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Feature specification, under-specification, and morphophonemic process and feature geometry of Amharic language

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Abstract - In linguistics, a peculiarity is the most basic unit of phonological structure that can be analysed in phonological theory. Distinguishing traits are categorized according to the natural segment classes they describe: major class traits, larynx traits, manner traits, and place traits. The paper does not have a specific section for methods. However, in this paper the author provides a detailed analysis of the phonological processes of assimilation in the Amharic language. The paper explains how assimilation predominantly takes place contiguously and mainly at word or morpheme boundaries, hence mainly morphophonemic in nature. The author discusses different types of assimilation processes such as voice assimilation, glottalization, palatalization, etc. and provides ample examples from the language. The paper also describes how most of the values in language are predicted on the basis of other features under combinatorial specification and radical under specification. Additionally, the paper describes the patterns of units of phonological analysis in Amharic, which occur in particular regular patterns that need to be discovered for each language. Overall, the paper provides a comprehensive understanding of feature specifications, morphophonemic process, and feature geometry of Amharic language.

Keywords: morphophonemic, under-specification, combinatorial, assimilation

I. INTRODUCTION

In the study of phonology, assimilation refers to the process by which a speech sound becomes more like a neighbouring sound in terms of certain features. This process is a critical component in understanding the phonological structure of a language, as it influences how sounds interact and change in different linguistic contexts. The paper in question provides a comprehensive analysis of phonological processes of assimilation in the Amharic language, examining how feature specification, under-specification, and morphophonemic processes contribute to the language's phonological structure. This analysis not only enhances our understanding of Amharic phonology but also situates the language within broader phonological theories.

The paper focuses on the assimilation processes within Amharic, a Semitic language spoken primarily in Ethiopia. Assimilation in Amharic is a significant aspect of its phonological system, affecting how consonants and vowels interact in various phonological environments. The paper dissects these processes by exploring feature specification, under-specification, and morphophonemic changes.

Feature specification refers to the detailed phonetic characteristics that define individual phonemes. In Amharic, assimilation processes often involve changes in these features to align with adjacent sounds. For instance, consonant assimilation can occur in terms of place of articulation, manner of articulation, or voicing.

A notable example is the assimilation of place of articulation in consonant clusters. In Amharic, when a nasal consonant precedes another consonant, it often assimilates to the place of articulation of the following consonant. For example, the nasal /m/ can assimilate to /b/ or /p/ in certain contexts, resulting in forms like [bɨm] instead of the expected [bɨn] before a bilabial consonant.

Feature specification also plays a crucial role in vowel assimilation. Vowels in Amharic can change their quality to match the features of surrounding vowels. This process is particularly evident in vowel harmony systems, where vowels within a word harmonize to share certain features such as frontness or backness. For example, in some dialects of Amharic, vowels within a word may shift to match the frontness or backness of the surrounding vowels, demonstrating a high degree of feature specification and assimilation.

Under-specification refers to the phonological theory that some phonetic features of a sound may not be fully specified and can be determined by contextual factors. In Amharic, under-specification can lead to assimilation processes where sounds adjust their features to align with those of adjacent sounds.

A key area where under-specification is evident is in the assimilation of voice. In certain phonological contexts, voiceless consonants may become voiced when adjacent to voiced consonants, and vice versa. This can be seen in processes such as voicing assimilation, where a voiceless plosive like /p/ may become voiced [b] when it appears before a voiced consonant in rapid speech. This phenomenon illustrates how sounds may be under-specified for voicing and adjust based on their phonological environment.

Another example is the assimilation of nasality. In some cases, nasal consonants in Amharic may assimilate to the nasality of adjacent vowels or consonants. For instance, a nasal sound might become more nasalized when it occurs before a nasalized vowel, highlighting how under-specification allows for flexible adaptation in assimilation processes.

Morphophonemics refers to the interaction between morphological and phonological processes. In Amharic, assimilation processes often involve morphophonemic changes, where phonological variations are linked to morphological structures.

A prominent example is the assimilation that occurs in prefixation and suffixation. When a morpheme that begins with a certain sound is attached to a root, assimilation may occur to align the sound with the initial consonant of the root. For instance, in Amharic, a prefix like /n-/ may assimilate to the place of articulation of the following root consonant, resulting in forms like [nd-] before a dental consonant instead of the expected [n-].

Assimilation also affects verb conjugation patterns in Amharic. For example, in the formation of certain verb tenses, the assimilation of prefixes to the root consonant can lead to variations in the pronunciation of the root. This morphophonemic process highlights how assimilation is not only a phonological phenomenon but also a crucial part of the morphological system of the language.

The paper provides ample examples to illustrate different types of assimilation processes in Amharic. These examples are crucial for understanding how assimilation operates within the language and for identifying patterns that are characteristic of Amharic phonology.

One of the key examples is the assimilation of nasals. In Amharic, nasal consonants often assimilate to the place of articulation of following consonants. For instance, in the word [nɨb] (meaning 'two'), the nasal /n/ assimilates to the bilabial /b/, resulting in a form that is

pronounced with a bilabial nasal sound. This assimilation demonstrates how consonants can adjust their place of articulation to match adjacent sounds.

Vowel harmony is another significant aspect of assimilation in Amharic. In words where vowels need to harmonize with each other, assimilation processes ensure that vowels within a word share certain features. For example, in a word like [kɨl] (meaning 'year'), the vowels harmonize to share the feature of being close back vowels. This harmony illustrates how vowel assimilation affects the overall phonological structure of the language.

The paper also highlights how assimilation processes are linked to morphological changes. For instance, in the formation of certain verb tenses, the assimilation of prefixes to the root consonant can lead to variations in pronunciation. This is evident in verbs like [sɨnʃ] (meaning 'to help'), where the prefix /s-/ assimilates to the place of articulation of the following root consonant.

While the paper does not provide a dedicated literature survey or review of previous research, it does cite important studies that contribute to our understanding of Amharic phonology. Notably, the paper references Bender and Hailu (1978), who describe major phonological processes observed in Amharic, including gemination, palatalization, and labialization. These studies provide a foundation for understanding the phonological characteristics of Amharic consonants and their interaction with assimilation processes.

The paper also cites Hayes and McCarthy, including McCarthy (2001), which provides insights into the phonological structure of Semitic languages, including Amharic. McCarthy's work on the phonetics and phonology of Semitic pharyngeals offers valuable context for understanding the phonological processes of assimilation in Amharic.

