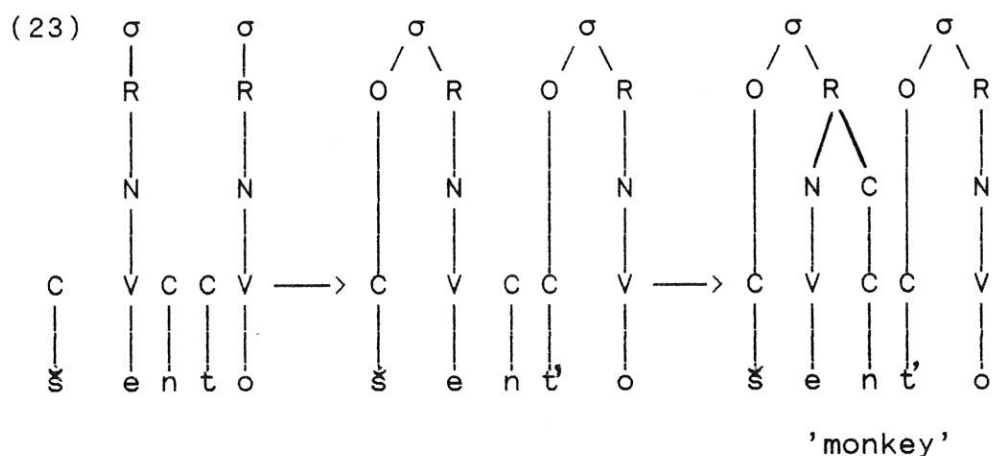
(b) VV



'day'

In the syllabification, we follow the 'all nuclei first approach' (Goldsmith 1990:117), according to which the syllable head, that is, the nucleus, is underlyingly specified or associated, and hence, an obligatory element. The next step is to co-syllabify the onset following the Onset First Principle (OFP) of Kahn (1976) and then the coda as in the following:





The parallel structure of a long vowel (VV) and a sequence of a vowel and a consonant (VC) in the syllable as in (18c) and (18d) or (21a) and (22b) above reflects the universal restriction that the nucleus is a single obligatory position, the coda being the rest of the rhyme to the right of the nucleus position (Goldsmith 1990:109), and hence, 'branching rhyme' is chosen than 'branching nucleus' in the analysis (Goldsmith 1990:114).

In Anfillo, CV syllable is the most frequent and preferred syllable type as will be evident from the phonological processes.

3.1.2.1 Closed and Open Syllables

Closed syllables are syllables that end in a consonant. The following are examples of such syllables:

- (24) (a) CVC : šarpo 'breakfast' gotto 'road'
 (b) VC : ando 'again' ikko 'one'

Open syllables end in a vowel. The following are examples of this type:

- (25) (a) CV : pi ro 'worm'
 (b) V : ašo 'person'
 (c) CVV : šaamo 'bile'
 (d) VV : aabo 'day'

As in the examples of closed syllables given above, only sonorant consonants and first members of geminate halves are found in the coda. This phenomenon is accounted for by the principle of autosegmental licensing (Goldsmith 1990). The primary licensor which is the syllable node, licenses all distinctive feature contrasts in the onset - nucleus span. But the secondary licensor; that is, the coda, licenses the subset of the feature contrasts licensed by the primary licensor. This means there can be some feature contrasts that are not licensed by the coda. It appears that in this language, the coda does not license contrastive point of articulation (P of A) or consonants that are underlyingly specified for this feature. In other words, contrastive P of A is not licensed in the coda. Sonorant consonants and first members of geminate halves are found in the coda because they are not underlyingly specified for P of A. In connection to this, Goldsmith (1990:125) says that consonants that appear in the coda will either be homorganic to a following consonant; i.e. they will share the P of A of the following consonant in

the onset or they will have a non-distinctive default P of A. This is attested in this language.⁵

3.1.3 Syllable Distribution

Word initially, all syllable types given above are found; word medially, CV and CVX (both CVC and CVV) and word finally, CV and CVX (only CVC) are found as shown in the following chart and in the examples that follow.

		Word Positions		
		WI	WM	WF
Syllable Types	CV	X	X	X
	V	X		
	CVX, CVC CVV	X X	X X	X
	VX, VC VV	X X		

Chart 7. Syllable Distribution in the World

Word Initial

(26) CV : guro 'granary'

(27) V : ašo 'person'

(28) CVX :

(a) CVC : šent'o 'monkey'

(b) CVV : šaamo 'bile'

(29) VX

(a) VC : ando 'again'

(b) VV : aabo 'day'

Word Medial

(30) CV : dupino 'corpse'

(31) CVX

(a) CVC : bik'albo 'conduct'

(b) CVV : his'aawo 'salt'

Word Final

(32) CV : kišo 'hand'

(33) CVC: s'unt'em 'little (f)'

The occurrence of consonant initial syllables word medially and finally, and the non-occurrence of vowel initial syllables word medially and finally reflects or obviates that in this language word medial onset is obligatory.

The non-occurrence of CVV word finally results from the non-occurrence of long vowels word finally. The CVC syllable is found word finally as a result of affixation only. It is not found in tautomorphic words. The non-occurrence of long vowels or consonants in tautomorphic words word finally will be treated and explained later.

3.2. Distribution and Cooccurrence of the Segments

In this section, the distribution and co-occurrence of segments will be described and analyzed.

3.2.1 Distribution

Word initially, geminates, affricates and [p', r, ʔ, ii, and uu] are not found. But the rest of the segments are found as in the following examples:

(34)	[p]	[piro]	'worm'
	[b]	[boono]	'dough'
	[t]	[tallo]	'mud'
	[d]	[daap'o]	'snake'
	[t']	[t'uuno]	'buttock'
	[k]	[keetso]	'house'
	[g]	[gʉur ^h o]	'mountain'
	[k']	[k'aro]	'horn'
	[s']	[s'aamo]	'bile'
	[ʃ]	[ʃaho]	'flower'
	[h]	[hani]	'this'
	[m]	[maʃo]	'grass'
	[n]	[noono]	'mouth'
	[l]	[labatse]	'dumb'
	[w]	[waggo]	'year'
	[y]	[yongo]	'wind'
	[i]	[ikko]	'one'

[e]	[ebba]	'that'
[a]	[ats'o]	'sharp'
[o]	[ok'k'o]	'cold'
[u]	[utso]	'drink'
[ee]	[eepo]	'cry'
[aa]	[aabo]	'sun'
[oo]	[oogo]	'big'

Word medially, all types of segments are found as in the geminate/non-geminate contrasts in 2.1.2 and the following examples for vowels and consonants which have no geminate counterparts.

