A Descriptive Study of Hindko Segmental Features

Muhammad Nawaz
Ayaz Afsar

Abstract

This study describes the consonantal and vocalic features of Hindko spoken in Khyber Pakhtoonkhawa, Pakistan. The data were collected from twelve native speakers. First, Hindko phonemic inventory was established through articulatory phonetics and then verified the phonemes by acoustic phonetics which gave more valid results. The identified Hindko consonants and vowels are described in form of distinctive features. These features are like a checklist in form of plus (+) value and minus (-) value. Plus values show that sounds have distinctive features and minus values refer to negation of the distinctive features in the phonemes. In this manner, the identity of each sound has been marked as place of articulation, manner of articulation and voicing features for Hindko consonants. Similarly, the vocalic features of Hindko have been described as high vowels, low vowels, back vowels, round vowels and tense vowels. This description of Hindko consonants and vowels in form of distinctive feature matrices may make the language to be part of the well documented languages of the world.

Keywords: Hindko, consonants, vowels, articulatory, acoustic, phonetics

1. Introduction

Hindko is the second major language spoken in Khyber Pakhtunkhawa (KP) province of Pakistan. It is also spoken in some parts of Punjab and Azad Jammu and Kashmir (AJK). According to Rahman (2002), Hindko is spoken by 2.5 % population of Pakistan. It has various dialects which are different from one another in terms of vocabulary and syntactical structure; however, the phonemic inventories of all the dialects are almost same. The first systematic study was carried out by Awan in (1974) and (2004) respectively describing the consonants and vowels of Hindko on articulatory basis. The data were based on the researcher's knowledge as the native speaker of Hindko. He identified 35 consonants, out of which, 16 oral stops have four place of articulation including bilabial, dental, alveolar and palatal; and the four affricates have alveolar place articulation. Each place of articulation of stops and affricates has two unaspirated, one aspirated and one voiced sound. Awan's studies show that Hindko three nasals are articulated through bilabial, dental and retroflex places. The eight Hindko fricatives are uttered through bilabial, dental, palatal, velar and glottal positions. The four approximant of Hindko sounds are uttered at three place of articulation including lateral, retroflex and palatal.

Awan's (2004) study exhibits nine oral vowels, out of which, three vowels are short /a/, /i/, /u/ and six vowels are long vowels, /a:/, /Æ/, /e/, /i:/, /o:/, /u:/. He established Hindko vowels inventory on the basis of articulatory phonetics; nevertheless, he recommends that the vowels inventory should be carried out through machine analysis (p.71). Another study was carried out by Haroon ur Rashid (2011) and he identified nine oral vowels on the basis of acoustical measurements. In addition to vowels, he (2015) identified 30 Hindko consonants. However, the present study established Hindko phonemic inventory in terms of articulatory and acoustic phonetics; thus, it gives a very comprehensive view of Hindko segmental features. This study is carried out making Hindko to be part of the well described and well documented languages of the world both phonetically and acoustically as most of the world languages have gone through this process.

2. Literature Review

A phoneme is a composition of various features. Since years, these features with various names are commonly used by linguists for the description of speech sounds such as acoustic features, phonetic features and distinctive features etc. The works of Jakobson and Halle (1956) show the sound features as distinctive features, Chomsky and Halle (1968) name them as articulatory features and Fant (1973) indicates as acoustic features and so on.

According to Ashby and Maidment (2005), distinctive features are like a checklist that gives phonetic description of a phoneme. This list gets a binary nature which reflect the values in form of plus (+) and minus (-). Plus values (+) indicates that a segment has distinctive feature while minus value (-) directs that a segment has no distinctive feature. Thus, each phoneme has its own identity, e.g., /t/ and /d/ are different phonemes in terms of voicing and /t/ sound is marked as (-) values as it is a voiceless sound that brings about the negation of distinctive feature; however, (+) value is placed for /d/ as it's a voiced sound that allows distinctive feature. Other features of both /t/ and /d/ sounds are similar including manner and place of articulation.