Overall, while the paper does not offer a comprehensive review of existing literature, it effectively incorporates relevant studies to support its analysis of assimilation processes in Amharic. These references enrich the discussion by situating the findings within the broader context of phonological research.

The paper offers a detailed analysis of phonological processes of assimilation in the Amharic language, focusing on feature specification, under-specification, and morphophonemic processes. Through ample examples and references to previous research, the paper enhances our understanding of Amharic phonology and its assimilation processes. Although it lacks a dedicated literature survey, the cited studies provide valuable context and support for the analysis. Overall, the paper contributes significantly to the field of phonology by elucidating the intricate assimilation processes that characterize the Amharic language.

II. METHOD

The paper does not explicitly mention any specific methods used in the analysis. However, it can be inferred that the author used a combination of descriptive and analytical methods to analyze the phonological processes of assimilation in the Amharic language. The author provides ample examples from the language to illustrate the different types of assimilation processes and their effects on the phonological structure of words. The author also discusses the patterns of units of phonological analysis in Amharic, which suggests that the analysis was based on a systematic examination of the language's phonological structure. Overall, the paper appears to be based on a thorough analysis of the phonological processes of assimilation in the Amharic language, using a combination of descriptive and analytical methods.

III. RESULTS AND DISCUSSION

Obstruent consonants (stops, affricatives and fricatives) may exhibit a three-way contrast at the same point of articulation between voiceless, voiced and glottalized. The later sometimes called ejectives, produce a sharp sound and analogous to the emphatic consonants of Amharic and other Semitic language (Wright et al, 2002). Another distinctive trait of the consonantal system of

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Amharic is the existence of labialized gutturals. All consonants, except **h** and the glottal stop, may occur in a long or geminated form.

Table 1 Amharic consonant clusters

Amharic consonant		Bilabial	Labiodentals	Dental	Alveolar	Palatal	Velar	Glottal
Stops	Vl	P		T	D		k	ʔ
	vd	B					g	
Labialized	Vl						kʷ	
	vd						gʷ	
glottalized	Vl	P′		t′			k′ kʷ′	
Fricative Slit	Vl		F					H
	vd		V					
Grooved	Vl				S	ʃ		
	vd				Z	ʒ		
Glottalized	Vl				ʦ′			
Affricatives	Vl					ʧ		
	Vd					ʤ		
glottalized	Vl					ʧ′		
Lateral					L			
Nasal		M			N	ɲ		
Semi vowel		W			R	j		

Table 2 Amharic vowel clusters

	Front (unrounded)	Canter (-/+)	Back (rounded)
(high)	i	ɨ	U
(mid)	e	ə	O
(low)		A	

Table 3 Feature specification in Amharic Language consonant and vowel cluster

Features		Coronal obstruent (+con,-son,+cor)					Palatal obstruent (+cor, +dor)					Non coronal obstruent (+con,-son,-cor)									Laryngeal (-cons,-son)	
C & V		t	t′	d	s	Z	ʃ	ʒ	ʤ	ʧ	ʧ′	p	b	f	v	k	g	gʷ	kʷ	p′	ḱ′	h	ʔ
Class feature	Con	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Son	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	syll	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	lab	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	+	+	+	-	-	-

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Place feature	rnd	0	0	0	0	0	0	0	0	0	0	-	-	-	-	0	0	+	+	-	0	0	0			
	cor	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-			
	Ant	+	+	+	+	+	-	-	-	-	-	-	-					-	-	-		-	-			
	dist	+	+	-	+	+	+	+	+	+	+	0	0	0	0	0	0	-	-	-	-	-	-			
	dor	-	-	-	-		-	-	-	-	-	-	-	-	-	+	+	+	+	-	+	-	-			
	hi	-	-	-	-	-	+	+	+	+	+	-	-	-	-	+	+	+	+	-	+	-	-			
	lo	0	0	0	0	0	0	-	-	-	-	0	0	0	0	-	-	-	-	0	-	0	0			
	bk	0	0	0	0	0	0	-	-	-	-	0	0	0	0	+	+	+	+	-	+	0	0			
	ten	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	Ph	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	ATR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Laryngeal feature	voic	-	-	+	-	+	-	+	+	-	-	+	-	+	-	+	+	-	-	-	-	-	-			
	SG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-			
	CG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+			
Manner feature	Con	-	-	-	+	+	+	+	-	-	-	-	-	+	+	-	-	-	-	+	-	+	-			
	stri	-	-	-	+	+	+	+	+	+	+	-	-	+	+	-	-	-	-	-	-	+	-			
	Lat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	del rel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	nas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			

Table 4 Consonant and vowel feature specification

feature		Affricates (+con,-son,+/-cont			Sonorant consonants Nasal & liquids (+cons,+son)					Glide (-con, +son)		Vowels (-cons,+son)								
C &V		ʤ	ʧ	ʧʼ	m	n	ɲ	l	r	J	w	i	ɨ	u	ə	e	o	a	j	w
Class feature	con	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-

	son	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	syll	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+
	lab	-	-	-	+	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+
	rnd	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	+	-	-	+
	cor	+	+	+	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
Place feature	Ant	-	-	-	+	+	0	+	0	0	0	0	0	0	0	0	0	0	0	0
	dist	+	+	+	0	-	+	-	-	-	-	0	0	0	0	0	0	0	0	0
	dor	+	+	+	-	-	+	-	-	+	+	+	+	+	+	+	+	+	+	+
	hi	+	+	-	0	0	+	0	0	+	+	+	+	+	-	-	-	-	+	+
	lo	-	-	+	0	0	-	0	0	-	-	-	-	-	-	-	-	+	-	-
	bk	-	-	-	0	0	-	0	0	-	+	-	-	+	-	-	+	-	-	+
	ten	0	0	0	0	0	-	0	0	-	-	+	+	+	+	+	+	-	+	+
	pha	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+
	ATR	0	0	0	0	0	0	0	0	0	0	+	-	+	+	-	+	-	-	-
Laryngeal feature	voice	-	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	SG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	CG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manner feature	cont	+/-	+/-	+/-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+
	stri	+	+	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	lat	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
	Del rel	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	nasal	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-

3.1 Morphophonemic process

Morphophonemic process is the processes which study of the phonological realization of the allomorphs of the morphemes of a language or the study of the phonemic representation of morphemes in different environment (Nurhayati, 2015).

