

With best regards from

the author.

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Shri C. A. Allana, London.

Dr. S. S. S. S. S.
Puna. 12/1/63.

The Phonology and Morphophonemics
of Sindhi

Lachman Mulchand Kumbhandani

"A thesis
in Linguistics
presented to the Faculty of the
Graduate School of the University of
Pennsylvania in partial fulfillment of
the requirements for the degree of
Master of Arts."

1961

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0. Introduction.

0.0. Sindhi is an Indic language spoken in Sind and Las Bela (Baluchistan) regions of West Pakistan and Kutch (Gujrat) and some parts of N.W. India. It belongs to the North-West group of Indo Aryan languages and shows some relationship to Dardic and Iranian languages.

0.1. Sindhi is subdivided into six major dialects^{*1}

- (1) Siro or Sirāiki (in the Northern part of Sind)
- (2) Vicoli (in the Central part of Sind)
- (3) Lāri (in the Southern part of Sind)
- (4) Lāsī (in Las Bela State and Kirthar Range on the Western border of Sind)
- (5) Thari or Thareli (in the Eastern part of Sind and Sind-Rajasthan border areas)
- (6) Kacchi (in the Kutch region of Gujrat State on the Southern border of Sind).

In 1947, at the time of the partition of India, about 0.8 million Sindhi speakers (belonging to first five dialects) migrated from Sind and Las Bela states and are at present spread all over N.W. India with main concentration in Gujrat, Maharashtra, Rajasthan and Delhi states. In both countries - Pakistan and India - there are about 6.0 million speakers of Sindhi. According to the 1951 Census Report of Pakistan about 4.7 million have reported Sindhi as their mother tongue. And in the 1951 Census of India about 0.75 million persons have reported Sindhi as their mother tongue and about 0.4 million have reported Kacchi as their mother tongue.^{*2}

*1. Grierson, (Sir) George, Linguistic Survey of India, vol. I Part I, pp. 138

*2. Although linguistically Kacchi is a dialect of Sindhi and the 'Standard Dialect' of Sindhi is intelligible to a Kacchi speaker, but because of political and social separation, he does not make effort to imitate the prestige dialect of Sindhi and considers himself closer to a Gujrati speaker

Sindhi is surrounded by Balochi (an Iranian language) and Brāhmī (a Dravidian language) on the West; Balochi and Multani (a Lahandā dialect) on the North; Bahawalpuri (a Lahandā dialect) on the North-East; Mārwarī (a Rajasthanī dialect) on the East, and Gujrātī on the South. In India, almost all Sindhi immigrants live in bi-lingual or multi-lingual atmosphere of Hindi, Gujrati, Marathi, Rajasthanī or Panjabi.

- 0.2. In literature, Sindhi has made a valuable contribution of Sūfī (Mystic) poetry during the 17th - 19th centuries. After 1947, there has been remarkable progress in modern poetry, short stories, novels and dramas. In the 19th century, Sindhi writings are found in two scripts - Arabic as well as Devanagiri. The use of Gurmukhi script has also been noticed among certain sections of people. In 1849, Capt. Stack published the first dictionary from English to Sindhi in Devanagiri script. In 1858, A. Burn translated the Gospel of St. John into Sindhi in Arabic script, and in 1859 its Gurmukhi version was also published. In the later part of the century, a modified form of Arabic script got official recognition. After the partition of the country, attempts have been made in India to revive the Devanagiri script for Sindhi. At present both - Arabic and Devanagiri - scripts are taught in schools.

Prinsep (1835), Wathen (1836), Eastwick (1843), and Capt. Stack (1849) have made attempts to write the grammar of Sindhi. But the first detailed grammar based on philological comparisons with Sanskrit and Prakrit was written by E. Trumpp in 1872. Later Grierson has surveyed all dialects of Sindhi in the Linguistic Survey of India (vol. VIII pt. 1) published in 1919. Other works on the language by native and European scholars have been listed chronologically in appendix I.

- 0.3. Sources: The variety of Sindhi described here fairly represents the 'Vicoll dialect'. It is considered as the 'Standard' dialect used in the speech of the educated class and in literature. The description is based on the speech

*3. of the writer. Apart from using myself as an informant, I have observed the speech of some Sindhi speakers I met in this country, as well as other Sindhi speakers of different dialects when I have worked on the language in India. I have kept the description very close to the colloquial speech and have largely refrained from using written texts. Although multi-lingual myself, I am quite aware of the pronunciation of the mono-lingual speaker of Sindhi and have tried to include only such borrowings from Sanskrit, Persian, Arabic and English where the native speaker is not aware of the items being borrowed.

The scope of the inquiry is limited to the "synchronic description of Phonology and Morphophonemics of Sindhi", though for practical reasons I have made some references to the morphology and historical developments of the language at certain points.

*3. The writer is a native speaker of the Vicoli dialect, received his early education in Karachi (Sind), left Sind at the age of 16 years, and received higher education in Delhi after migrating from Pakistan in 1947.

1.0. Inventory of segmental phonemes:

The segmental phonemes of Sindhi are as follows:

1.1. Consonants

	Bilabial	Labio-dental	Alveolar	Alveopalatal (Retroflex)	Palatal	Velar	Glottal
<u>STOPS</u>							
<u>Explosives:</u> *l vl. un- p			t	ʈ	c	k	
asp.							
vl. asp. ph			tʰ	ʈʰ	cʰ	kʰ	
vd. un- b			d	ɖ	j	g	
asp.							
vd. asp. bʰ			dʰ	ɖʰ	jʰ	gʰ	
<u>Implosives:</u>	ɓ		ɗ	ɗʱ	ɟ	ɟʱ	
<u>NASALS</u>	m		n	ɳ	ɲ	ŋ	
<u>FRICATIVES</u>			f	s	ʃ	x	
vl.							
vd.			z			χ	
<u>LATERAL</u>			l				
<u>VIBRANTS</u>			r	ɽ			
<u>SEMI-CONSONANTS</u>	w				y		h

1.2. Vowels:

	Front	Central	Back
High	i		u
Lower-High	ɪ		ʊ
Higher-Mid	e		o
Mid		ə	
Lower-Mid	ɛ		ɔ
Low		a	

*l.vl. = voiceless; vd. = voiced; asp. = aspirated; unasph = unaspirated

Front and Central vowels are unrounded and Back vowels are rounded.

These vowels are phonetically and structurally divided into two classes. Class 1 consists of Lower-High /I U / and Mid /e/ vowels which are phonetically short, and Class 2 consists of the remaining vowels which are phonetically long. These two classes can be graphically represented as

<u>Class 1</u>	<u>Class 2</u>
I e U	i u
	e o
	ɛ ɔ
	a

In the class 1 system, there is a three-fold contrast in the tongue position, front, central and back, whereas in the class 2 system, there is a four-fold contrast in the tongue-height: High, Higher-Mid, Lower-Mid and Low, and a two-fold contrast between front and back, ^{tongue-position} except in the case of the lowest vowel /a/.