Furthermore, Cruttenden (2001) states that the distinctive feature matrices explain all the contrasts of a language having around 12 to 13 distinctions (e.g. voicing, coronal, sonorant etc.) and these are common for all the languages. Clark, et al. (2007) claims about the use of sound features, "Features are not uncontroversial labels for objective characteristics of speech but may be used in various ways to indicate the nature, status and functions of sounds within a linguist system" (p.373). There are many other works which show relative description of sound features such as Giegerich (1992), Gussenhoven and Jacobs (1998), Ladefoged (2006) and Davenport and Hannahs (2010) etc. Davenport and Hannahs (2010) categorize the features of sounds as a major class features such as consonantal features, place features (anterior, coronal), manner features (continuant, nasal, strident, lateral and delayed release) and vocalic features.

In the present study, the distinctive features are applied on Hindko sounds due to the binary nature, (+) value and (-) value. An overview of the distinctive features, such as syllabic, consonantal, sonorant, voiced, anterior, coronal, continuant, nasal, strident, lateral and delayed release (Davenport & Hannahs, 2010, p. 94), is given in the following:

Syllabic: Syllabic feature deals with the syllabic and non-syllabic sounds. The syllabic sounds are distinguished from non-syllabic segments which occur as nucleus in a syllable, e.g. vowels are the syllabic sounds. In major class features, [+/- syllabic] differentiates vowels from other phonemes. [+syll] sounds do function as a nucleus and [-syll] sounds do not function as a nucleus of a syllable.

Consonantal: The features of consonant refer to the sounds those are uttered with the obstruction of air including obstruents, liquids and nasals. In major class features, [+/- consonant] discerns consonants from vowels. Therefore, [+consonant] denotes consonantal sound and [- consonant] symbolizes non-consonant sounds like vowels.

Sonorant: The feature of sonorous sounds allows nasals, liquids, glides and vowels to distinguish from non-sonorous sounds such as fricatives, affricates and stops. In major class features, [+/- sonorant] separates vowels, glides, liquids and nasals from oral stops, affricates and fricatives.

Thus, [+sonorant] refers to vowels, glides, liquids and nasals while [-sonorant] directs towards oral stops, affricates and fricatives.

Voiced: The feature of voicing acts towards the articulation of sounds related to glottal setting with vocal-fold vibration. Generally, consonants are further classified as a voicing feature [+/- voice]. [+voice] consonants are articulated with vibration of vocal cords while [-voice] consonants are produced without vibration of vocal cords. The description of place features is given in the following:

Anterior: The anterior feature deals with the sounds those are produced in front part of the hard palate. [+ant] segments are articulated at or in front of alveolar ridge and [-ant] sounds are uttered back in the oral cavity than the alveolar ridge.

Coronal: This place of articulation feature refers to the segments those are articulated with the blade of the tongue raising above its neutral position. [+cor] deals with the sounds those are produced with tip of tongue whereas [-cor] sounds are articulated without front part of tongue. In addition to the above mentioned place feature of consonants, the description of manner features is given in the following:

Continuant: The feature of continuant refers to the sounds those are produced with free airflow in the oral cavity. [+cont] sounds are articulated with free airflow through the oral cavity and [-cont] sounds are uttered through stopping the airflow in the oral cavity.
Nasal: The feature of nasal deals with the sounds which are articulated with a lowered velum allowing the air stream to escape through the nasal cavity. [+nas] sounds those are uttered with a lowered velum and [-nas] sounds are articulated without air flow through nasal cavity.

Strident: Sounds which make frication during articulation. [+ strid] sounds are produced with a noisy or hissing airflow and [-strid] sounds do not involve such constriction.

Lateral: This feature is about the sounds those are articulated with the air obstruction in the central part of oral cavity and then the obstructed air is released on either side of the tongue. [+ lat] sounds those are produced with central oral obstruction and airflow gets out from one side or both sides of tongue and [-lat] sounds articulated without central oral obstruction and airflow passing over the either side of tongue.

Delayed release: The feature of delayed release refers to the sounds which are produced through the stop closure and frication. [+del rel] sounds those have involvement of stop closure followed by frication and [-del rel] refer to all other sounds.