According of Baye (1986:27), Morphophonemic is a process of variation of morphemes owing to the influence of phonetic factors on account of the phonemes of their neighbourhood. This variation of morphemes can be feature assimilation with the neighbouring sounds, changing of the original places (metathesis), omission of sounds/ segments (deletion), and repeating of sound or stress of sounds and segments (Gemination), and etc (Steriade, 1982). Assimilation, metathesis, epenthesis, deletion and gemination are commonly found in the morphophonemic process (Baye, 1986)

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Morphophonemic process it will be related to the affixation processes, there is a term called morphophonemic processes (Smith, 1977). The term morphophonemic processes is derived from two words, they are "morpheme" and "phoneme". The word Morphophonemic refers variation in the form of morphemes because of the influence phonetic factor or the study of this variation (Tomas et al., 2015).

The form change of morpheme is based on the sounds surround it which relates to the correlation between morphemes and phonemes (Aziz & Nolikasari, 2020). It is also called morphophonemic changes. According to Ramlan morphophonemic refers the changes of phoneme as a result from the merging of one morpheme and another. He also states that morphophonemic process is a process of form changes in which phoneme and morpheme are involved (Nurhayati, 2011)..

On account of this morphophonemic process is a process that existed in phonology so as to show the relation between morphology and phonology. It is a method of analysis of the phonological factors that appear in the morpheme (Lass,1984).

There are a variety of morphophonemic or phonological processes but there are three major phonological processes commonly observed in Amharic consonants. These are **gemination**, **palatalization** and **labialization** (Garoma, 2012).

3.2 Gemination

Consonant gemination in Amharic is both lexical and morphological. Lexical gemination is observed in such words as /**gäna**/ 'still' and/**gänna**/ 'Christmas'. The difference in the meanings of the two words comes only because of the geminated [n] occurred in the second word. Morphological gemination occurs in conjugation of verbs like in the perfective stems such as /**säbbärä**/ 'broke' and /**wässädä**/ 'took'.

Gemination. Length is lexically distinctive in consonants and there is a grammatical process in at least one major word class, such as nouns or verbs, in which a short ("single") consonant is replaced by a long ("double", "geminate") consonant (Palmer, 1957; 1958). In same languages, such as English, geminate consonants occur only at grammatical boundaries, as in compound words like pen-knife (nn), book-keeper (kk), or at word boundaries such as seem more as against see more. Otherwise, the difference is not distinctive in such languages, although English spelling frequently uses double consonants to represent other differences in pronunciation (evg. Hoping: hopping, filer: filler) or even to distinguish words pronounced alike (e.g. Finnish: finish). Example: All the consonants of Amharic except /h/ occur both short and long, although the long consonants are less common than the short ones. In many instances the occurrence of one or the other is unpredictable (e.g. **wana** 'swimming' **wanna** 'principal', 'chief'), i.e. the difference is lexically distinctive (Leslau,1968). In most cases, however, long consonants are related to grammatical processes. Most often it is the second consonant of the root which is geminated, as in the regular past tense of most verbs (**sebbere** 'he broke'), in the intensive (**sebabbsre** 'he smashed'), and in a kind of passive verbal noun (**sibbari** 'broken off piece').

fəraš → foam, fear
fərraš → remain
gəf → wrong
gəff → stripped
səme → my name
səmme → I having kissed

Gemination has existed in different ways on account of the features of that language for instance in Amharic language in terms of the nature of segments and phonemes, assimilation or sharing of features in terms of different phonetic environment, and typical sound sequences (Kenstowicz & Kisseberth, 2014).

- ✓ In terms of the nature of phonemes and segments
  [ťälla] [bunna] [dämmɨna]
  The above words have stressed feature in nature.

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- ✓ Taking of account within the neighbouring segments by sharing feature or duplicating of that phonetic property
  Ashome = [as-] + šomä ⟶ found /äššomä/
  The affix [s] – duplicating and sharing the features of [š] sound in the lexeme in the phonetic environment of alveolar sound.
- ✓ Taking of an account the similar sounds come together subsequently (typical sound sequences)
  [as-] + [sära] ⟶ [assira]

Labialization (rounding) affects every consonants proceeding [o] as in /qʷ ommä/ 'stop' and /gʷ ottätä/ 'pull'. However, palatalization is restricted to dentals in deverbalization processes (Baye, 1994).

Examples are presented below. /wäsd-/ 'take' /wäsäd-i/ [wäsäj] 'taker' /tärrt-/ 'narrate' /tärrät-i/ [tärräč] 'narrator' The example above shows when dentals such as [d] and [t] are followed by the back vowels like [i] and [e], they are changed to their corresponding palatals [j] and [č] due to phonological factors.

In Amharic, clusters of two consonants are allowed around the middle and end pats of words. Initial clusters are highly restricted. In the case of impermissible consonant clusters, the vowel of epenthesis [ɨ] is inserted (Rose,1997).

3.3 Assimilation

In Amharic, assimilation is a popular phonological process. The process predominantly takes place contiguously and mainly at word or morpheme boundaries, hence mainly morpho-phonemic in nature. There are different types of assimilation processes such as voice assimilation, glottalization, palatalization, etc. Each of these has been discussed in this assignment paper with ample examples from the language. Though the interaction between consonants is keen, there are assimilation processes which take place due to the interaction between consonants and vowels in processes such as nasalization and vowel rising (McCarthy, 1988).

An assimilation rule is a rule that makes neighbouring segments more similar by duplicating a phonetic property.

– For example, the English vowel nasalization rule states that vowels become nasalized before a nasal consonant within the same syllable.

Due to the complexity of the elements during the coordination, the similarity of the process occurs. The image can be explored in terms of change and direction. In terms of change, the image can be partial or complete.

Example

[gänbär] ⟶ [gäŋbär]

This happens owing to "b" sounds. "b" is a bilabial sound and the sound it precedes is alveolar sound. This shows that there is an articulation difference in terms of places where they articulated. The two sounds come together within words, the one sounds took some features of the neighbouring sounds. The process is [n] changes to [ŋ]. On account of this, the gap between the two sounds should be changed or deleted.

Here is another example; Athedm - /athedm/ - [attɨhedm] when we looked for this change /h/ is totally changed into [t].

In terms of changing the features of segments have two ways of changing direction or assimilation. These are progressive and regressive assimilation.

In case of **progressive** assimilation the trigger comes before the target so that the assimilation operates forwards: the above example can be depicted the process of progressive assimilation [ättɨhedm] here is the assimilation is operated forwardly.

Regressive assimilation is an assimilation in which the sound that undergoes the change (the target) comes earlier in the word than the trigger of assimilation, in other words the change operates backwards (Kanshouwa, 2020). For instance, /**änbäsasä**/ - [**ämbässa**]

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The above shown assimilation depicts usually in Amharic language is to be partial assimilation and in terms of the process direction is a regressive assimilation.