2.0 Consonants.

Sindhi has 38 consonant phonemes and three semi-consonants. Two kinds of phonemic contrasts have been illustrated in this section: 1) contrast between those phonemes which are phonetically and distributionally comparable, 2) contrast between a phoneme and its absence.

2.1. Contrasts.

2.1.1. Contrast between comparable phonemes:

2.1.1. (a) phonemes showing contrast in the manner of articulation:

/p b ɓ p^h b^h m f w/:

/pəru/ 'leaf', /boɪru/ 'sweet bread', /ɓəru/ 'a curse', /p^həru/ 'hood',
/b^hənəru/ 'loud lamentation', /məru/ 'mind', /fəru/ 'skill', /wəru/ 'trees'.

/t d t^h d^h n s z l r/:

/təru/ 'bottom', /dəru/ 'door', /t^həru/ 'a district in Sind' (Pakistan), /d^həru/ 'trunk of the body', /nəru/ 'male', /səru/ 'funeral ceremony', /zəru/ 'gold, wealth', /ləru/ 'fight (imp.)', /rəru/ 'shout (imp.)' *1.

/t̪ d̪ t̪^h d̪^h ɳ r/:

/t̪^həɖo/ 'sour', /gəɖo/ 'dull (color)', /k̪^həɖo/ 'pit', /k̪ə^ho/ 'collected', /k̪ə^ho/ 'take out (imp.)', /k̪əno/ 'one rain', /k̪əro/ 'door-bolt'.

/c j ʃ c^h j^h ɳ ʃ y/:

/bəcu/ 'Be safe (imp.)', /jəju/ 'judge', /b^həʃu/ 'run (imp.)', /bəc^hu/ 'an attack', /wəj^hu/ 'opportunity', /b^həʃu/ 'break (imp.)', /kəʃu/ 'barley', /kəy^hu/ 'I did'.

*1. Abbreviations in the gloss:

Imp. - Imperative; obl. - oblique; M. (Masc.) = Masculine, F. (Fem.) = Feminine, Sg. - Singular, Pl. - Plural.

/k ɕ kʰ ʃ ɲ x ʎ h/:

/ʃeki/ 'suspicious', /beri/ 'horse-carriage', /sefi/ 'braid-tail',
/sekʰi/ 'girl-friend', /seʃʰi/ 'strong (f.)', /leŋi/ 'ill (f.)',
/saxi/ 'generous', /deʃa/ 'dec-it', /sehi/ 'correct, signature'.

2.1.1. (b) Phonemes showing contrast in the point of articulation

vl. explosives /p t ɕ k/:

/sipe/ 'mother-of-pearl', /cite/ 'mind (ool.)', /site/ 'line',
/vice/ 'center (obl.)', /sike/ 'longing'.

vd. explosives /b d ɖ j g/:

/bila/ 'remedies (Pl.)', /dila/ 'pitchers', /ɖiɕʰa/ 'long (Pl. etc.)',
/jiɕa/ 'importunate (fellow)', /gila/ 'defamation'.

implosives /ɓ ɗ ɟ ɠ/:

/ɓare/ 'children', /ɗare/ 'a crack (of wood)', /ɟare/ 'net', /ɠareɲu/ 'to melt'.

vl. asp. stops /pʰ tʰ ɕʰ kʰ/:

/pʰekəɲu/ 'to jerk (something) into the mouth', /tʰəpəɲu/ 'to flatten by patting', /ɕʰəpəɲu/ 'to stamp', /kʰəpəɲu/ 'to print', /kʰəpəɲu/ 'to need'.

vd. asp. stops /bʰ dʰ ɖʰ jʰ gʰ/:

/bʰurəɲu/ 'to crumble', /dʰuko/ 'guess', /ɖʰuko/ 'sips', /jʰurəɲu/ 'to be broken', /gʰurəɲu/ 'to demand'.

Nasals: /m n ɲ ñ ŋ/:

/kəɲu/ 'work', /kəɲu/ 'ear', /tʰəɲu/ 'test of an animal', /tʰəɲu/ 'mother's milk', /seɲu/ 'relationship'.

vl. fricatives /f s ʃ x/:

/faka/ 'hunger-fasts', /saʃa/ 'same (Pl.)', /ʃaxa/ 'branch', /xaka/ 'outlines'.

vd. fricatives /z ʃ /:

/bazu/ 'castle', /baʃu/ 'carden'.

vibrants /r ɾ/:

/kori/ 'weaver', /koɾi/ 'twenty'.

Semi-consonants /w y h/:

/waru/ 'hair', /yaru/ 'friend', /haru/ 'garland',

/sawa/ 'green (N.Pl.)', /saya/ 'shadows', /ɟaha/ 'wise (persons)'.

2.1.2. Contrast between a phoneme and its absence.

/p/ /paɬo/ 'belt', /eɬo/ 'flour'

/t/ /taɬo/ 'lock', /aɬo/ 'wet'

/t̪/ /roɬi/ 'meals', /roi/ 'having wept'

/c/ /kãɬu/ 'glass', /kãu/ 'crow'

/k/ /kano/ 'road', /ano/ 'one anna, etc'

/p^h/ /p^hɪki/ 'tasteless', /ɪki/ 'odd numeral'

/t^h/ /t^hindo/ 'will become', /indo/ 'will come'

/t̪^h/ /t̪^hahyo/ 'you (Pl.) built', /ahyo/ 'you (Pl.) are'

/c^h/ /c^hahe/ 'what is (it)?', /ahe/ '(it) is'

/k^h/ /ruk^ho/ 'plain, dry', /ruo/ 'you (Pl.) weep'

/b/ /benu/ 'forest', /enu/ 'grain'

/d/ /sadi/ 'simple (f.)', /sai/ 'green (f.)'

/ɖ/ /cedi/ 'diaper', /cei/ 'having said'

/j/ /jetro/ 'as much', /etro/ 'this much'

/g/ /gise/ 'scraping of nose
along the ground
as a punishment' /ise/ 'side stick of a cot'

/b^h/ /b^halo/ 'spear', /alo/ 'wet'

/d^h/ /d^hoti/ 'a garment', /oti/ 'poured (f.)'