(35)	[š]	[maašo]	'grass'
	[dz]	[keedzo]	'three'
	[ts']	[ats'o]	'sharp'
	[s]	[kanso]	'oak'
	[z]	[minzo]	'cow'
	[s']	[s'uns'o]	'saliva'
	[h]	[šaho]	'flower'
	[ʔ]	[naʔp]	'baby'
	[r]	[k'aro]	'horn'
	[i]	[diho]	'fall'
	[e]	[detso]	'dig'
	[a]	[garo]	'bad'
	[o]	[goggo]	'in'
	[u]	[s'uns'o]	'saliva'

[ii]	[diiho]	'night'
[ee]	[keetso]	'three'
[aa]	[gaaro]	'wet'
[oo]	[googo]	'locust'
[uu]	[guur ^h o]	'dirt'

Word finally, [o,i,e,a,m,n,r] are found.
 [i,e,a,m,n,r] are found as or as part of some suffixes.
 Otherwise, only [o] is found.

(36)	[m]	[bargetsem]	'beauty (f)'
	[n]	[šatton]	'coward'
	[r]	[kand+r]	'urinate (pl.imp.)'
	[i]	[nuuši]	'we'
	[e]	[konne]	'who'
	[a]	[k'ep'p'a]	'sit (3 sg.juss.)'
	[o]	[oogo]	'big'

3.2.2 Co-occurrence

Vowel co-occurrence as V_1V_2 is not found.

Consonants co-occur only word medially. The number of consonants in a cluster is only two and the first member is always a sonorant as in the following:

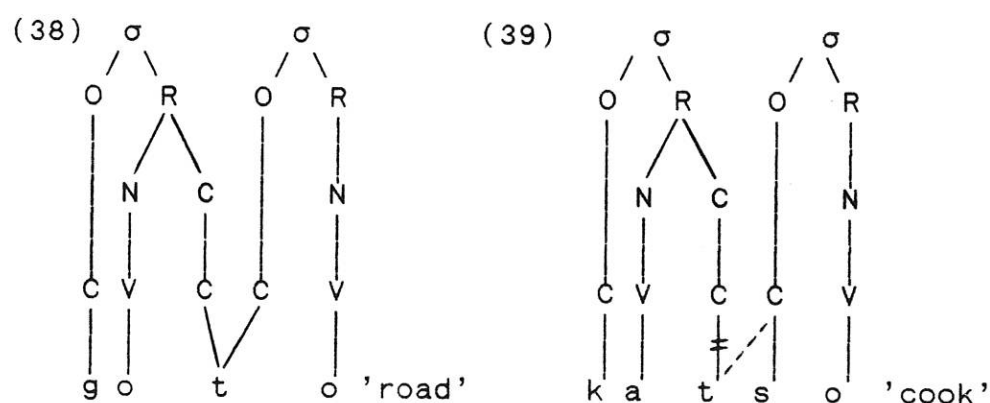
(37)	[nt]	[intaaši]	'you (pl.)'
	[nd]	[ando]	'again'

[nt']	[šent'o]	'monkey'
[ŋk]	[aŋka]	'how'
[ŋg]	[yonggo]	'wind'
[ŋk']	[goŋk'o]	'skin'
[ns]	[kanso]	'oak'
[nz]	[minzo]	'cow'
[ns']	[s'uns'o]	'saliva'
[mb]	[dombo]	'vagina'
[lp]	[k'ulpo]	'button'
[lb]	[bik'albo]	'conduct'
[lt]	[elto]	'DESERT STICK'
[rp]	[šarpo]	'breakfast'
[rb]	[himarbeero]	'select'
[rt]	[berta]	'forger(sg.m.'juss)'
[rt']	[murt'ut't'o]	'throwing stick'
[rg]	[bargetso]	'beauty'
[rs]	[paršo]	'horse'
[rm]	[gurmatto]	'knee'

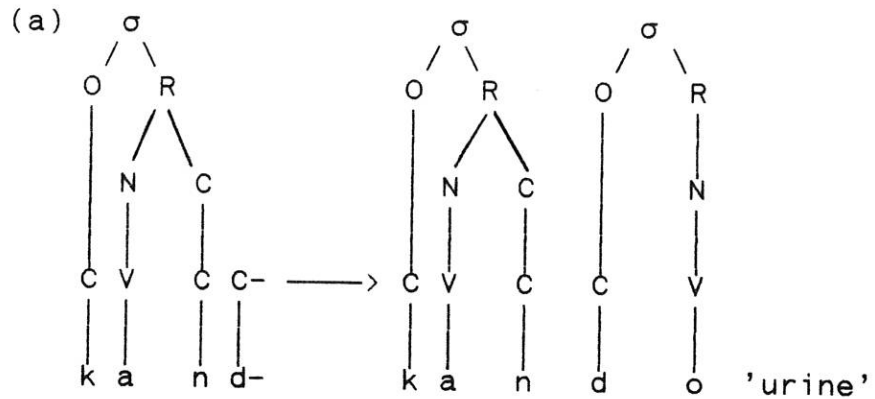
Long vowels are not found preceding consonant clusters and geminates.

The distributional and co-occurrence restriction of some segments can get a straightforward explanation in a syllable - based autosegmental analysis. Geminates and affricates that are underlyingly represented in terms of two skeletal slots are not found word initially⁶ since the onset does not branch as it allows association with a

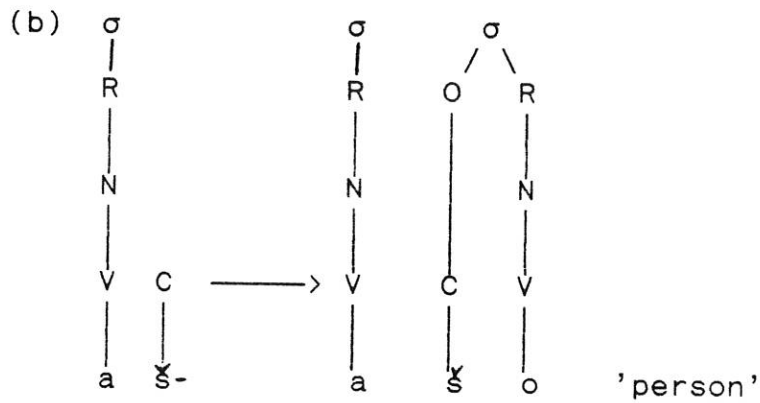
single skeletal slot of a consonant only. Geminates and affricates are found word medially since they can be in the coda and onset of two adjacent syllables as in (38) and (39) below.⁷ In (39), the delinking and reassociation of the first member of the affricate can be accounted for in terms of coda licensing.