Labialization

It has existed just as the non-labialized sounds contacted with the labial sounds they become a labialized sounds. For instance, /**änbässä**/ becomes [**ämbässa**]

/**känfär**/ becomes [**kämfär**]

The phoneme /n/ in the phonetic representation of [m], /n/ comes before the bilabial sound /b/- is the plosive bilabial sound. However, /n/ is an alveolar sound. In the two phonemes, we do have a difference of feature in the two phonemes in place of articulation. The phoneme /n/ is changed to [m] owing to the process of partial assimilation.

/n/ ------ [m] ____/b/

This process happens just as the phoneme /n/ comes before the bilabial sound it should be changed into [m]. However, this is not always true owing to the phoneme. For instance, /känfär/ is becomes [kämfär]. From this we understood that the phoneme /n/ comes before the /f/ sound. This depicts that the phoneme /n/ comes before the /f/ sound can be changed into [m].

So, /n/-------- [m] _____ { /b/ /f/ }

Thus, the phoneme /n/ comes before the/b/ and/f/ always changed into[m].

3.4 Epenthetic

It is a morphophonemic process which has existed in a language for the sake of eradicating illogical duplicating of segments in word. In Amharic language is not allowed to duplicate more than two consonant sounds at the final position of a word. In case, more than two consonant sounds comes together after the vowel sounds at the final position we have to insert the epithetical vowel[ɨ]. For instance, in Amharic word /läkä/ inserted the segment [-h] of the second class indicator we found [läkk-h] (Hailu & Hailemariam, 2012). From this we looked for three consonant sounds duplicated subsequently after the vowel sound. On account of the rule of the language, this organizational principle is prohibited. Thus, in case of preserving the organizational principle of the language from violating we should have to add the epithetic sound after the second consonant sound. After the whole process is done we can get the correct underlying representation of the phoneme [lɨkkɨh]. The only vowel to work for this process is the centre high vowel [ɨ] or epithetical vowel.

3.5 Deletion

It's a morphophonemic process which has happed in case of neighbouring segments. Hence, among the typical sound sequence one is omitted because of deletion.

For instance, Ayele - /häyyäl/

- **/ä/** → a/h
- **hayyäl** → h ɵ/-a
- **ayyäl** → [ayyäl]

3.6 Palatalization

It is a morphophonemic process, non-palatal sounds gate the palatalization feature comes before the front vowel [i] or [e]. Palatal assimilation can be partial and complete. In partial palatal assimilation, consonant phoneme sounds partially changed into palatal sounds. When we speak consonant sounds which has a palatal sound features, our tongue is in a high position towards hard palate which produced with the front of the tongue near or touching the hard palate or with the blade of the tongue near the hard palate. We always insert [j] in the top of such consonant sounds.

- bet [bʲet]
- t'is [t'ʲis]
- ḱim [kʲäm]
- siso [sʲiso]

Journal of Language and Pragmatics Studies, Volume 3 Number 3 (Dec 2024), p. 120-138
e-issn 2984-6051 DOI: https://doi.org/10.58881/jlps.v3i2
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The second one is full or complete palatalization. In this process the alveolar sounds should be changing into the palatal sounds. The complete palatalization shown the consonant sounds becomes before [e] or [i] sound.

- **/gädal-i/** → [gäddi]
- **/läbbs-i/** → [läbbiš]
- **/gämmät-i/** → [gämmič]

Vowel harmony
When a rounded vowel '**u**' or '**o**' occurs in the root, the tendency is to harmonize the vowels '**ə**' and '**ä**' with the rounded vowels. Thus, the sequence ə-u may be come **u-u**, for instance

- **qəmburs** and **qumburs** meaning fat white grub;
- **buruk-** blessed instead of **bəruk**
- **səlluse** and **sulluse** meaning ornamental colour for mules.
- **bəgunğ** and **bugunğ-** boils(sore)
- **bəgʷər ,bəgur** and **bugur –** furuncle

ə - o may become **u – o;**

- **məšo** and **mušo** – dirgo
- **šəro** and **šuro** -flour of roasted peas, sauce made from such flour.

u-ə may become **u-u**

- **šulləda** and **šulluda –** flash of the thigh
- **šurrəbba** and **šurrubba –** braided hairdo
- **buləkko ,bulukko** and **bəlukko ,bələkko** –blanket

ä- o may become **u-o** or **o-o**

- **mägogo** & **mugogo** also **məgogo –** griddle
- **sämbo** and **sombo –** a kind of tree
- **tälo** and **tolo-** soon

o – ä may become o-o

- **wärräta (**pronounced **worräta)** and **worrota –** benefit, favour

NB: owing to some of the above mentioned examples the origin is unknown, it's quite possible that the rounded vowel **u** or **o** was the original one and it become dissimilated into **ə** owing to the preceding or following **u** ; thus, and original

Šulluda may have become **šulləda**

In the following example the original vowel was the round one so the original

- **qurrunfud** → clove is beside qərənfud
- **gumuruk** → customs besides gəmruk (also ğəmruk)
- **mulu** → full besides məlu

Voice assimilation in - **əya** becoming- **iya** occurs in **liyalf** in order that he passes instead of **ləyəlf.**

Underspecification
In the first place, phonological processes of assimilation are preferably expressed by spreading a feature or node which is already present in the environment triggering the change.
One major point of debate is whether one or both values of a given feature should be specified underlyingly: advocates of Contrastive Specification (Clements, 1988; Steriade, 1982) generally argue that both [+] and [–] values of a feature must be present for segments where that feature is contrastive, while proponents of Radical Underspecification (e.g. Archangeli 1984, Pulleyblank 1986) claim that, since the lexicon is properly the depository of unpredictable, idiosyncratic information, all redundant phonological features should be excluded from the lexical representations of words; predictable features are inserted by rule, generally at the end of the lexicon. Only one value for each feature, [+] or [–], is allowed underlyingly.

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In the simplest case, one segment is chosen as fully underspecified, and the others are assigned features based on how they differ from that segment. The more recent approach of Combinatorial Specification Archangeli and Pulleyblank similarly rejects the systematic inclusion of both contrastive feature values, but does permit the unmarked feature to be specified in particular. The full specification of features stated at the first point of my task (Zoll, 1996).