- /d^h/ /ad^he/ 'having massaged', /ae/ 'coming'
- /j^h/ /koj^hi/ 'ugly (f.)', /koi/ 'someone'
- /g^h/ /soj^hi/ 'tight (f.)', /soi/ 'that one'
-
- /b/ /kub/ 'humpback (person)', /kub/ 'mouse'
- /d̥/ /d̥ad^he/ 'violence', /ad^he/ 'rubbing (with oil)'
- /f̥/ /saf̥/ 'right (hand)', /sao/ 'green'
- /f̥/ /rof̥i/ 'patient', /roi/ 'having wept'
-
- /m/ /mac^hi/ 'fish', /ec^hi/ 'write (f.)'
- /n/ /nano/ 'maternal grand-father', /naō/ 'ninth (Nsc.)'
- /ŋ/ /naŋ/ 'money', /nāo/ 'ninth (Nsc.)'
- /ñ/ /meñta/ 'obedience', /meta/ 'principles'
- /ɲ/ /señti/ 'friend', /seti/ 'truthful, pure (f.)'
-
- /f/ /ferzu/ 'duty', /erzu/ 'request'
- /s/ /mas̥/ 'meat', /maʋ/ 'mother'
- /š/ /šahi/ 'royal', /ahi/ 'trouble'
- /x/ /xali/ 'empty', /ali/ 'wet (f.)'
- /z/ /zemino/ 'land', /emino/ 'judges (Pl.)'
- /ʃ/ /ʃilm̥/ 'carpet', /ilm̥/ 'knowledge'
-
- /l/ /lesi/ 'plain', /esi/ 'eighty'
- /r/ /reŋʋ/ 'color', /eŋʋ/ 'numeral'
- /ɾ/ /muɾo/ 'you (Pl.) turn (Imp.)', /muo/ 'died'
-
- /y/ /sayo/ 'shadow', /sao/ 'green'
- /w/ /kewi/ 'cooking-spoon', /k-i/ 'many (persons)'
- /h/ /het^ha/ 'obstinacy, haughtiness (obl.)', /et^ha/ 'eight'.

2.2. Phonetic Description.

2.2.1. Implosive Stop Series /b d ɗ ɓ/.

All consonants, except Implosive Stops, are 'pulmonic pressure sounds', i.e. the bottom of the lung cavity is the back stop from which air is expelled outward across the articulating organs. But these implosive stops are 'glottalic suction sounds'. They are produced by the suction of the air from the mouth in, to the glottis, which produces rarefaction of air in the oral cavity between the larynx and the point of articulation.

Turner has called these sounds 'Recursives'^{*2} and has explained their articulation in this manner: "Immediately after the occlusion by lips or tongue and palate has been formed, the glottis also is closed. The larynx is lowered and there is considerable general muscular tension. The glottis is not opened until the lip or tongue occlusion has been broken, so that some air is sucked back to behind the point of occlusion. Then the glottis is opened to permit the formation of voice. It is possible that the glottis is again closed before the following vowel is pronounced."^{*3} Voicing is not a distinct feature of implosive. There is no contrast between voiced and voiceless implosives, or between aspirated and unaspirated implosives.

Early European grammarians, Prinsep (1835), Mathen (1836) and Eastwick (1843), did not differentiate the explosive and implosive stops. The existence of these sounds was first noticed by Stack (1855)^{*4}.

*2. R.L. Turner, The Sindhi recursives or voiced stops preceded by glottal closure. - Bulletin of the School of Oriental Studies, London vol. III 1923-25, pp. 301.

*3. But the acoustic tests of Sindhi implosive sounds reveal that the glottis remains open for the formation of voice before the occlusion of lip or tongue is broken.

*4. Sindhi-English Dictionary: Bombay, 1855.

His description of these sounds, denoted as g j d b, is quite interesting: "g has a strange sound, formed by placing the tongue against the palate, keeping the mouth open and sounding from the throat; j has a peculiar sound only to be acquired by practice; d is a harsh d --- sounded from palate and throat combined; b has a peculiar sound."

Later Trumpp (1861) also gave an interesting account of these sounds although he had difficulty in identifying explosive and implosive differences. "g is a peculiar hard g, that is difficult to describe; the speaker shuts his mouth and presses up a muffled sound (drückt einen dumpfen Laut herauf); then opens his mouth and lets out the sound g. This procedure is very like the cry (müßkern) of a goat or the bleat of a sheep.---- j is originally a double jj; but now it is treated as a single sound and pronounced as dy ---- d is a very hard cerebral d and is produced in the same way as g ---- b is pronounced in the same way as g and d".

Bailey (1922) was the first philologist to speak of them as "implosives" in which the breath is drawn instead of being expelled.

Spectrographic analysis:

The spectrographic analysis ^{*5} of a few nonsense syllables containing implosive and corresponding explosive stops indicates that the duration of the voicing of the implosive stop is much shorter than that of the corresponding explosive stop. But the implosive stop has much greater intensity or loudness than the corresponding explosive. Bordie (1958) while giving an acoustic description of Sindhi Implosives, has also come up with similar results. ^{*6}

-
- *5. Detailed acoustic study of explosive and implosive contrast in Sindhi is being pursued separately under the guidance of Dr. L. Lisker, University of Pennsylvania.
 - *6. J. G. Bordie, A Descriptive Sindhi Phonology, Ph.D. Thesis, University of Texas, 1958.

Historical Development.

Historically these implosives are later developments of Sanskrit voiced unaspirated stops /b (dv), d, ḍ, j(dy), g/ in initial position and corresponding geminate stops /-bb-, -dd-, -ḍḍ-, -jj-, -gg-/ which brought explosive and implosive stops in complementary distribution. But again with the change of Skt. v > Sd. b, Skt. y > Sd. j in certain positions and dissimilation of voiced aspirates before another aspirate or /h/ i.e. Skt. b^h ḍ^h j^h g^h > Sd. b ḍ j g and later reborrowing from Sanskrit and loans from Arabic and Persian, explosive stops /b ḍ j g/ became distinct phonemes in Sindhi. Turner in the same article, giving the historical account of the introduction of implosives in Sindhi, has estimated that this development could be between the time of Asokan inscriptions and 1st century A.D.

With the inclusion of implosive stop phonemes, Sindhi has the fullest stop system of any of the Indo-Aryan languages. Besides the contrast between pressure and suction, there is contrast between voicing and unvoicing and between aspiration and unaspiration in the stop series. There is a significant gap of dental implosive /ḍ/ in the system.

Implosives in other Indic Languages:

Another neighboring dialect of Lahandā - Multānī - also has the phonemic contrast between explosive and implosive stops. It has five voiced implosive phonemes /b ḍ ḍ̣ j ḡ/ (including dental implosive which is missing in Sindhi) and voiced aspirated implosive allophones [b^h ḍ^h ḍ̣^h j^h ḡ^h] in complementary distribution with voiced aspirated explosives /b^h ḍ^h ḍ̣^h j^h ḡ^h/. Some other neighboring dialects of Rajasthanī - Mewānī, Kārwarī - and some northern dialects of Gujarātī in the neighborhood of Kacchī also have bilabial voiced implosive /b/ in complementation or in free variation with the corresponding explosive stop /b/.