The gross restriction of consonants and vowels word finally except [o]⁸ is because roots or stems of Anfillo are realized always with a characteristic final vowel [o]. The exclusive occurrence of [o] root finally may mean that this vowel has no participation or significance in the distinction of root meaning. The final [o] is not a part of the underlying representation of roots. Its occurrence can be accounted for in terms of a syllable-based analysis as a means of creating licensing environment for root-final consonants which could not be licensed and hence realized otherwise. For example:

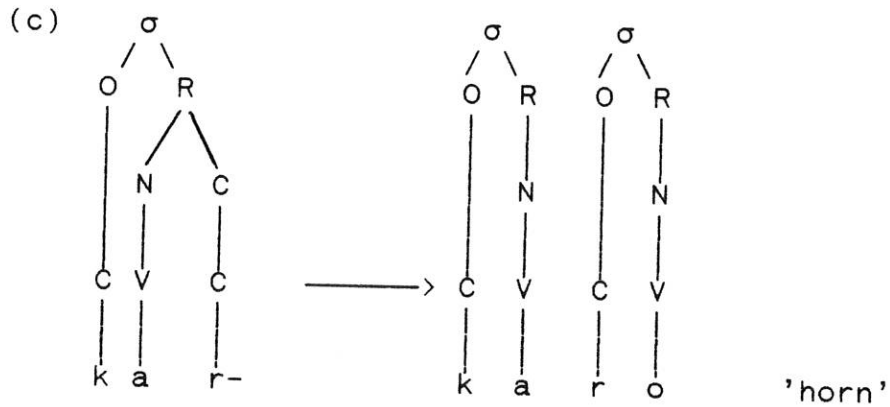
(40) UnderlyingSurface

Root-final /d/ could not be realized without a following vowel [o] because the syllable structure template of the language does not allow clustering of consonants in a syllable.



Root-final /s/ could not be realized without [o] because obstruents are not licensed in the coda.





But here, the root-final /r/ could also be realized without [o] in the coda of the first syllable since it is a sonorant.⁹

The non-existence of V_1V_2 follows from the word medial obligatory onset. In a language like Anfillo where word medial onset is obligatory two syllable heads cannot co-occur without an intervening onset.

Cluster of consonants are only word medial because clustering in a syllable onset or coda is not allowed. The word medial cluster of two consonants arise as a result of the consonants in the coda and onset of two adjacent syllables. The fact that the first member of the cluster of consonants is a sonorant can then be predicted from licensing. Consonants that are licensed in the coda are either sonorants or first members of geminate halves.¹⁰

The non-occurrence of long vowels preceding clusters of consonants or geminates follows from universal and language-particular restrictions of syllable structure.

The nucleus is universally a single obligatory position. The coda in this language associates (optionally) with a single skeletal slot. If there is a cluster (C_1C_2) or a geminate (C_1C_1) in the word, the first member is in the coda position. What we predict preceding that coda is then a short vowel in the single obligatory nucleus position. Hence, a long vowel which needs the whole rhyme, both the nucleus and the coda positions, cannot be predicated to be found preceding a cluster or a geminate.¹¹

3.3 Phonological Processes

In this section, the phonological processes of the language will be described.

3.3.1 Vowel Nasalization

A vowel is nasalized in ~~the~~ three seemingly different environments:

(i) preceding a nasal-obstruent cluster,

- (41)¹² (a) /dombo/ ———> [dõmbo] 'vagina'
 /ando/ ———> [ãndo] 'again'

(ii) preceding a geminate nasal,

- (42) (a) /k'immo/ ———> [k'ĩmmo] 'dirt'
 (b) /t'unno/ ———> [t'ũnno] 'buttock'

(iii) preceding a word final nasal,

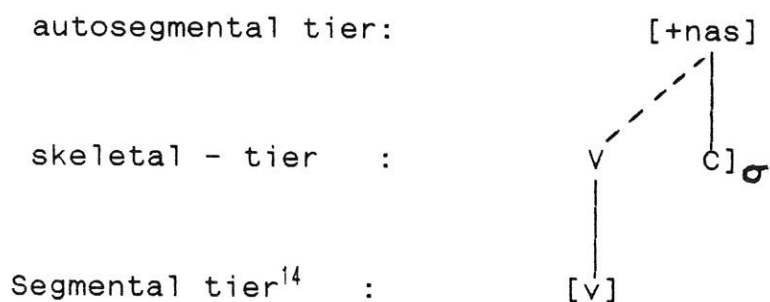
- (43) (a) /bargetsem/ ———> [bargetsẽm] 'beauty (f.)'

(b) /šatton/ → [šattõn] 'coward'

In a segment-based analysis such as in SPE reference to these three environments of vowel nasalization is a must. But in a syllable-based analysis a single generalization can be found; that is, a vowel is nasalized before a nasal consonant in closed syllables. A nasal in a nasal-obstruent cluster or in a geminated nasal cluster or in a word final position is in a closed syllable as a syllable coda.

The generalization above can be expressed by the following autosegmental rule as spreading¹³ of a nasal feature in a closed syllable from the autosegmental tier to the V-slot preceding a nasal.

(44) Vowel Nasalization Rule



A vowel is not nasalized however in open syllables eventhough it occurs preceding a nasal consonant as in [šano] 'light' or [himarbeero] 'select',¹⁵