Table 5 Under specification of vowel segments
Future under contrastive specification of vowel sounds

feature	i	E	ɨ	Ä	A	O	U
high	+	-	+	-		-	+
low				-	+		
back	-	-	+	+			
Round			-	-		+	+

We understood the above specification is, for example, /i/ and /e/ differ only in their values for [high], and so they must both be underlyingly specified for that feature. A feature such as [low] is distinctive only for /ä/ and /a/, so other segments need not be specified for it.
Under Combinatorial Specification, as well as its predecessor Radical Underspecification, most of the values in the above are predicted on the basis of other features. I take /ɨ/ to be the fully underspecified vowel just as it is the vowel that is inserted by epenthesis, and the representations which result from this assumption turn out to have many benefits. Thus [+high], [–low], [+back], and [-round] are the default values; only the opposite values are present underlyingly.

Under combinatorial specification

Table 6 Under combinatorial specification

feature	**i**	**E**	**ɨ**	**Ä**	**A**	**O**	**U**
high		-		-		-	
low					+		
back	-	-					
round						-	-

From the above we understood that the values given here are precisely those by which the segment in question differs from /ɨ/, except that /a/ does not include [–high] since this value is trivially predictable from [+low].
Eliminating redundant features, Amharic has the following underspecified features for consonants. Redundant features are not marked.

Consonant underspecification feature

Table 7 Underspecified feature matrix for Amharic consonant

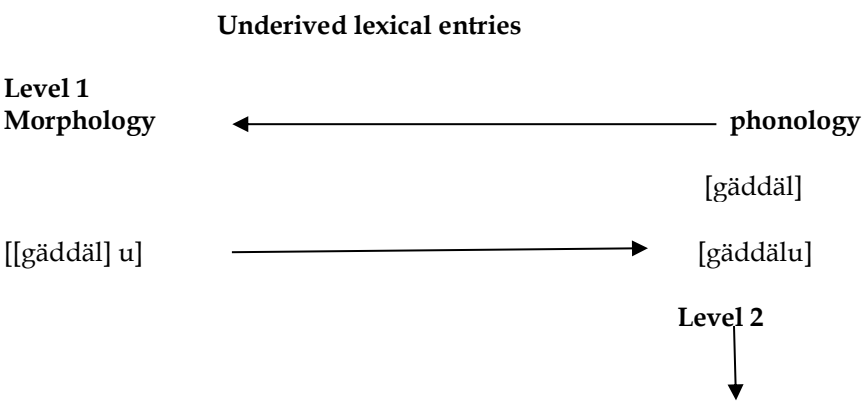
Phon.	Con	Son	Cor	Ant	Dis	Lab	Hi	Lo	Ba	Cont	Str	La	Na	Vo.	Eje.	Cons gl
p	+	-	-	+	-	+					-			-	-	-
p′	+	-	-	+	-	+					-				+	+
b	+	-	-	+	-	+					-			+		
t	+	-	+	+	-						-			-	-	-
d	+	-	+	+	-						-				-	+
k	+	-	-	-	+						-			-	-	-
g	+	-	-	-	+						-			+	-	-
ḱ′	+	-	-	-	+						-				+	+

f	+	-	-			+				+	+			-	-	-	
v																	
h	-															-	
ʔ	-										-					+	
3																	
s	+	-	+	+						+	+			-	-	-	
z																	
š	+	-	+	+	+					+	+			-	-	-	
m	+	+	-	+	-	+					-		+				
n	+	+	+	+	-								+				
ɲ	+	+	+	-	+						-		+				
l	+	+	+	+	-							+	-				
r	+	+	+	+	-					+			-				
w	-	+				+	+	-	+	+			-				
j	-	+		+			+	-		+			-				

Notion of Lexical Phonology (LP) in Phonological process

LP concerns the interface between phonology and morphology. It is developed by Paul Kiparsky's work in (1982/1985) and some other phonologists (Booji, 2006: 94). It claims that morphology and the rules of word phonology apply in tandem. To what extent and how the morphological structure of words conceptualize their phonetic realization is its basic issue. If we are given a word with its underlying phonological form, all the relevant rules of word phonology are applied to it. A further morphological rule to that word might be applied in its derived new phonological form. This leads to the creation of a new domain of application for the rules of word phonology. In this way, the lexical phonetic forms of words are derived. These words can be joined together in phrases and other larger constituents by the rules of syntax. It is the post lexical rules, accounted for by the post lexical level, that are applied after syntax (ibid.). Thus, the theory holds that there are two distinct types of phonological rule applications. The first is when rules apply within the lexicon (the lexical rules), while the second is when rules apply to the output of the syntactic component (the post-lexical rules, sentence level or phrasal phonology) (Mohanan, 1982).

In lexical morphology and phonology, the interaction between morphology and phonology has been modelled in terms of the levels of interaction in the lexicon. The assumption underlying the model is that morphological processes, e.g., affixation are interwoven with phonological operations like stress assignment, and that items exhibiting different behaviour may be associated with different levels.



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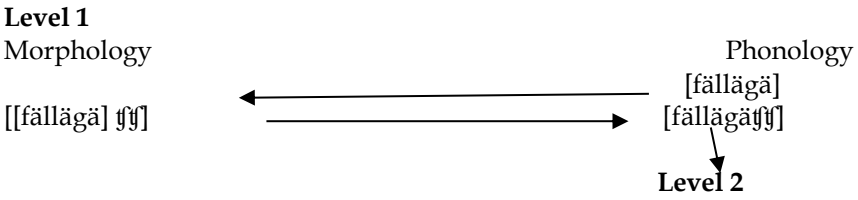
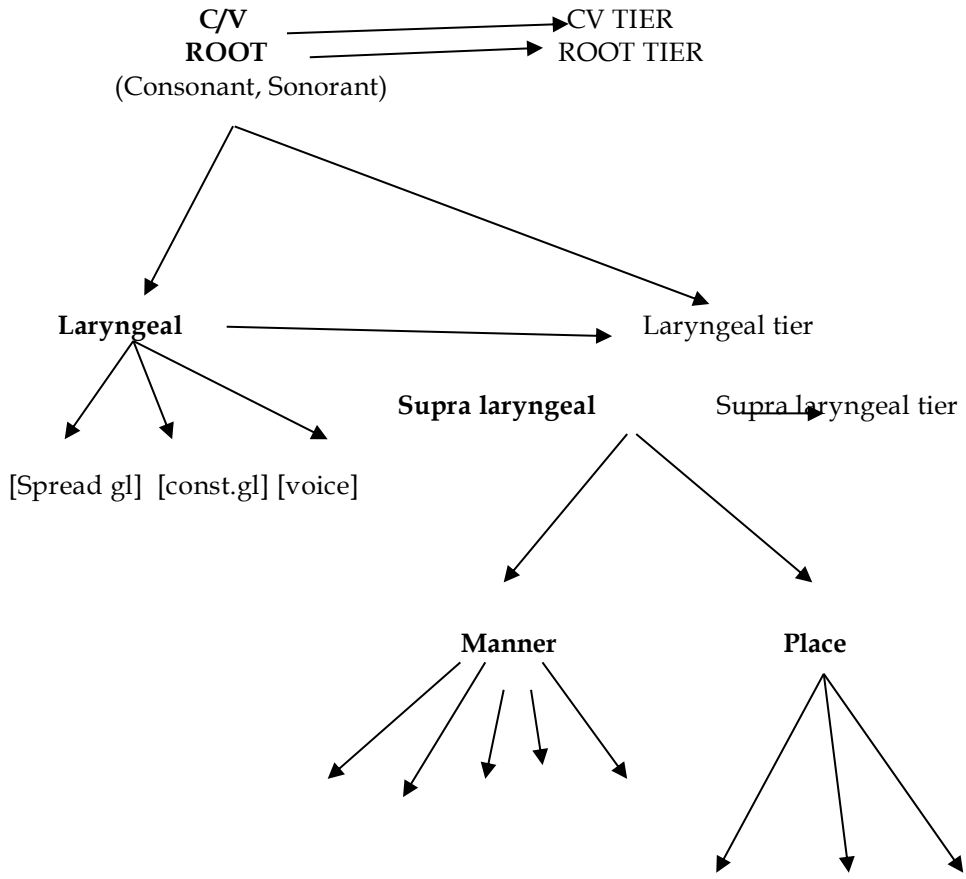