Different degrees of implosion have been noticed in Sindhi, Multani, Rajasthani and Gujrati. Phonetically Multani implosives are stronger than the corresponding implosives in Sindhi, and Rajasthani and Gujrati implosive /ɓ/ is milder than the Sindhi /ɓ/.

Besides an eastern dialect of Bengali (Dacca Bengali) also has implosive stop series /ɓ ɗ ɗ̣ ɗ̥/ which replaces voiced aspirated explosive stop series /b̥ d̥ ɗ̥/ of 'standard Bengali.' Turner has mentioned one Mongolian language spoken in Nepal-Magarkura - which has stops accompanied by glottal closure.⁷

2.2.2 Aspirated stop series / p^h t^h t̪^h d̪^h ... etc. /:

The aspirated stops ;in Sindhi have been considered as unit phonemes. The stop articulation is immediately followed by aspiration without any segmental release in between stop and aspiration articulation. It functions as a unit phoneme in the language and there is a contrast between an aspirated stop and a cluster of unaspirated stop followed by /h/ (which is divided by segmental release).

/l a k^h i/ 'you(sg.) value'; /e k h i/ '21st(fem.)'

/ə t̪^h i/ '8th(fem.)'; /e k ə t̪ h i/ '31st(fem.)'

2.2.3 Palatal stop series /c, c^h, j, j^h/:

Phonetically /c j/ are affricates [tʃ dʒ]. The sound begins with stop articulation and releases into homorganic continuant articulation. But the separation of articulating positions is very rapid and the affrication perceptible is very slight. These sounds, therefore, have been classified as stops instead of affricates. Besides the palatal series functions as other stop series and has aspirates /c^h j^h/, implosive /ɟ/ and nasal /ɲ/ like other stop series.

2.2.4 Nasals / m n ɳ ñ ŋ /:

Sindhi has a full nasal series corresponding to its stop series. All nasal phonemes are nasalised stops except the retroflex nasal /ɳ/ which has these allophones:

[n̠] Post-alveolar nasal occurring before retroflex stops:

[K a n̠ t̪ o] /Kant̪o/ 'fork'; [n̠ ə n̠ d̪^h o] /nand̪^ho/ 'small'

[ɳ̠] nasalised retroflex flap occurring elsewhere:

[raɳ̠o] /rano/ 'king'

⁷Cf., pp. 304.

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Considering the phonetic similarity between post-alveolar [ɳ] and mid-alveolar [n] /n/, [ɳ] could be treated as an allophone of mid-alveolar /n/. But as all other nasals occur with homorganic stops, this gap of retroflex nasal would be significant and would conflict with the 'neatness of pattern.' Therefore on the criteria of 'pattern congruity,' [ɳ] has been considered as an allophone of retroflex /ɳ/ in order to bring the most symmetrical portrayal of the system.⁸

Every nasal when occurring as the first member of a cluster with a homorganic stop after V² -- /i e ə o u/ is very much shortened and is lax [̤] [sa̤ɳji] /sa̤ɳji/ 'evening.'

Other general allophonic features of nasals which involve nasalisation of preceding or following vowels shall be discussed when dealing with nasalisation (ref. 5.4).

2.2.5 Vibrants / r ɽ / :

Both / r ɽ / are articulated in the same alveolar range. Therefore, the contrast of retroflexion versus non-retroflexion is very little perceptible. The distinctively perceptible contrast is flap / ɽ / versus trill / r /.⁹

2.2.6 Semi-consants /y w h/:

/y w/ are palatal and bilabial voiced frictionless continuants respectively. These are phonetically similar to /I V/ respectively. /I V/ occur in morpho-phonemic alternation with /y w/ respectively. In vowel sequences, /y/ does not contrast with non-syllabic /I/.

/h/ is a voiced glottal fricative [ɦ], except when it occurs as first member of the consonant-cluster, ^{where} it is phonetically voiceless frictionless continuant [h]

⁸Hockett, C. F., A Course in Modern Linguistics, 1958, p. 109. "If we are confronted with two or more ways of identifying allophones as phonemes, both or all of which equally well meet other criteria, we should choose that alternative which yields the most symmetrical portrayal of the system."

⁹Many natives of Hyderabad (Sind) and vicinity, often do not distinguish between flap /ɽ/ and trill /r/ vibrants.

- [h] /harʊ/ 'garland,' /gahʊ/ 'grass,' /əhhʲ/ ; 'Twenty first (Feb.).
 [h] /sahbi/ 'lordship,' /sahko/ 'asthama' /pɔ̃hto/ 'arrived'

In non-initial position, many times /y w h/ function as non-syllabic vowels: e.g. the nasalisation runs through a single vowel as a domain which consists of vowels, even with the intervocalic /y w h/ or their clusters /hy, wh/. (ref. 5.2):

/kɔ̃wɔ̃hu/ 'lotus' ; /t̪ʰəhyai/ 'he prepared.'

2.2.7 Consonant - length:

Intervocally after the vowel of class 1 -- /I U ɔ̃/, all stops, fricatives and nasals occur lengthened and tense. Gemination is not phonemic in Sindhi. But there are few examples where clusters of two same consonants occur at the morpheme boundaries in borrowed items. The length of these geminate clusters is usually more than that of the allophonic lengthened consonant (ref. 2.3.4.1).

2.2.8 Lax and Tense consonants:

All voiceless stops and fricatives are always tense except rest of the consonants are lax unless they occur after vowels of class 1, when they occur tense.

2.3 Distribution

2.3.1 All consonants, except /ɳ ɳ̃ ɳ̌ ɳ̍/, occur in word initial and medial positions.¹⁰ /ɳ ɳ̃ ɳ̌ ɳ̍/ occur only in medial positions.

2.3.2 Only following consonants occur in word final position:

p t t̪ c k
 b d ɟ g
 m n
 f s v
 ʃ x
 z
 l r ɾ h

All aspirated stops, implosives and /d, ɳ ɳ̃ ɳ̌ ɳ̍, ʃ/ and semi-consonants /y w/ do not occur in final position.

Consonants occurring in the final position form a low frequency system in the 'standard' dialect.¹¹ Their occurrence is restricted to (a) some

¹⁰ A. R. Kelkar, The Phonology and Morphology of Marathi, Ph.D. Thesis, Cornell University, 1959, "Phonologic word is the stretch of segmental phonemes with no non-close junctures within and bounded by non-close junctures and/or utterance boundary."