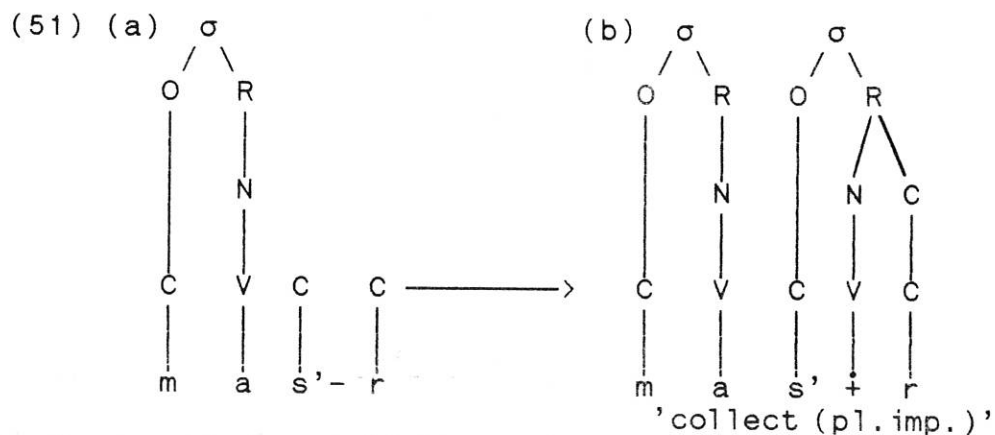
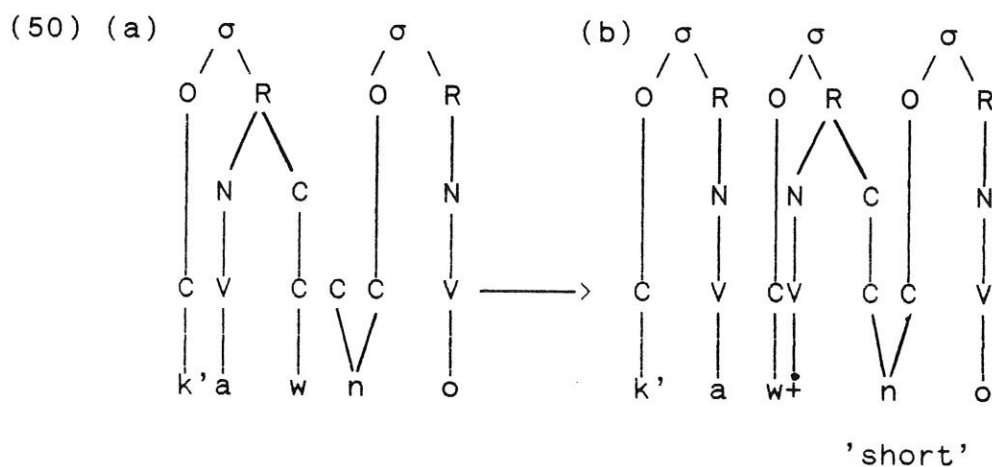
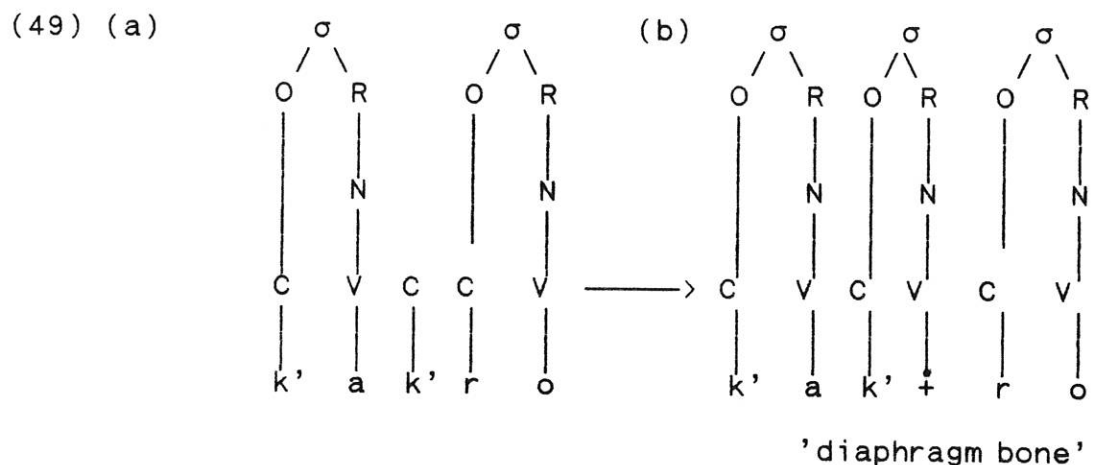
3.3.2 Epenthesis

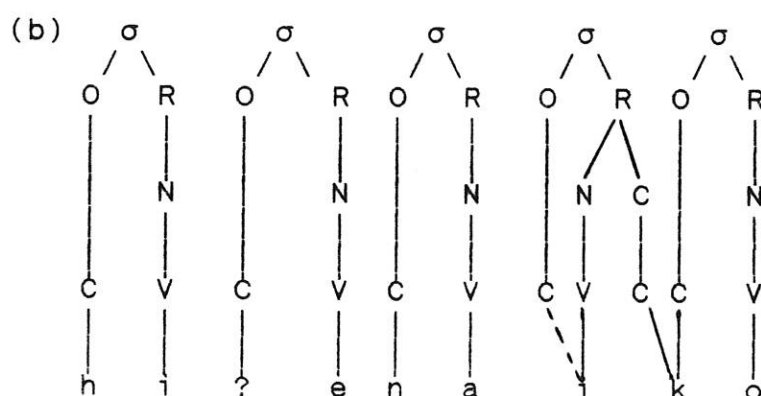
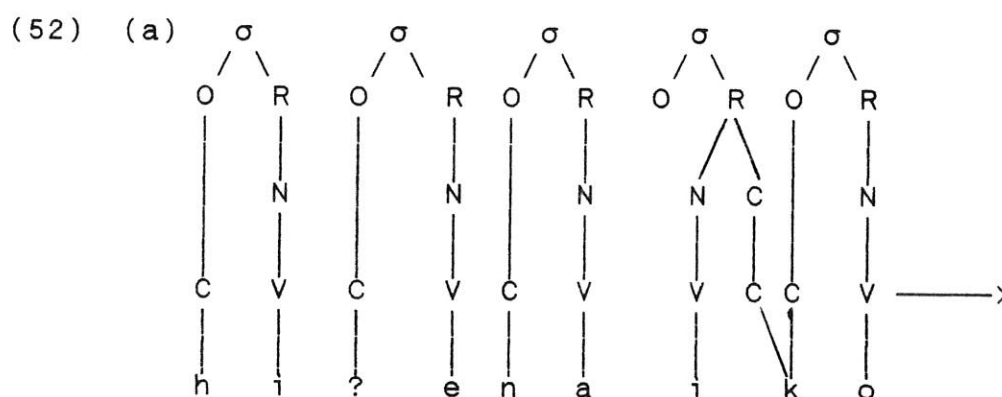
Vowel Epenthesis

An epenthetic vowel [ɨ] is inserted between consonant clusters of the following three sorts:

- (i) between a word medial cluster of velar and liquid consonants,
- (45) (a) /k'ak'ro/ → [k'ak'ɨro] 'diaphragm bone'
 (b) /bak'lo/ → [bak'ɨlo] 'mule'
 (c) /makro/ → [makɨro] 'acknowledge'
 (d) /s'iglo/ → [s'igɨlo] 'star'
 (e) /s'igro/ → [s'igɨro] 'elbow'
- (ii) between a word medial cluster of sonorant and geminate consonants,
- (46) (a) /k'awnno/ → [k'awɨnno] 'short'
 (b) /awddo/ → [awɨddo] 'four'
 (c) /yirbbo/ → [yirɨbbo] 'thread'
- (iii) between a word final cluster of two or three consonants,
- (47) (a) /mas'-r/ → [mas'ɨr] 'collect (pl.imp)'
 'collect-suff.'
 (b) /kaar-r/ → [kaarɨr] 'fight (pl.imp)'
 (c) /yong-r/ → [yongɨr] 'blow (pl.imp)'
 (d) /kand-r/ → [kandɨr] 'urinate(pl.imp)'

Examine the following syllabified forms before and after epenthesis:





(c) [hi?enayikko] 'twentyone'
(phonetic form)

In (49a), the velar would violate the coda licensing if syllabified in the coda of the first syllable. The coda, in Anfillo, does not license contrastive P of A. It licenses a sonorant or the first member of the geminate halves. The velar as an obstruent is underlyingly specified for P of A. It can be licensed only by the primary licenser to appear in the onset. On the other hand, if we syllabify the velar in the onset of the second syllable, it would violate the syllable structure template. In this language, neither the onset nor the coda branches. Epenthesis is therefore applied, followed by the creation of

a primary licenser and the resyllabification of the velar in the onset of the new syllable as in (49b).

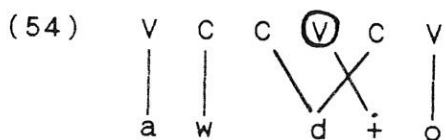
In (50a), the syllabification of the first member of the geminate halves either in the coda or in the onset position of the two adjacent syllables would violate the syllable structure template. Both the onset and the coda positions are occupied and they can not branch to associate with the unsyllabified element. Hence, epenthesis is applied and a coda position is created where the initial member of the geminate halves is licensed to be associated or syllabified. In (50b), the consonant [w] that was in the coda of the first syllable is resyllabified in the onset of the following syllable. This follows from the Onset First Principle of Syllabification.

In (51a), the word final cluster violates mainly the syllable structure template. The consonants in the cluster cannot be syllabified in the coda since the coda allows only a single association. The epenthetic vowel is inserted between the clusters as in (51b) and the violation is avoided. The insertion of [ɪ] is always preceding the final consonant in the clusters of either two or three members. Otherwise, one would make wrong predictions. For example, if we say [ɪ] is inserted after the first member in a cluster, words with the three consonant cluster would still remain with unsyllabified final cluster of two consonants as in the following:

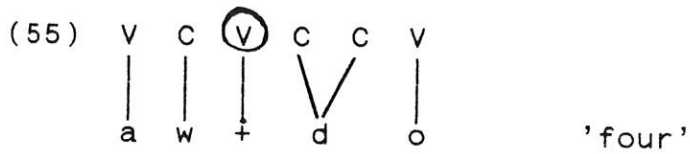
- (53) /yong-r/ \longrightarrow *[yonɪgr] 'blow (pl.imp.)'
 ([g], as an obstruent, cannot be syllabified in the coda. The underlining indicates possible syllabification)

The statement that a vowel is inserted preceding the final consonant in a cluster is also in agreement with the other sub-domain of vowel epenthesis (49) above, except the insertion in (50) where it is applied preceding two consonant slots of the geminate. But still this exception can be accounted for by the integrity property of geminates (Goldsmith 1990:49) which refers to the resistance displayed by the halves of geminates from being separated by rules of vowel epenthesis.

The integrity property of geminates can be reflected from and explained by crossing association lines that results from the insertion of a vowel between the geminate halves as in the following:



Hence, the insertion applies before the geminate halves to give a well-formed association as below:¹⁸



In (52a), the word medial sequence of vowels violates the word medial obligatory onset. We stated in the previous section that in this language, a syllable without onset is not allowed word medially. In the structure (52a) a word medial onset is left hanging or unassociated. In (52b) that onset node gets a glide as an associate. The spreading from the vowel in the segmental tier to the newly inserted C in the skeletal tier accounts for the quality of the glide. The quality of the inserted glide depends on the quality of the vowel to the right.

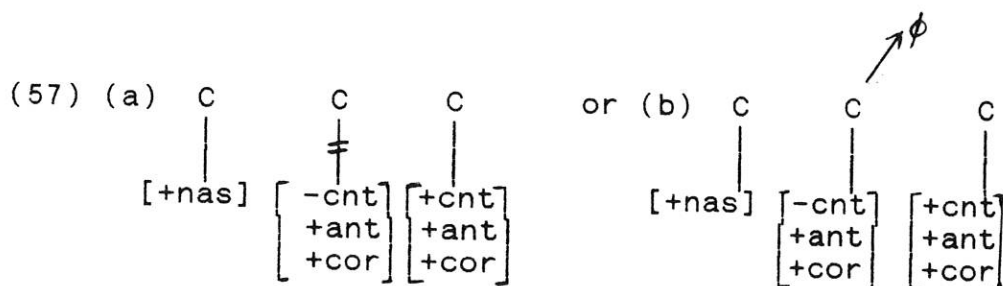
The generalization for epenthesis is that epenthesis is applied in the phonological contexts which cannot be properly syllabified as they stand (Goldsmith 1990:113).¹⁹

3.3.3 Affricate Fricativization (Deletion)

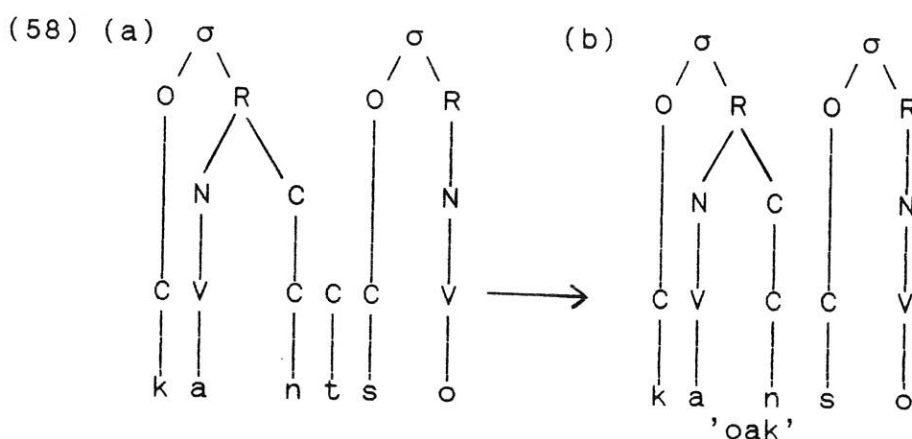
As in (56) below affricates are spirantized or get fricativized following a nasal consonant.