The theory maintains that level 1 rule must come before or precede all level 2 rules. These, in turn, must precede the post lexical ones. If a particular rule applies at level 1, it will always have precedence over those rules which are at level 2; if a particular rule is at level 2, it will always precede any rules which apply post-lexically. Thus, the ordering of levels has serious implications for the way in which rules interact (ibid.). We can notice that level 1 rules are normally more idiosyncratic than level 2 rules and often the meaning of level 1 affixes is unclear; their phonological effects are unsystematic and their applicability is erratic. Level 2 rules, on the other hand, have fewer exceptions and their phonological effects and semantic properties are more predictable.

Feature Geometry

A phonological process by which one segment, the target, takes on a feature or a set of features of another segment (i.e, the trigger), within a specified domain is referred to as assimilation. The vast majority of languages assimilation processes obtain between strictly adjacent segments, but some languages display long distance assimilatory effects.

Regarding the Feature Geometry model Kebede states that the theory is a recent development stemming from Autosegmental phonology. Citing Pullyblank and Paradis and Prunit, Kebede explains that distinctive features are organized into natural classes that make up sets (Negash, 2015). These sets of features are represented by means of hierarchical trees called Feature Geometry. Each feature and each node of the feature in the tree constituents is a possible locus for a phonological rule. The Feature Geometry proposed by Clements (1985) can be summarized as follows.



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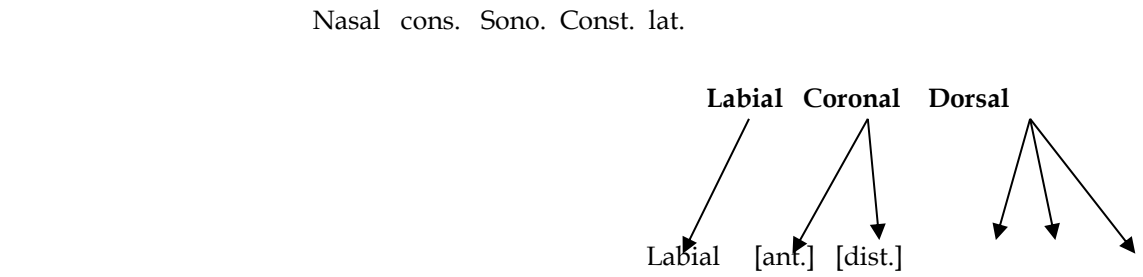

Figure 1 Feature Geometry

In nonlinear approaches to phonology such as Autosegmental Phonology or Feature Geometry, assimilation occurs when a distinctive feature (or subset of features) within a segment changes to agree with the feature(s) of an adjacent segment. This is achieved through linking and the de-linking of features (Clements, 1985; McCarthy, 1988). In other words, in Autosegmental phonology, assimilation is associating or linking a spreading feature with a target root node. This process is also termed "feature spreading" whereby a feature spreads from a trigger to a target.