The vocalic feature of vowels including height, backness, roundedness and length are set out in the following. The works of many linguists depict the description of vowel qualities in terms of binary features. In this regard, Ashby and Maidment (2005) indicate that in addition to class feature, i.e., syllabic and consonantal, the major features of vowels are /+/- high/, /+/- low/, /+/- back/, /+/- round/ and /+/- tense/. They also state that it is obvious, segments which have neither high nor low position in the vowel space, would be the middle sound. Davenport and Hannahs (2010) describe high, low, back, front, round and tense features for vowels, such as high vowels [+ hi] get involve

the body of the tongue raised above the neutral position and in [- hi] vowels, the tongue position is not raised.In the articulation of low vowels [+ lo], the tongue position is lowered and during [- lo] vowels, the tongue position is not lowered. During the utterance of back vowels [+ back], the body of tongue is retracted from the neutral position, and the [-back] vowels are those in which the tongue is not retracted. During the articulation of the front vowels [+ front], the position of tongue is fronted from the neutral position, and in the articulation of [-front] vowels, the tongue is position is not fronted. Round vowels [+ rnd] are uttered through rounding lips, and [-rnd] vowels are articulated with neutral or spread lips. Tense vowels [+ tns] get involve the constriction of the body of tongue and [- tns] vowels are not required the constriction of the tongue.

3. Methodology

The data in form of minimal pairs, contrastive distribution, voicing features, vowel-consonant-vowel (VCV) context, consonant-vowel-consonant (CVC) pattern were collected from 12 native speakers (6 males and 6 females) for articulatory and acoustic analyses of Hindko sounds. All the speakers were above 50 years of age and had never been to school so that the uninfluenced data would be the result of the effort. First, the data were collected for articulatory phonetics and analysed in terms of minimal pairs, contrastive distribution, and voicing features. Then, the data were collected for the acoustic analysis and the recordings were made in 'Pratt' software. The word lists, comprising three tokens for each sound, were recorded in an intervocalic pattern VCV for consonants and CVC for vowels. All token words were monosyllabic, the consonantal data were preceded and followed by vowel /a/, e.g., apa, aba, ata, aga, ana and ama etc and the vowels data were preceded by /t/ and followed by /p/, e.g., teep, tip, tap, taap and top etc. The data were analyzed in Pratt software for verifying the established Hindko phonemes on the basis of articulatory phonetics (see Section, 4).

4. Data Analysis

This section shows the description of Hindko segmental features as consonants and oral vowels; however, an overview of the data and results is given in the following before providing the detail of the features. First, the collected data were analysed through articulatory phonetics in terms of minimal pairs, contrastive distribution and voicing features, and found that Hindko has 31 consonants and nine oral vowels. Then, the recorded data were analysed through acoustic phonetics using Praat software and established the systematic phonemic inventory of Hindko. Some of the sounds like /ʒ/ seemed to be the part of Hindko phonemic inventory on the articultory basis; however, after the acoustic analysis, it was found that they were not the separate phonemes of Hindko, thus, excluded from the inventory.

The results show that out of 31 Hindko consonant, there are 26 unaspirated and 5 aspirated sounds including 12 stops, /p/, /b/, /pʰ/, /ʈ/, /ɖ/, /ʈʰ/, /t/, /d/, /tʰ/, /k/, /g/, /kʰ/; 4 nasals /m/, /n/, /ŋ/,/ɳ/; 8 fricatives, /f/, /v/, /s/, /z/, /ʃ/, /x/, /ɣ/, /ɦ/; 3 affricates, /tʃ/, /dʒ/, /tʃʰ/; and 4 approximants, /l/, /r/, /ɽ/, /j/. These consonants are tabulated in the following in form of phonetic features those that correspond to physical articulatory or acoustic events.

4.1 Hindko Consonantal Features

The phonetic features of Hindko consonants are described in terms of the voicing features [+/- voice]; the place features, coronal [+/- cor] and anterior [+/-ant]; and the manner features,

continuant [+/-cont], nasal [+/-nas], strident [+/-strid], lateral [+/-lat] and delayed release [+/-del rel].