¹¹ Cf. Trumpp, p. 97, "In conformity with the Sindhi laws of sound no word can end in a silent consonant." It seems that Trumpp has not taken note of consonant endings of inflectional forms and borrowed items from Arabic and Persian.

inflectional forms (only /m n s/ endings), (b) loan words from Arabic, Persian and English and (c) morphophonemic reduced forms:

- (a) /cəyain/ 'He told me.'; /cəyain/ 'He told them.';
/cəyais/ 'He told him.'
- (b) /ʔəla t/ 'wrong'; /būland/ 'high, firm'; /kuc/ 'journey';
/bəraj/ 'dam over river'; /beʃək/ 'certainly';
/ekskərəʃən/ 'excursion'; /fæklas/ 'excellent (first class)';
/xʊʃ/ 'happy'; /xɔf/ 'danger'; /ʃex/ 'rude';
/əwə l/ 'first, before'; /bɔxəbər/ 'correct'.
- (c) /cʊp/ 'silent'; /rat/ 'night'; /UlətpUlə t/ 'topsy turvy';
/məɾniŋ/ 'dying (person)'; /kɔr/ 'Do'; /hɔrɔbər/ 'haste';
/əm/ 'om.'; /kəh/ 'who (obl.)?'.

In this respect Sindhi is unlike other Indic languages. It has retained the old Indo-Aryan short vowel endings in the form of /I U ə/ in word-final position, whereas most of other Indic languages have lost the final short vowels.

Sanskrit	Sindhi	Hindi
/kəɾmə/ 'work,'	/kəɾmU/	/kəɾm/
/əkəʃə/ 'eye'	/əkʰI/	/əkʰh/
/kəɾnə/ 'ear,'	/kəɾnU/ (sg.)	/kəɾn/
	/kəɾnə/ (pl.)	

2.3.3 Other limitations:

- (a) All implosives / b ɗ ɟ ɡ / do not occur after / u ɛ ɔ / and only / ɗ ɟ ɡ / do not occur after / I / as well.
- (b) All aspirated stops also do not occur after / ɛ ɔ /.
There is, however, one exception: / ɔ kʰ o / 'difficult.'
- (c) / ɖ / does not occur after / Uɪu, ɔ /
- (d) / ũ ŋ / occur only after all vowels of class 1 - / I U ə / and / a / of class 2. Exception: in one example / ŋ / occurs after / o /: / mɔŋi / 'purple-like color.'

2.3.4. Consonant clusters:

Many consonant-clusters occur across syllable and morpheme boundaries. The pattern of C. clusters occurring between two open junctures has been shown in the following chart.¹² The pattern of the formation of these clusters is

¹² The chart has been prepared on the basis of a large sample data. It, however, does not exhaust all possibilities.

Consonant-cluster Patterns.

II Member I Member	P	T	Ṭ	C	K	B	D	Ḍ	J	G	l̥	N	r̥	l̥	h	w	y
VI. Stops:																	
Bi-lab. P	-	x	x	-	x	x	x	-	x	x	-	x	x	-	x	x	x
Alv. T	x	-	-	-	x	x	-	-	-	-	-	x	x	x	x	-	x
Retr. Ṭ	-	x	-	-	x	-	-	-	x	-	-	x	x	x	x	x	x
Pal. C	-	x	-	-	x	x	-	-	x	-	-	x	-	x	x	x	x
Vel. K	x	x	-	x	-	x	x	-	x	-	-	x	-	x	x	-	x
Vd. Stops:																	
Bi-lab. B	-	x	-	-	x	x	x	-	-	-	-	x	-	x	x	x	x
Alv. D	-	-	-	-	x	x	-	-	x	x	-	x	x	x	x	x	x
Retr. Ḍ	-	-	-	-	x	-	-	-	-	-	-	x	-	-	-	-	x
Pal. J	x	-	-	-	-	x	-	-	-	x	-	x	-	x	x	x	x
Vel. G	-	-	-	-	-	x	x	-	-	-	-	x	-	x	x	-	x
Implosives:																	
	-	x	x	-	x	x	x	-	x	-	-	x	-	x	x	x	x
Nasals: N																	
	x	x	x	x	x	x	x	x	x	x	-	x	x	x	x	x	x
Fric:																	
VI. F	x	x	x	x	x	x	x	-	x	x	-	x	-	x	x	x	x
Vd. Z	x	-	-	-	-	x	x	-	-	x	-	x	-	x	x	x	x
Vibrants:																	
Lateral l	x	x	x	x	x	x	x	-	x	x	-	x	x	x	-	x	x
Semi-C:																	
h	x	x	x	x	x	x	x	x	x	-	-	x	x	x	x	-	x
w	-	x	-	-	-	-	-	-	-	-	-	x	-	-	x	x	-
y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

'x' Denotes occurrence of the cluster; '-' Denotes non-occurrence.

as follows:

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2.3.4.1 Formation of C. clusters:

- (a) All consonants, except /y/ occur as first member of the C. cluster.
- (b) /y/ occurs, as second member of the cluster, with every consonant other than /y/
- (c) /h/ doesn't occur in cluster with any aspirated consonant.
- (d) Implosives /b̥ d̥ ɟ̥/ and /ɳ̥ ɲ̥/, usually, do not occur as second member of the cluster except
 /r̥b̥, r̥ɟ̥, r̥b̥, h̥m̥/:
 /c̥ɔ̥r̥b̥i/ 'fat'; /s̥ʊ̥r̥ɟ̥ʊ/ 'heaven'; /h̥ɔ̥r̥b̥ɔ̥r̥/ 'haste';
 /ɕ̥h̥n̥ɔ̥/ 'symptoms.'
- (e) The clusters with nasals /m n ɳ̥ ɲ̥ ɟ̥/, vibrants /r ɣ/ and lateral /l/ as second member, have wider distribution than the clusters with stops, fricatives and semi-consonants /w h/. e.g. /ɣ/, as second member, occurs with all consonants except /b̥, d̥, ɟ̥, c̥, ʃ̥, ɳ̥, w, y/, whereas, /d̥/, as second member, occurs only with /m n h/.
- (f) Two aspirated stops never occur in one c. cluster. But examples of the clustering of voiceless and voiced consonants, aspirated and unaspirated consonants, as well as explosive and implosive consonants are found in the language.
 /ə̃c̥jo/ 'you(pl.) should come'; /c̥ʰə̃p̥bo/ 'shall be printed';
 /t̥ʰɪp̥bo/ 'shall be applied'; /r̥ãd̥hani/ 'capital'; /p̥ʊ̃t̥te/ 'behind';
 /c̥ə̃bb̥o/ 'shall be chewed'; /h̥l̥d̥ki/ 'hiccup.'
- (g) All aspirated stops are very sporadic in occurrence, as second member of the cluster. Usually they occur only with homorganic nasal and
 /m n n r r/: /m̥l̥nt̥ʰə̃/ 'request'; /k̥ʰə̃mb̥ʰʊ/ 'feather'; /n̥nd̥ʰo/ 'small';
 /s̥ə̃n̥j̥ʰi/ 'evening'; /p̥ə̃n̥k̥ʰo/ 'fan'; /s̥ə̃m̥j̥ʰə̃/ 'intelligence';
 /ə̃nb̥ʰɔ̃/ 'experience'; /ə̃nb̥ʰo/ 'fatless'; /n̥l̥r̥g̥ʰə̃t̥ʰ/ 'throat'
 /t̥ə̃p̥ʰə̃/ 'longing.'
- (h) Phonemic length of consonants is in complementary distribution in Sindhi (ref. 2.2.7). However in few borrowed items and in some words across the morpheme boundary, there is contrast between gemination and phonemic length. In such cases gemination has been treated as consonant cluster -- /bb̥, nn̥, rr̥/ :

/sɪbo/ [sɪb'o] 'you(pl.) sew'; /sɪbbo/ 'shall be sewed'; /kʰəno/ [kʰə n'o] 'you(pl.) lift'; /kʰəno/ 'to be lifted';
 /Unə/ [Un'ə] 'he(obl.)'; /Unnə/ 'wool';
 /kɪrU/ 'fall(imp.)'; /kərrvai/ 'proceedings.'