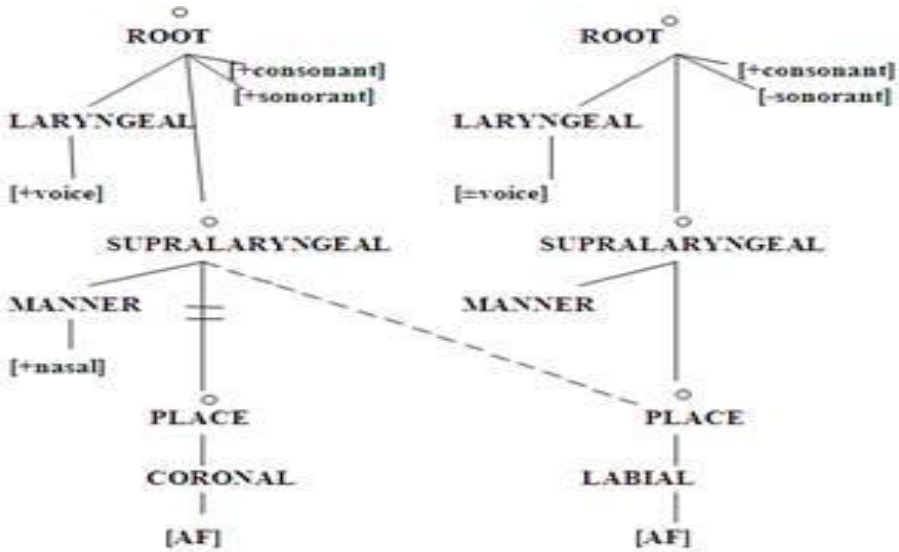

Figure 2 Feature spreading

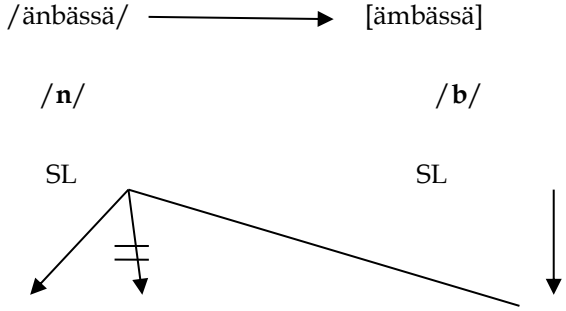

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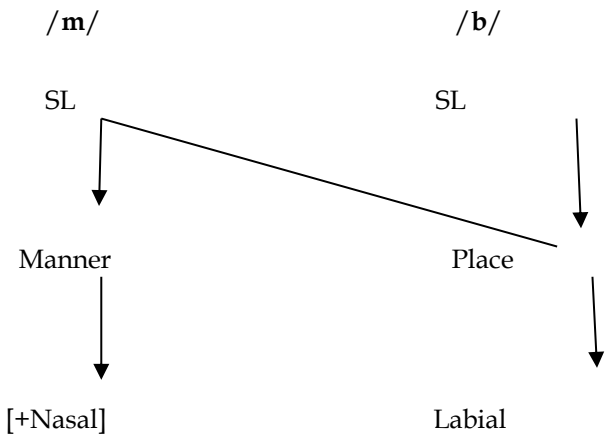
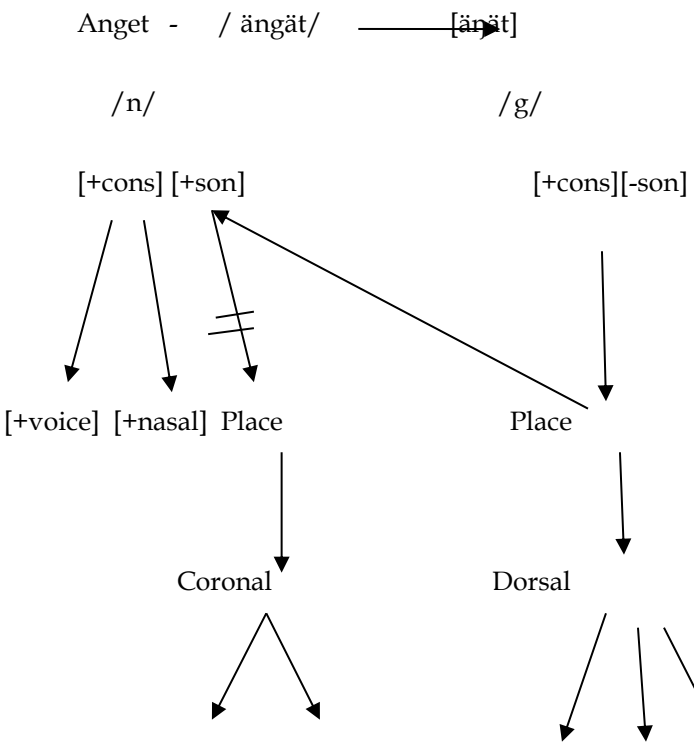
Figure 3 Place assimilation

The process of delinking the nasal coronal/**n**/ from its distinctive feature. Accordingly, the assimilation process consists of spreading the labial feature linked to the labial /**b**/ left ward to the nasal coronal/**n**/, and simultaneously delinking the coronal feature of the nasal coronal /**n**/ from its own place of assimilation.

After delinking of the nasal coronal /**n**/ from its distinctive feature, the nasal coronal /**n**/ acquires the distinctive feature of the labial /**b**/. This happens after the spreading and /**n**/ is realized as a nasal labial /**m**/ as is depicting in the following. This nasal assimilation /n/ becomes [m] in the environment of /**b**/ sound.



Here is another example



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+ ant - dis + high - low - back

From the above figure we understood that the segment the process of delinking the nasal coronal/**n**/ from its distinctive feature. Accordingly, the assimilation process consists of spreading the dorsal feature linked to the velar /**g**/ left ward to the nasal coronal/**n**/, and simultaneously delinking the coronal feature of the nasal coronal /**n**/ from its own place of assimilation.

After delinking of the nasal coronal /**n**/ from its distinctive feature, the nasal coronal /**n**/ acquires the distinctive feature of the labial /**b**/. This happens after the spreading and /**n**/ is realized as a nasal dorsal /**ŋ**/ as is depicting in the following. This nasal assimilation /n/ becomes [ŋ] in the environment of /**g**/ sound.

Phonemic Analysis of the American approximants [ɹ] & [ɹʷ]

Let us start with some formalism for describing the environments where allophones occur. The symbols slash, "**/**", as used in phonology, means "in the environment." A long underline stands for where the allophone occurs relative to its neighbours.

The focus sounds are the voiced alveolar central approximant [ɹʷ], and the (slightly) rounded voiced alveolar central approximant [ɹ].

1. Migrants [maɪgɹʷants]
2. Or [ˈɔɹ]
3. From [ˈfɹʷʌm]
4. Shire [ˈʃaɪɹ]
5. Tripling [tɹʷɪplɪn]
6. Metaphor [ˈmɛtəˌfɔɹ]
7. Iridium [Iˈɹʷɪdiəm]
8. Proclivities [pɹwoʊˈklɪvəɾiz]
9. Romancing [ɹʷoʊmænsɪŋ]
10. February [ˈfɛbjuɛɹʷi]
11. Dwarfing [dwɔɹfɪŋ]
12. Assure [əˈʃuɹ]
13. trek [ˈtɹʷɛk]
14. Homeric [hoʊmɛɹʷɪk]
15. debriefed [dibɹʷift]
16. reply [ɹʷiplaɪ]
17. Iraqi [Iˈɹʷɑki]
18. preys [pɹʷeɪz]
19. ranted [ɹʷæntəd]
20. crucible [kɹʷusəbəl]
21. indiscriminately [Indəsˈkɹʷmənətli]
22. fear [ˈfɪɹ]
23. dreadful [dɹʷɛdfəl]
24. feldspar [fɛldpɑɹ]

[ɹʷ]

/ g _____ä (1)
/ f _____Λ (3)
/ t_____ɪ (5)
/ I_____ ɪ (7)
/ p ___ o (8)
/ O____m (9)
/ ɛ_____ɪ (10)
/ɛ_____ ɪ (13)
/ t_____ɛ (14)
/ b_____i (15)
/ [word ___ i (16)
/ ɪ_____ɑ (17)
/ P____ e (18)
/ [word____ æ (19)
/ K____ u (20)
/ k_____m (21)
/ d_____ɛ (23)

[ɹ]

/ ɔ___] word (2)
/ aɪ____] word (4)
/ ɔ _____] word (6)
/ ɔ___ f (11)
/ u____] word (12)
/ f ____] word (22)
/ ɑ____] word (24)

From the above, we understood that the alveolar sound is commonly followed and proceeded by labial sounds can affect the alveolar which is called coronal sounds. On account of this, we found that the voiced alveolar central approximant [ɹʷ], and the (slightly) rounded voiced alveolar central approximant [ɹ] in different environment. This is called complementary distribution of the phoneme. The segments that always come before the rounded vowel and even unrounded vowel they could be labialized. The lip rounding of /ɹ/ is usually included in the pronunciation of the /t/ before it. [ɹ] becomes voiceless [ɹ] in the environment following [p] or [t] or [k] but using feature matrices captures the broader generalization that this allophonic variation happens to an entire natural class in the environment of another natural class.