Table 4.1:**Hindko Consonantal Features**

Hindko Place Features				Hindko Manner Features																			
[cor]				[ant]				[cont]				[nas]				[strid]				[lat]				[del rel]			
Features	Voiceless	Voiced		Features	Voiceless	Voiced		Features	Voiceless	Voiced		Features	Voiceless	Voiced		Features	Voiceless	Voiced		Features	Voiceless	Voiced		Features	Voiceless	Voiced
+		j		−		j		+		j		-		j		+		j		-		j		-		J
-		l		+		l		+		l		-		l		+		l		+		l		-		l
-		r		+		r		+		r		-		r		+		r		-		r		-		r
-		ɽ		-		ɽ		+		ɽ		-		ɽ		+		ɽ		-		ɽ		-		ɽ
-		m		+		m		-		m		+		m		-		m		-		m		-		m
-		ŋ		-		ŋ		-		ŋ		+		ŋ		-		ŋ		-		ŋ		-		ŋ
+		n		+		n		-		n		+		n		-		n		-		n		-		n
-		ɳ		-		ɳ		-		ɳ		+		ɳ		-		ɳ		-		ɳ		-		ɳ
+	s	z		+	s	z		-	s	z		-	s	z		+	S	z		-	s	z		-	s	Z
+	ʃ			+	ʃ			-	ʃ			-	ʃ			+	ʃ	dʒ		-	ʃ			-	ʃ	
-	tʃ	dʒ		+	tʃ	dʒ		-	tʃ	dʒ		-	tʃ	dʒ		+	tʃ			-	tʃ	dʒ		+	tʃ	dʒ
+	$t\underline{ʃ}^h$			+	$t\underline{ʃ}^h$			-	$t\underline{ʃ}^h$			-	$t\underline{ʃ}^h$			+	$t\underline{ʃ}^h$			-	$t\underline{ʃ}^h$			-	$t\underline{ʃ}^h$		
+	ʈ	ɖ		+	ʈ	ɖ		-	ʈ	ɖ		-	ʈ	ɖ		+	ʈ	ɖ		-	ʈ	ɖ		-	ʈ	ɖ
+	$ʈ^h$			+	$ʈ^h$			-	$ʈ^h$			-	$ʈ^h$			+	$ʈ^h$			-	$ʈ^h$			-	$ʈ^h$		
+	t	d		+	t	d		-	t	d		-	t	d		-	t	d		-	t	d		-	t	d
+	t^h			+	t^h			-	t^h			-	t^h			-	t^h			-	t^h			-	t^h		
-	p	b		+	p	b		-	p	b		-	p	b		-	p	b		-	p	b		-	p	b
-	p^h			+	p^h			-	p^h			-	p^h			-	p^h			-	p^h			-	p^h		
-	k	g		-	k	g		-	k	g		-	k	g		-	k	g		-	k	g		-	k	g
-	k^h			-	k^h			-	k^h			-	k^h			-	k^h			-	k^h			-	k^h		
-	f	v		+	k	v		-	f	v		-	f	v		+	f	v		-	f	v		-	k	v
	ɦ			-	k^h			-	ɦ			-	ɦ			+	ɦ			-	ɦ			-	k^h	
				-	f																			-	f	
				-	ɦ																			-	ɦ	

The analysis of the data shows that Hindko has 31 consonants which are distinguished in smaller groups of sounds. First, voicing features [+/- voice] of consonants are discussed with reference to vibration [+] and non-vibration [-] of vocal cords during the production of sounds. Hindko has seventeen voiced [+voi] sounds, /b/,/$\underline{ɖ}$/, /d/, /g/, /m/, /n/, /ŋ/, /ɳ/, /dʒ/, /v/, /z/, /ɣ/, /ɦ/, /j/, /ɽ/, /r/, /l/ and fourteen voiceless [-voi] sounds, /p/, /p^h/, /$\underline{ʈ}$/, /$\underline{ʈ}^h$/, /t/, /t^h/, /k/, /k^h/, /f/, /s/, /ʃ/, /x/, /tʃ/, /$tʃ^h$/.