- (1) Many c. clusters with /b j n ɔ̃ / as second member, are usually formed across the morpheme boundary:

/cʰəpbo/ 'shall be printed'; /cʰəpjo/ 'you(pl.) would print';
 /cʰəpno/ 'to be printed'; /əɪɔ̃rɔ̃U/ 'careless.'

- (j) Three or more member c. clusters:

Some 3, 4 or even 5 member c. clusters also occur in the language. Three member clusters usually have ^{/y w h, r l, n, b j/} as their last member or /h/ as their first member. In few cases /m n p k/ also occur as third member:
 /əŋɔ̃rɔ̃/ 'fingers'; /əɔ̃rɔ̃wasi/ 'late (dead)'; /kʰəndhəɔ̃/ 'ruins'(pl.)
 /əŋɔ̃rɔ̃zi/ 'English'; /əmbri/ 'unripe mango'; /əbɔ̃rɔ̃/ 'Bungalow';
 /pəɔ̃njo/ 'to be married'; /təhki/ 'being boiled';
 /bəɔ̃rɔ̃t/ 'regarding'; /əhneə/ 'non-violence';
 /təɔ̃rɔ̃mo/ 'translation'; /ɪhɔ̃rɔ̃U/ 'engineer'; /vəɔ̃rɔ̃mənɔ̃pəɪ/ 'highheadedness'
 /əkəɔ̃rɔ̃n/ 'excursion.'

Four member clusters have /y r n/ as their last member and five member clusters have only /y/ as their last member. These clusters always occur across the morpheme boundary:

/bɪndryū/ 'short statured(f.pl.)'; /cʰəndri/ 'pinch'
 /ləŋɔ̃hɔ̃/ 'to be crossed(m.pl.)'; /ləŋɔ̃hɔ̃yū/ 'to be crossed(f.pl.)'
 /cʰəndryū/ 'pinches(pl.).'

2.3.4.2 Distribution of c. clusters:

Consonant clusters mostly occur in initial and medial position in the phonologic word. Few examples of clusters are also found in the final position as well.

- 2.3.4.2(1) Word-initial c. clusters: only clusters with /y w r l/ as second member occur in this position. Initial clusters with /w r l/ are found in borrowed stems only.

- (a) occurrence of /y/, clustered with different consonants is quite frequent: /pyarU/ 'love'; /ɔ̃yari/ 'Diwali festival';
 /dʰyanU/ 'attention'; /jyapo/ 'existence'; /ɔ̃yaro/ 'unique';
 /xyalɔ̃/ 'thought'; /hɔ̃yaU/ 'heart'; /wyo/ 'went'.

- (b) /w/ has been noticed only in one example of Persian origin:
/xwəhɪʃə/ 'desire.'
- (c) /r/ occurs in few borrowed items from Sanskrit, Persian and English:
/prəɪtʰna/ 'prayer'; /brəɦmaɪ/ 'priest'; /tɹəwə/ 'trolley car';
/sɹu/ 'start.'
- (d) /l/ occurs only in few English borrowed items:
/glasU/ 'glass'; /klasU/ 'class.'

2.3.4.2 (11) Syllable-initial clusters:

Besides word-initial clusters /y w r l/, clusters with /h r n n/ as second member also occur in the beginning of the non-initial syllable. (/ɹ/ represents syllable boundary).

- (a) All consonants occur with /y/.
/ka,hyo/ 'attacked'; /blɪkʰya/ 'alas'; /mɔ,ɟyo/ 'betrothed.'
- (b) /w/ has been noticed only with /ɟ s x/
/sɔɹ,ɟ wasi/ 'late (dead)'; /sɔɹ, swɔti/ 'goddess of knowledge';
/bɔɹ,xwast/ 'adjourned.'
- (c) /h/ occurs with different stops (unaspirated only), nasals /m n n/ vibrants & lateral /r r l/ and semi-consonant /w/:
/e,khɪ/ '21st(f.)'; /ke,ɟ hɪ/ 'where'; /ma,nhu/ 'person';
/vɪ,rhano/ 'partition'; /ba,whɪ/ '22nd(f.).'
- (d) /r r l/ occur with different consonants:
/sɔ,ɟ h ro/ 'sun-light'; /dɔ,ɟ ɹi/ 'frog'(f.),
/a,xɪn/ 'final'; /su,k h ɹi/ 'gift'; /b h o,ɟ ro/ 'monkey';
/bɔ,ɟ ti/ 'bottle'; /ka,ɟ lo/ 'caravan.'
- (e) /m n n/ occur in a few examples: /tɔɹ,ɟ mo/ 'translation'; /prəɪtʰna/ 'prayer'; /pɪɹdʰan,pno/ 'chairmanship'; /c h ɔp,ɟ no/ 'to be printed';
/pɔɹ,ɟ no/ 'province.'
- (f) Some three member c. clusters, with final member /y/, also occur in the syllable initial position. (Following all examples are feminine plural):
/sɔ,nhyũ/ 'thin'; /ba,nɹyũ/ 'monkeys'; /ɔm,bryũ/ 'unripe mangoes';
/c h ɔp,ɟ nyũ/ 'to be printed'; /k h o,k h lyũ/ 'hollow.'

2.3.4.2 (iii) Word-final clusters:

Consonant ending words form a low frequency system in Sindhi (ref. 2.3.2). Few borrowed items have been noticed with final consonant clusters -- /kt st , nd, ŋg/:

/b̄arwəkt/ 'at the same time'; /b̄arxwəst/ 'adjourned';
/ḡirhəst/ 'married life'; /b̄ulənd/ 'high, firm';
/m̄orning/ 'dying (person)'.