- (56) (a) /kantsol/ —> [kanso] 'oak'
 (b) /bondzo/ —> [bonzo] 'calf'
 (c) /s'unts'o/ —> [s'uns'o] 'saliva'

Affricates are underlyingly represented in terms of two skeletal units on the skeletal tier and two segmental units on the segmental tier as a cluster of a stop and a fricative. Hence, the process can be analyzed autosegmentally as a process of deletion or delinking that deletes the first member of the affricate. This can be expressed by the following rule:



This is more straightforward in (58) below where we have syllabified forms before and after deletion.



This deletion process appears to be accounted for by the same generalization given for epenthesis, as a process applies in the phonological context that cannot be properly syllabified. As in (58a), the deleted element violates the syllable structure template; it cannot be syllabified as it

stands either in the coda or in the onset position of the adjacent syllables. But this generalization does not work for the other case of deletion that will be dealt with in the following subsection.

3.3.4 Intervocalic Weakening

Intervocalic weakening is of two types in Anfillo. One is the weakening of certain non-geminate stops in intervocalic positions (henceforth, Intervocalic Weakening Process 1 (IWP1)). The other is the weakening of certain geminates and the affricate (/ts/) intervocalically in imperative and jussive forms of words (henceforth, Intervocalic Weakening Process 2 (IWP2)).

IWP 1

/p/, /b/, /t/, and /t'/ weaken to [p̥], [b̥], [r^h], and [r^ʔ], respectively, intervocalically as in the following examples:

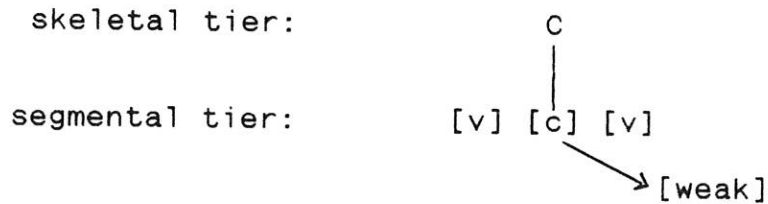
- (59)²⁰
- | | | | | |
|-----|-----------|---|----------------------|------------|
| (a) | /daapo/ | → | [daap̥o] | 'surprise' |
| (b) | /lebatse/ | → | [lebat̥se] | 'dumb' |
| (c) | /guto/ | → | [gur ^h o] | 'mountain' |
| (d) | /gut'o/ | → | [gur ^ʔ o] | 'donkey' |

This process does not affect the geminate counterparts of the above non-geminate stops in the same environment as shown in (60) below:

- (60) (a) /šippo/ —————> [šippo] 'sew'
 (b) /dubbo/ —————> [dubbo] 'sing'
 (c) /šatto/ —————> [šatto] 'fear (to be
 afraid)'
 (d) /k'ut't'o/ —————> [k'ut't'o] 'cut' (verb
 stems)
 (e) /#tibbo/ —————> [tibbo/ 'bat'
 (f) /gotto/ —————> [gotto] 'road'
 (g) /murt'ut't'o/ —————> [murt'ut't'o]
 'throwing stick'
 (non-verb stems)

Such a phenomenon is accounted for in the literature by the Inalterability Property of geminates (Schein 1981; Kenstowicz. 1982; Steriade 1982; Schein and Steriade 1986; Goldsmith 1990). The term inalterability, as in Goldsmith (1990:49), refers to the resistance displayed by the halves of geminates to phonological rules that might affect only half of them.

The following phonological rule, Intervocalic Weakening Rule 1 (IWR1), shows that a segmental unit [c] is weakened if it is associated with a single skeletal unit. If this structural description is not met, for example, if it is associated with two skeletal slots the rule is blocked from applying.

(61) IWR1IWP 2

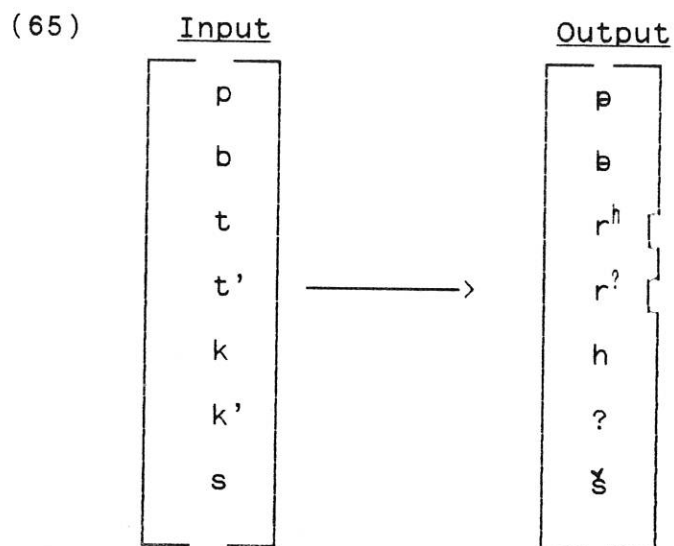
Root final geminates /pp,bb,tt,t't',kk,k'k'/ and affricate/ts/ are weakened respectively to [p̥,b̥,rʰ,rʰʔ,h,ʔ,ʃ] intervocally in the imperative and jussive forms of verbs.