Place features refer to the place of articulation from dental to velar part of oral cavity, i.e. horizontal form of vocal tract. It involves two main features [+/- coronal], [+/-anterior] and four

natural classes, labials; dentals and alveolars; palato-alveolars/palatals and retroflex; and velars and glottals. Hindko coronal sounds [+cor], using tip of the tongue or the tongue blade raised, are

/ʈ/, /ɖ/, /ʈʰ/, /t/, /d/, /tʰ/, /n/, /ɳ/, /tʃ/, /dʒ/, /tʃʰ/, /s/, /z/, /ʃ/, /ɽ/, /r/, /l/, /j/, and non-coronal sounds [-cor] are /p/, /b/, /pʰ/, /k/, /g/, /kʰ/, /m/, /ŋ/, /f/, /v/, /x/, /ɣ/, /ɦ/. Hindko anterior sounds [+ant], articulating sounds in the front part of mouth, are /p/, /b/, /pʰ/, /ʈ/, /ɖ/, /ʈʰ/, /t/, /d/, /tʰ/,/m/, /n/, /tʃ/, /dʒ/, /tʃʰ/, /f/, /v/, /s/, /z/, /r/, /l/ and Hindko non-anterior sounds [-ant], producing through the back part of the oral cavity starting from alveolar ridge, are /k/, /g/, /kʰ/, /ŋ/, /ɳ/, ,/ʃ/, /x/, /ɣ/, /ɦ/, /ɽ/, /j/. These sounds are further distinguished in light of four natural classes of segments, such as Labials: [-cor, +ant]: [p, b, pʰ, m, f,v]; Dental/ Alveolars: [+cor, +ant]: [ʈ, ɖ, ʈʰ, n, t, d, tʰ, s, z, l]; Palato-Alveolars/Palatals/Retroflex: [tʃ, dʒ, tʃʰ, ɽ, ɳ, j, ʃ]; Velar/Glottal: [-cor, -ant]:[k, g, kʰ, ŋ, ɦ].

The manner features of Hindko consonants are presented in the following section such as [continuant], [nasal], [strident], [lateral] and [delayed release]. Hindko continuant sounds [+cont], producing with free airflow through the oral cavity, are [f, v, s, z, ʃ, x, ɣ, ɦ, l, r, ɽ, j] and the non-continuant sounds [-cont], stopping the air flow in the oral cavity during the articulation, are [p, b, pʰ, ʈ, ɖ, ʈʰ, t, d, tʰ, k, g, kʰ, m, n, ŋ, ɳ, tʃ, dʒ, tʃʰ].

Hindko nasal sounds [+nas], uttering with the velum lowered and allowing the air through nose, are [m, n, ŋ, ɳ] and the non-nasal sounds [-nas], producing without airflow through the nasal cavity, are [p, b, pʰ, ʈ, ɖ, ʈʰ, t, d, tʰ, k, g, kʰ, tʃ, dʒ, tʃʰ , f, v, s, z, ʃ, x, ɣ, ɦ, l, r, ɽ, j].

Hindko strident sounds [+strid], a constriction during the utterance results hissing airflow, are [f, v, s, z, ʃ, x, ɣ, ɦ, tʃ, dʒ, tʃʰ] and Hindko non-strident sounds [-strid], producing sounds without constriction that results hissing airflow, are [p, b, pʰ, ʈ, ɖ, ʈʰ, t, d, tʰ, k, g, kʰ, m, n, ŋ, ɳ, l, r, ɽ, j].

Hindko lateral sound [+lat], in which articulation occurs with the central oral obstruction and airflow through either side of the tongue, is [l] and Hindko non-lateral sounds, refer to other sounds which are produced without the central oral obstruction in the oral cavity, are [p, b, pʰ, ʈ, ɖ, ʈʰ, t, d, tʰ, k, g, kʰ, m, n, ŋ, ɳ, tʃ, dʒ, tʃʰ , f, v, s, z, ʃ, x, ɣ, ɦ, r, ɽ, j].