2.3.4.2. (iv) Syllable-final clusters:

Besides word-final clusters following clusters occur at the end of the non-final syllable:

- (a) Homorganic clusters: /ɪ̃n̄j_nerU/ 'engineer';
/l̄ɔŋg_h_no/ 'to be crossed'; /b̄əns_bət/ 'regarding.'
- (b) clusters with /h/ as first or second member:
/s̄um̄h_no/ 'to sleep(obj.)'; /s̄ənh_xr̄i/ 'thin(f.)';
/v̄əɖə_mənh_pai/ 'highheadedness'; /p̄ərh_no/ 'to read(obj.)';
/m̄əhn_t̄i/ 'hard-working'; /c̄um̄h_d̄ri/ 'pinch';
/t̄əhk_jənu/ 'to be boiled'.
- (c) clusters /ks, gz, rt, xr/ in borrowed items:
/əks_k̄ər_ś̄ən/ 'excursion'; /egz_b̄i_ś̄ən/ 'exhibition';
/m̄ərt_b̄o/ 'respect'; /k̄ərt_vai/ 'proceedings.'

3.0 VOWELS

3.1 Contrasts. The ten vowel phonemes contrast with each other in initial, medial and final positions. Contrasts between only those vowels which are phonetically comparable have been illustrated in this section:

- /i:/I/ /itə/ 'diamond in playing cards', /Itə/ 'kick'; /tirU/ 'arrow', /tIrU/ 'small particle'; /pUt^hI/ 'back', /pUt^hI/ 'support, backing';
- /i:/e/ /Isə/ 'side stack of a cot', /esi (tāi)/ '(upto) that'; /piro/ 'a ring of rope', /pero/ 'a candy'; /chokri/ 'girl', /chokre/ 'boy (obl.).'
- /I:/e/ /Iki/ 'odd', /eko/ 'unity'; /βilo/ 'male cat', /βelo/ 'forest'; /pItI/ 'curse (sg. Imp.)', /pItē/ 'one may curse.'
- /u:/U/ /unai/ 'deficiency', /Unai/ 'woven'; /surU/ 'pain', /eUrU/ 'tune'; /petu/ 'glutton', /petU/ 'stomach, belly.'
- /u:/o/ /uti/ 'breaking of a friendship', /oti/ 'hem'; /cūri/ 'a religious recipe', /cori/ 'theft'; /babu/ 'employee', /babo/ 'father';
- /U:/o/ /unə/ 'that (obl.)', /onə/ 'anxiety'; /gūfo/ 'doll (masc.)', /godo/ 'knee'; /maU/ 'mother', /mao/ 'a candy.'
- /e:/E/ /esi (tā i)/ '(upto) that', /ēsi/ 'luxurious', /wel / 'time', /wela/ 'cruelties', /te/ 'on', /tē/ 'decision.'
- /o:/o/ /orə/ 'the after birth', /orI/ 'a spice', /dora/ 'muscles', /dōra/ 'a forest fruit', /cəwəndo/ 'he will say', /cəwəndo/ 'you(pl.) will say.'
- /ə:/o/ /akarU/ 'nuisance', /ozarU/ 'tool, instrument', /gado/ 'carriage', /godo/ 'knee'; /ala/ 'wet (pl.)', /alo/ 'wet (sg.).'
- /a:/o/ /arI/ 'a needle', /orI/ 'a spice', /kalU/ 'god of death', /kəU/ 'promise', /hunda/ 'they may be', /hundə/ 'you(pl.) may be.'

- /a:/ /ə/ /achi/ 'offered(fem.),' /əchi/ 'white(fem.),' /aala/ 'brother-in-law,' /əalo/ 'sprout,' /aala/ 'brothers-in-law,' /aala/ 'years.'
- /I:/ /U:/ /ə/ /iba/ 'this(fem.),' /Uba/ 'that(fem.),' /əha/ 'O! (exclamation),' /pItə/ 'curse,' /pUtə/ 'son,' /pətə/ 'floors,' /chakarU/ 'boy,' /chokarə/ 'boys.'
- /I I ə ɛ ɔ ɔ ə ɔ:/ /hundi/ 'power of subsistence,' /hundi/ 'may be (f.sg.),' /hunde/ 'having means,' /hunde/ '(you) might be having it,' /hundo/ '(he) might be(fem.),' /hundo/ 'you(pl.) might be,' /hunde/ 'otherwise if.'
- /I I ə ɛ U u ə ɔ:/ /sIrə/ 'brick,' /sIrə/ 'midstream,' /Serə/ 'two-pound weight(pl.),' /səɾə/ 'walk (obl.),' /sUrə/ 'tunes,' /sarə/ 'pains,' /sarə/ 'longing,' /sarə/ 'Funeral Procession.'
- /I I ə U u ɔ ə ɔ:/ /k^hətI/ 'sour juice,' /k^hətI/ 'won, washerman,' /sour(fem.),' /k^həte/ 'let one win' /sour (mas.obl.),' /k^hətU/ 'you win(imp.),' /k^həto/ 'sour (mas.), you (pl.) win (imp.),' /k^həta/ 'sour (pl.),' /k^hətə/ 'cot.'

3.2 Phonetic description

3.2.1. Class 1 vowels

- 3.2.11 Any vowel of class 1 occurring at the end of segments containing more than one peak, preceded by a consonant is lax. Front /I/ and back /U/ are weakly voiced and centralised [ĩ ũ] and mid /ə/ is raised [ɛ̃]
[pItĩ] /pItI/ 'you(sg.) curse,' [pUtĩ] /pUtU/ 'son,' [pətə] /pətə/ 'floors.'
- 3.2.12 /I/ is slightly centralised [ĩ] in medial position, when preceded by sibilante /s z ʃ/: [sɛtə] /sɛtə/ 'line,' [zɪba:nə] /zɪba:nə/ 'tongue,' [ʃɪka:rə] /ʃɪkarU/ 'hunting.'
- 3.2.13 /I/ is relatively low [I^v] [ĩ^v] when preceded by /h/ [ca:hI^vnə]
'chahU' 'to like,' [bahI^v] /bahI/ 'fire.'
- 3.2.14 In all other situations /I U / occur [I] Lower-High Front unrounded, [U] Lower-High Back rounded and [ə] Mid Central unrounded.
[Ik^vi:] /IkI/ 'odd,' [bI] /bI/ 'also,' [khI^və] /khI^vU/ 'laugh(sg. imp.),' [Uchə] /UchU/ 'get up (sg. imp.),' [pUtə] /pUtU/ 'son,' [ɔc ə] /ɔcU/ 'Come (sg. imp.),' [tə] /tə/ 'that, then,' [dhi:ə] /dhi:ə/ 'daughter.'

3.2.2. Class 2 vowels.

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3.2.2.1 Any vowel of class 2 occurring finally or followed in the next syllable by a class 1 vowel is relatively longer.