(62) ²¹	<u>verb root</u>	<u>gloss</u>	<u>sg.imp.</u>	<u>pl.imp.</u>	<u>3sg.juss.</u>
	/šipp-/	'sew'	[šip̥j]	[šip̥t̥r̥]	[šip̥en̥a] (f.) [šip̥a] (m.)
	/dubb-/	'sing'	[dub̥j]	[dub̥t̥r̥]	[dub̥en̥a] (f.) [dub̥a] (m.)
	/šatt-/	'fear'	[šarʰj]	[šarʰt̥r̥]	[šarʰen̥a] (f.) [šarʰa] (m.)
	/k'ut't'-/	'cut'	[k'urʰj]	[k'urʰt̥r̥]	[k'urʰen̥a] (f.) [k'urʰa] (m.)
	/yakk-/	'leave'	[yahj]	[yah̥t̥r̥]	[yah̥en̥a] (f.) [yah̥a] (m.)
	/dek'k'-/	'take'	[deʔj]	[deʔt̥r̥]	[deʔen̥a] (f.) [deʔa] (m.)
	/buts-/	'kick'	[buš̥j]	[buš̥t̥r̥]	[buš̥en̥a] (f.) [buš̥a] (m.)

The weakening of the geminates and the affricate above is analyzed as an outcome of two rules applying on different tiers. One is a deletion rule applying on the skeletal tier deleting one of the skeletal units representing a geminate or an affricate in the coda (henceforth, Coda Deletion). The other is a weakening

other intervocalic affricate in the onset. The outcome of the coda deletion as is obvious from the data in (62), is a preferred CV type of syllable. For example, in /šippi/ → [šipi] 'sew (sg. imp.)', underlying CVC CV sequence becomes CV CV after coda deletion.

The pattern of the input and the output of intervocalic weakening rules as in the examples (59) and (62), or in general as in (65) below, is asymmetrical. In other words, the modification of intervocalic consonants though natural is irregular when we see how each consonant is modified.



When the bilabial stops are changed to bilabial fricatives, one would expect also that the alveolar and the velar stops would be changed to alveolar and velar fricatives. However, this is not so.

An explanation for such irregularities will be given below where we deal with palatalization and where a similar instance of irregularity is also found.

3.3.5 Palatalization

Consonants are palatalized preceding front vowels ²⁴. However, as shown in (66) and (67) below, velars and non-velars behave differently. When non-velars add only a secondary place of palatal articulation without changing their primary point of articulation, velars change their primary point of articulation to become palatals.

(66) Non-velars

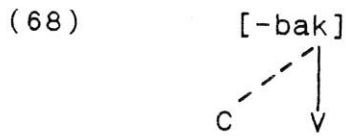
- (a) /s'iglo/ ———> [s'yig^ɥro] 'elbow'
 (b) /himarbeero/ ———> [h^ɥimarb^ɥeero] 'select'
 (c) /konne/ ———> [konn^ɥe] 'who'
 (d) /kandi/ ———> [kand^ɥi] 'urinte (sg. imp.)'

(67) Velars

- (a) /kišo/ ———> [cišo] 'hand'
 (b) /giro/ ———> [ʃiro] 'agony'
 (c) /k'ep'p'o/ ———> [c'ep'p'o] 'sit'
 (d) /s'ungitso/ ———> [s'uñʃitso] 'claw'

Palatalization of both velars and non-velars can be autosegmentally expressed as a [-back] feature spreading

leftward from the autosegmental tier to the C-slot of a consonant as in (68) below.



As in intervocalic weakening (65) consonantal modification before front vowels is irregular as in (66) and (67). Since the triggering environment is the same, one would expect uniform modification. However, the actual result is different. This irregularity can be accounted for in terms of sensitivity of phonological rules to relative strength of the input consonants.

Some phonological rules are sensitive to the strength hierarchy of segments (Katamba 1989:108). This means that less strong segments are more affected than stronger ones by the same phonological rules. Hence, velars which are less strong than non-velars in the hierarchy of point of articulation, are affected more by the palatalization rule than non-velars which are more strong than velars. Similarly, velars are affected more than alveolars, and alveolars are affected more than bilabials by the intervocalic weakening rule.^{25,26}

Notes to chapter Three

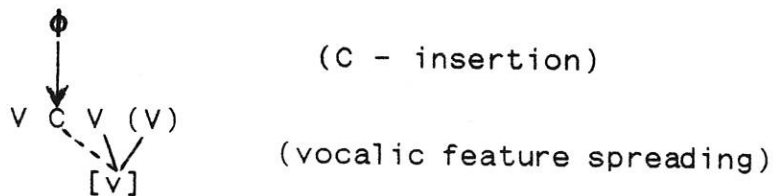
1. There is a further restriction that we shall see later as to which types of consonants are allowed in the coda.
2. The elimination of the feature [+/- syllabic] as a redundant feature (Goldsmith 1990:151) is based on this analysis.
3. (X) can be interpreted as (C) or as (V) depending upon the segmental tier unit it associates, as given above.
4. Clements and Keyser (1983:29) divided languages into four types based on the core syllable types they allow as below:

Type I : CV
 Type II : CV, V
 Type III: CV,CVC
 Type IV : CV, V, CVC,VC

As to Clements and Keyser then Anfillo is a Type IV language.

5. Nasals and first members of geminate halves in the coda are homorganic with a following consonant in the onset. Liquids have a non-distinctive default point of articulation.
6. The absence of [ʔ] in word initial position may be because of a historical loss just like that of the Amharic glottal stop. But the absence of [p',r, ii, uu] is not clear.
7. Hence, fact (i) in 1.4 is accounted for.
8. and [i,e,a,m,n,r] as or as part of some suffixes.
9. Probably, the occurrence or insertion of [o] in such environments as in (40c) may be a logical extension of the insertion in (40a) and (40b). On the other hand, the occurrence of [o] at this environment and the realization of the sonorant in the onset position while it can be realized in the coda without [o] may be a move towards the preferred CV type of syllable. Underlying /k'ar-/ or CVC becomes [k'aro] or CV CV.
10. Hence, facts (iii) and (iv) in 1.4 are accounted for.
11. Hence, fact (ii) in 1.4 is accounted for.
12. In each example here and in what follows the change under discussion only is indicated. When necessary, other changes are also indicated

13. Concerning the treatment of assimilation as an instance of spreading, see: Halle and Vergnaud 1980; Goldsmith 1981; Steriade 1982; Clements 1985b; Hayes 1985; Archangeli and Pulleyblank 1986; Hyman and Pulleyblank 1987; and Goldsmith 1990.
14. [v] , a small v in a square bracket is used conventionally to serve as a variable for any vowel.
15. Hence, fact (v) in 1.4 is accounted for.
16. [h̥] is a voiced glottal fricative.
17. It amounts to say that the glides get their feature specification from the right hand vowel. It turns out then that the glide epenthesis process is a result of two rules, one inserting a C-element in the skeletal tier and the other spreading a vocalic feature from the segmental tier to the inserted C-slot as below.