The last manner feature of the phonemes is delayed release, [+ del rel], in which sounds are produced with the stop closure and then immediately release of the airflow with friction in the oral cavity, and Hindko has three sounds [tʃ, dʒ, tʃʰ] while Hindko [-del rel] sounds, producing without the preceding given articulation method, are [p, b, pʰ, ʈ, ɖ, ʈʰ, t, d, tʰ, k, g, kʰ, m, n, ŋ, ɳ, f, v, s, z, ʃ, x, ɣ, ɦ, l, r, ɽ, j]. The summary of features specification for Hindko consonants is given in Figure 4.1.

Distinctive Features	Features	Hindko Consonants																												
		p	b	pʰ	ʈ	ɖ	ʈʰ	t	d	tʰ	k	g	kʰ	m	n	ɳ	ŋ	ʧ	ʤ	ʧʰ	f	v	s	z	ʃ	x	ɣ	ɦ	r	ɽ	j	l
Syllabic	Major classes	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
Consonantal		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sonorant		-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+
Voiced	Voi	-	+	-	-	+	-	-	+	-	-	+	-	+	+	+	+	-	+	-	-	+	-	+	-	-	+	+	+	+	+	+
Anterior	Places	+	+	+	+	+	+	+	+	+	-	-	-	+	+	-	-	+	+	+	+	+	+	+	-	-	-	-	+	-	-	+
Coronal		-	-	-	+	+	+	+	+	+	-	-	-	-	+	+	-	+	+	+	-	-	+	+	+	-	-	-	+	+	+	+
Continuant	Manner features	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+
Nasals		-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Strident		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-
Laterals		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
Delayed release		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-

Figure 4.1:**Distinctive feature specifications for Hindko consonants**

The data reflect Hindko has three syllabic consonants, /m/, /ɳ/ and /l/ and all other 31 sounds in the figure show plus [+] values referring to consonants followed by sonorous sounds and these three features are termed as major classes feature of Hindko. The second part of distinctive features refers to the voicing feature, the third part is about the place features and the last part of distinctive features gives description of manner features.

4.2 Hindko Vocalic Features

Like Hindko consonants, the vowels were also identified on the basis of articulatory phonetics and found nine vowels, /i:/, /ɪ/, /e:/, /æ:/, /a/, /a:/, /o:/, /ʊ/, /u:/ and then the identified vowels were verified through acoustic phonetics. The phonetic features of these vowels are dealt in the following section in form of height, backness, length and roundedness. At micro level, these vowel features are further categorized and indicated as high /+/- hi/; low /+/- lo/; back /+/- back/; front /+/- front/; round /+/- rnd/; and tense /+/- tns/.

Table 4.2:**Hindko Vocalic Features**

[high]		[low]		[back]		[front]		[round]		[tense]	
Features	owels	eatures	owels	eatures	owels	eatures	owels	eatures	owels	eatures	owels
+	i:	-	i:	-	i:	+	i:	-	i:	+	i:
+	ɪ	-	ɪ	-	ɪ	+	ɪ	-	ɪ	-	ɪ
+	e:	-	e:	-	e:	+	e:	-	e:	+	e:
+	u:	-	u:	+	u:	-	u:	+	u:	+	u:
-	æ:	-	æ:		æ:	+	æ:		æ:	+	æ:
-	a:	+	a:		a:	-	a:		a:	+	a:
	a	+	a		a	-	a		a	-	a
-	o:	-	o:	-	o:	-	o:	+	o:	+	o:
-	ʊ	-	ʊ	-	ʊ	-	ʊ	+	ʊ	-	ʊ

Table 4.2 exhibits the binary features of Hindko vocalic part. The plus and the minus values (+/-) reflect the existence and non-existence of the feature in the sounds. It shows that Hindko four vowels carry high place in the vowel space [i:, ɪ, e:, u:], two vowels get low positions [a:, a], three vowels are articulated at the back part of mouth [u:, o:, ʊ],four sounds are uttered at the front part of oral cavity [i:, ɪ, e:, æ:], lips position are get rounded for three segments [u:, o:, ʊ] and six are tense sounds [i:, e:, u:, æ:, a:, o:, ʊ]. The summary of Hindko vowel matrix is given in Figure 4.2.