These feature categories are in turn specified further on the basis of the phonetic properties of the respective segments. In order for phonemes belong to a certain natural class, they must have the same distinguishing features as the articulation or a similar sound. We can find distinguishing features between two words by finding the minimal pair between them. The minimal pair is when two words sound the same but differ in definition because the pair has different phonemes.

Distinctive features: the smallest components of sounds. Segments are made up of a number of different constituent parts. To begin with, we can think of the articulatory gestures that make up any given speech sound, such as the tongue, the lips, the vocal folds, etc. For example, although the regular plural suffix of nouns in English is written orthographically with the letter s, its pronunciation varies between [s] and [z] depending on the voicing of the preceding consonant (at the end of the root): cats vs. Dogs.

The units of phonological analysis in any given language occur in particular patterns that have to be discovered for each language; such regular patterns are the subject of a phonological description of the units given language employs. Providing an analysis of the phonological processes of assimilation in Amharic, this is expressed by spreading feature or node already present in the environment triggering the change, expressing how most of the values in the language are predicted on the basis of other features under combinatorial specification and radical underspecification.

Arguing that the vowel/ɨ/is the fully underspecified vowel and is inserted by epenthesis, resulting in representations with benefits due to phonological factors. Describing the patterns of units of phonological analysis in Amharic, which occur in particular patterns that need to be discovered for each language.

Another distinctive trait of the consonantal system of Amharic is the existence of labialized gutturals. All consonants, except **h** and the glottal stop, may occur in a long or geminated form. Morphophonemic process it will be related to the affixation processes, there is a term called morphophonemic processes (Lloret-Romanyach, 1988). The term morphophonemic processes is derived from two words, they are "morpheme" and "phoneme". The word Morphophonemic refers variation in the form of morphemes because of the influence phonetic factor or the study of this variation (Longman). On account of this morphophonemic process is a process that existed in phonology so as to show the relation between morphology and phonology. It is a method of analysis of the phonological factors that appear in the morpheme. There are a variety of morphophonemic or phonological processes but there are three major phonological processes commonly observed in Amharic consonants. These are **gemination**, **palatalization** and **labialization** (Bender and Hailu, 1978). In the simplest case, one segment is chosen as fully underspecified, and the others are assigned features based on how they differ from that segment. The more recent approach of Combinatorial Specification Archangeli and Pulleyblank similarly rejects the systematic inclusion of both contrastive feature values, but does permit the unmarked feature to be specified in particular (Kim & Pulleyblank, 2009). The full specification of features stated at the first point of my task.

In lexical morphology and phonology, the interaction between morphology and phonology has been modelled in terms of the levels of interaction in the lexicon. The assumption underlying the model is that morphological processes, e.g., affixation are interwoven with phonological operations like stress assignment, and that items exhibiting different behaviour may

be associated with different levels. A phonological process by which one segment, the target, takes on a feature or a set of features of another segment (i.e, the trigger), within a specified domain is referred to as assimilation. The vast majority of languages assimilation processes obtain between strictly adjacent segments, but some languages display long distance assimilatory effects. The segments that always come before the rounded vowel and even unrounded vowel they could be labialized. The lip rounding of /ɪ/ is usually included in the pronunciation of the /t/ before it. [ɪ] becomes voiceless [ɪ] in the environment following [p] or [t] or [k] but using feature matrices captures the broader generalization that this allophonic variation happens to an entire natural class in the environment of another natural class.

The paper does not have a separate section for results. However, the paper provides a detailed analysis of the phonological processes of assimilation in the Amharic language, and sheds light on the phonological structure of the language. The paper discusses different types of assimilation processes, such as voice assimilation, glottalization, palatalization, nasalization, and vowel rising, and provides ample examples from the language to illustrate these processes. The paper also discusses the role of feature specification, underspecification, and morphophonemic process in the phonological structure of the language. Overall, the paper provides a comprehensive analysis of the phonological processes of assimilation in the Amharic language, and contributes to our understanding of the phonological structure of the language.

IV. CONCLUSION

The paper concludes that assimilation is a common phonological process in the Amharic language, which predominantly takes place contiguously and mainly at word or morpheme boundaries, hence mainly morphophonemic in nature. The paper discusses different types of assimilation processes, such as voice assimilation, glottalization, palatalization, nasalization, and vowel rising, and provides ample examples from the language to illustrate these processes. The paper also discusses the role of feature specification, underspecification, and morphophonemic process in the phonological structure of the language. Overall, the paper provides a detailed analysis of the phonological processes of assimilation in the Amharic language, and sheds light on the phonological structure of the language.

The contributions of this paper are as follows.

- The paper provides a detailed analysis of the phonological processes of assimilation in the Amharic language.
- The paper explains how assimilation predominantly takes place contiguously and mainly at word or morpheme boundaries, hence mainly morphophonemic in nature.
- The author discusses different types of assimilation processes such as voice assimilation, glottalization, palatalization, etc. and provides ample examples from the language.
- The paper describes how most of the values in the language are predicted on the basis of other features under Combinatorial Specification and Radical Underspecification.
- The paper also describes the patterns of units of phonological analysis in Amharic, which occur in particular regular patterns that need to be discovered for each language.
- The paper provides a comprehensive understanding of the feature specification, morphophonemic process, and feature geometry of the Amharic language.
- The findings of this paper can be used to improve the understanding of the phonological processes of assimilation in the Amharic language.
- The paper can be used as a reference for further research on the phonology of the Amharic language.
- The paper contributes to the field of linguistics by providing insights into the phonological processes of assimilation in a less-studied language.
- The paper highlights the importance of studying the phonology of different languages to gain a better understanding of the diversity of human language.

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