18. In fact, epenthesis can apply between a cluster of two identical consonants (apparent geminate) that arise across morpheme boundaries.
19. Hence, fact (vi) in 1.4. is accounted for.
20. [p̥] is a voiceless bilabial fricative. [b] is a voiced bilabial fricative. [r^h] is an aspirated flap liquid. [r̥] is a glottalized flap liquid.
21. Vowels and sonorant consonants, sonorants in general, are devoiced word finally in the imperative and jussive forms of verbs. Devoicing is an instance of strengthening or fortition.
22. Hence, fact (vii) in 1.4 is accounted for.
23. In the rule — R̥ = root - final.
24. Consonants are also labialized (rounded) before rounded vowels.
25. Palatalization is sensitive to two degrees of consonantal strength while intervocalic weakening is sensitive to three degrees.
26. Hence, fact (viii) in 1.4 is accounted for.

CONCLUSION

Most of the facts of segmental distribution, co-occurrence restrictions and phonological processes are accounted for in the non-linear analysis. In particular, the role of syllable structure and related notions of Licensing, Underspecification, and Strength Hierarchy are vital in making generalizations and in explaining:

- (a) the occurrence of affricates and geminates only word medially and the non-occurrence of all segments except [o] and few others word finally,
- (b) the permissibility of only word medial clusters of two consonants, with the first member being a sonorant, and the impermissibility of other co-occurrences,
- (c) the insertion of vowels and glides in word medial and final clusters, the fricativization of affricates following a nasal consonant, the weakening of affricates and geminates in imperative/jussive words, the weakening of non-geminate consonants in intervocalic position, the palatalization of consonants preceding front vowels, and the nasalization of vowels preceding a nasal-obstruent cluster, a geminated nasal, and a word final nasal consonant.

In general, the phonological facts above (a - c) are

conditioned by the principle of licensing and the syllable template of Anfillo.

Explanations for the rarity of fricatives or the asymmetry of the obstruent class, the non-occurrence of [p',r,ʔ,ii,uu] word initially may be found from further historical and comparative studies. Moreover, the researcher believes that further study especially in the verb morphology of the language may reveal a more adequate description of intervocalic weakening processes (IWP1 and IWP 2).

APPENDIX

List of Anfillo Lexical Items in Phonemic Transcription

/aabo/	'sun (day)'
/aak'o/	'black'
/aapo/	'eye'
/aaširo/	'ten'
/ando/	'again'
/anka/	'how'
/ašo/	'person'
/ats'o/	'sharp'
/awddo/	'four'
/bak'lo/	'mule'
/balitsi/	'over'
/bargetso/	'beauty'
/beritso/	'ash'
/berta/	forget (s.m.juss)
/beyyo/	'live'
/bik'albo/	'conduct'
/bondzo/	'calf'
/boono/	'dough'
/butso/	'kick'
/daapo/	'surprise'
/daap'o/	'snake'
/dangetso/	'elephant'
/dawitso/	'bear (local)'
/dawwitso/	'weak'

/dek'k'o/	'take'
/dibbo/	'hand'
/detso/	'dig'
/diho/	'fall'
/diito/	'night'
/dombo/	'vagina'
/dongillo/	'bird'
/dubbo/	'sing'
/dupino/	'corpse'
/ebba/	'that'
/eepo/	'cry'
/elto/	'desert stick'
/gaaro/	'wet'
/gaato/	'compartment (of a house)'
/gaašo/	'TEF'
/garo/	'bad'
/gašo/	'tooth'
/gino/	'spear'
/gipo/	'door'
/giro/	'agony'
/goggo/	'in'
/gonk'o/	'skin'
/googo/	'locust'
/gotto/	'road'
/gumbo/	'stick'
/gurmatto/	'knee'
/guro/	'granary'



/guto/	'mountain'
/gut'o/	'donkey'
/gutto/	'two'
/guuto/	'dirt'
/hani/	'this'
/himarbeero/	'select'
/his'aawo/	'salt'
/hi?o/	'twenty'
/ikko/	'one'
/intaaši/	'you (pl.)'
/kaaro/	'fight'
/kando/	'urine'
/kano/	'dog'
/kantso/	'oak'
/kašo/	'breath'
/katso/	'cook'
/keedzo/	'three'
/keetso/	'house'
/ketstso/	'chop'
/kišo/	'hand (palm)'
/konne/	'who'
/kudo/	'out'
/kundo/	'ant'
/k'ak'ro/	'diaphragm bone'
/k'aro/	'horn'
/k'awnno/	'short'
/k'ep'p'o/	'sit'
/k'immo/	'dirt'

/k'indo/	'meat'
/k'uipo/	'button'
/k'ut't'o/	'cut'
/labatse/	'dumb'
/maašo/	'grass'
/maatso/	'woman'
/makro/	'acknowledge'
/mango/	'heavy'
/mas'o/	'collect'
/mindzo/	'cow'
/mis's'o/	'laugh'
/murt'ut't'o/	'throwing stick'
/na?o/	'baby'
/noono/	'mouth'
/nuuši/	'we'
/ok'k'o/	'cold'
/oogo/	'big'
/paddo/	'count'
/paršo/	'horse'
/piro/	'worm'
/pito/	'wipe'
/putso/	'swim'
/s'aamo/	'bile'
/s'allo/	'porcupine'
/s'ammo/	'pure'
/s'iglo/	'elbow'
/s'igro/	'star'
/s'ullo/	'small'

/s'ungitso/	'claw'
/s'unt'o/	'little'
/s'unts'o/	'saliva'
/šaho/	'flower'
/šano/	'light'
/šarpo/	'breakfast'
/šatto/	'fear'
/ša?o/	'small'
/šeho/	'hear'
/šent'o/	'monkey'
/šiho/	'floor'
/šippo/	'sew'
/šuumo/	'BISANA'
	(a type of tree)
/šuumo/	'work'
/tallo/	'mud'
/tibbo/	'bat'
/t'allo/	'clean'
/t'ammo/	'foot'
/t'unno/	'buttock'
/utso/	'drink'
/waggo/	'year'
/yakko/	'leave'
/yango/	'sorghum'
/yirbbo/	'thread'
/yongo/	'wind'

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DECLARATION

I the undersigned, declare that the thesis is my original work, has not been presented for a degree in any other university and that all sources of material used for the thesis have been duly acknowledged.

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