Features	Hindko vowels								
	/i:/	/ɪ/	/e:/	/æ:/	/a:/	/a/	/o:/	/ʊ/	/u:/
Syllabic	+	+	+	+	+	+	+	+	+
Consonantal	-	-	-	-	-	-	-	-	-
High	+	+	+	-	-	-	-	-	+
Low	-	-	-	-	+	+	-	-	-
Back	-	-	-	-	-	-	+	+	+
Front	+	+	+	+	-	-	-	-	-
Round	-	-	-	-	-	-	+	+	+
Tense	+	-	+	+	+	-	+	-	+

Figure 4.2: **Distinctive features specification for Tanoli Hindko vowels**

The figure displays that all vowels are syllabic and the second row shows minus values that refer to non-consonantal feature of the sounds. Two sounds, /a:/ and /a/, have minus values for both back and front features meaning that they are central sounds. Similarly, /æ:/, /o:/ and /ʊ/ sounds have minus values for low and high features representing that they are middle sounds.

5. Conclusion

Out of 31 Hindko consonants, three are syllabic and other 28 consonants are non-syllabic. Eight consonant sounds are sonorous, that is, four nasals and four approximants. Voiced consonants are 17 including four stops, four nasals, four approximants, one affricate and four fricatives. Unaspirated consonants are nine such as four stops, one affricate and four fricatives and aspirated consonants are five, i.e., four stops and one affricate. According to the place features, the anterior consonants are 28, articulated at front part of the hard palate, the coronal sounds are 18, produced with the blade of the tongue. In relation to the manner features, the continuant sounds are 12 including eight fricatives and four approximants which are uttered with free air flow in the oral cavity. The nasal sounds are four which are articulated with lowering the velum. The strident segments are 11, three affricates and eight fricatives, which have the involvement of frication in the articulation. The delayed release sounds are three affricates, uttered with delayed release that refers to frication and closure of air. Hindko has nine vowels, which, of course, are syllabic sounds. Out of nine Hindko vowels, four are high vowels, two are low vowels, three are back vowels, four are front vowels, three are round vowels and six are tense vowels.

References

Ashby, M., & Maidment, J. (2005).*Introducing phonetic science*. Cambridge: Cambridge University Press.

Awan, E. B. (1974). *The phonology of verbal phrases in Hindko*.PhD, University of London.

Awan, E. B. (2004). *Hindko sautiyat*. Peshawar: Gandhara Hindko Board.

Chomsky, N., & Halle, M. (1968).*The sound pattern of English*. New York: Harper and Row.

Clark, J. E., Yallop, C., & Fletcher, J. (2007).*An introduction to phonetics and phonology* (3rd ed.). Malden: Blackwell.

Cruttenden, A. (2001). *Gimson's pronunciation of English* (6th ed.). London: Arnold.

Davenport, M., & Hannahs, S.J. (2010).*Phonetics and phonology* (3rd ed.). London: Hodder.

Fant, G. (1973). *Speech sounds and features*. Cambridge MA: MIT Press.

Giegerich, H. J. (1992). *English phonology; An introduction*. London: Cambridge University Press.

Gussenhoven, C., & Jacobs, H. (1998).*Understanding phonology*. London: Arnold.

Haroon ur Rashid (2011). *The phonology of English loanwords in Hindko: Vehicle register.* MPhil, University of Azad Jammu & Kashmir, Pakistan.

Haroon ur Rashid (2015). *Syllabification and Stress Patterns in Hindko.*PhD, University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan.

Jakobson, R. & Halle, M. (1956). *Fundamentals of language*. The Hague: Mouton.

Ladefoged, P. (2006). *A course in phonetics* (5th ed.). Boston, MA: Thomson Wadsworth.

Rahman, T. (2002).*Language teaching and power in Pakistan*. Paper presented at the world congress on language policies. 16-20, April. Barcelona.