- /i/ [iː] High - Front Unrounded long: [Ciːto:] /cito/ 'tiger'
 [i:] High-Front Unrounded with additional length: [khi:r̥i:] /khirU/ 'milk,'
 [ni:ri:] /niri/ 'blue(Fem.).'
 /e/ [eː] Higher - Mid Front Unrounded long: [peːti:] /peti/ 'box.'
 [e:] Higher-Mid Front Unrounded with additional length: [peːt̪i:] /petU/
 'stomach' [keː] /ke/ 'Some.'
 /ɛ/ [ɛ̃] Lower-Mid Front Centralised unrounded short before /h/ [ɛ̃hea:n̪]
 /ehsanU/ 'favour,' [Vɛ̃hm̪i:] /Vehm̪i/ 'suspicion, whim.'
 [ɛː] Lower-Mid Front unrounded long: [keːdi:] /kedi/ 'Prisoner.'
 [ɛ:] Lower-Mid Front unrounded with additional length: [beːt̪i:] /betU/ 'Poem,'
 [ʃeː] /ʃe/ 'thing.'
 /a/ [aː] Low Back Centralised unrounded long: [aːlo:] /alo/ 'wet(masc.),'
 [laːdo:] /lado/ 'marriage song.'
 [a:] Low Back Centralised Unrounded with additional length: [laːd̪i:]
 /lad̪U/ 'fondling,' [Wad̪aː] /Wada/ 'big (masc.pl.).'
 /u/ [uː] High Back Rounded Long: [Suːbo:] /subo/ 'Province.'
 [u:] High Back Rounded With additional length: [xuːb̪i:] /xubU/ 'nice,'
 [t̪uː] /t̪u/ 'you (eg.).'
 /o/ [oː] Higher-Mid Back Rounded Long: [oːre:] /ore/ 'near.'
 [o:] High-Mid Back Rounded with additional length: [oːt̪oː] /oto/ 'support,'
 [at̪oː] /ato/ 'fleur.'

3.2.2.2 Phonetically /ɔ/ is a falling diphthong [əʊ] or [ɔ̃]. Initially and medially it begins in the position of [ə] and moves in the direction of [U], the second element of the diphthong is lax and non-syllabic. Finally it begins in the position of [ɔ] and moves in the direction of [o], second element being lax and non-syllabic.

Distributionally it occurs in the same positions as simple vowel phonemes and is here considered as single vowel phoneme /ɔ/.¹

¹Ernest Trumpp, Grammar of the Sindhi Language 1872, (page 4) has stated that Sindhi has two diphthongs /ai/ and /au/. He also remarks "As a general rule Sindhi ignores diphthongs and pronounces them as two distinctive vowels." This might have been true in the speech of a century earlier, but at present, Sindhi has one simple vowel [ɛ] /e/ replacing Trumpp's /ai/ and one falling diphthong [əʊ or ɔ̃] /ɔ/ in place of his /au/.

- /ɔ/ [ɔ:] Finally [ɔ:] 'hundred,' [pɔl'ɔ:] /pɔl'ɔ/ 'bottom of a garment.'
- [əʊ] Short before /h/, [pəʊhte:] /pɔhte/ 'married.'
- [əʊ] long: In initial and medial positions [əʊ'khe:] /ɔkhe/ 'difficult'
- [dəʊ're:] 'circulation.'
- [əʊ:] With additional length: In initial and medial positions, [məʊ:ʒə:] /mɔʒə/ 'pleasure,' [əʊ:rɛ:] /ʒrɛ/ 'a spice.'

3.2.3. Vowel sequences

The phonetic [y] or [w] glide or glottal constriction [ʔ] occurs in between the oral vowel sequence. The phonologic conditioning of their occurrence has been discussed in detail in section 3.3.2.

3.2.4. Vowels with nasalisation:

- 3.2.4.1. Phonetically nasalised vowel is relatively lower than the respective oral vowel.
- 3.2.4.2. No vowel is glided when accompanied by nasalisation. e.g. [dʰi'u:] /dʰi'u/ 'daughters,' [pɔ̃'e:] /pɔ̃e/ 'last(obl.),' [ʒu:] /ʒu/ 'cow.'

3.3 Distribution.

3.3.1. Simple vowels:

- 3.3.1.1. All vowels occur in initial, medial and final positions.
- 3.3.1.2. /ɛ/ have quite a limited distribution. These vowels do not occur before implosives, aspirates, nasals /ñ ɳ/ and fricative /ʃ/. Exception: /ɔ/ occurs before an aspirate in one instance /kʰo/ 'difficult.'

3.3.2. Vowel sequences

All sequences occurring between two open junctures have been listed below in the chart.²

	i	e	u	ɔ	ɔ̃	a	u	ə
i	ii	ei	-	oi	ɔi	ai	ui	əi
e	ie	-	ue	oe	-	ae	ue	əe
u	iu	eu	-	-	-	au	-	əu
ɔ	io	eo	uo	-	ɔɔ	ao	uo	əɔ
a	ia	-	ua	-	-	aa	ua	əa
ɪ	-	-	uɪ	oɪ	-	aɪ	uɪ	əɪ
ʊ	ɪʊ	-	-	-	-	aʊ	ʊʊ	-
ə	ɪə	-	uə	-	-	-	ʊə	-

² The chart has been prepared on the basis of a large sample data. It, however, does not exhaust all possibilities of vowel sequences.

- ... 'now,'
 /k^hae/ 'let one eat,' /v^ortUI/ 'you(eg.) took.'
- 3.3.2.2. Vowel sequence consists either all oral vowels or all vowels accompanied with nasalisation:
 /huə/ 'she,' /hū:/ 'otherwise.'
- 3.3.2.3. /ɛ/ does not occur in vowel sequences. /ɔ/ does not occur as second member of the sequence and /I/ does not occur as first member of the sequence.
- 3.3.2.4. Sequences having /I U/ as second member are monosyllabic. Exception /U[~]U/.
 /I U/ in this position are relatively low, centralised, lax and non-syllabic. [ĩ̯ ũ̯].
 UI - /buI/ 'small,' oI - /joI/ 'wifa,'
 aI - /jaI/ 'house,' UI - /d̪inUI/ 'you(eg.) gave,'
 ɔI - /mɔInU/ 'to measure,'
 iU - /piU/ 'father,' aU - /maU/ 'mother.'
- 3.3.2.5. The remaining sequences are disyllabic:
 ii - /əsi/ 'eightieth(fem.)'
 ie - /d̪ie/ 'earthen lamp(obl.)'
 iu - /d̪iu/ 'daughters'
 io - /d̪io/ 'earthen lamp'
 ia - /d̪ia/ 'earthen lamps'
 iə - /hiə/ 'she (hither)'
 ei - /beI/ 'both'
 eu - /seu/ 'a snack'
 eo - /s̪e/ 'ninetieth(masc.)'
 ua - /sue/ 'pack needle(obl.)'
 uo - /suo/ 'pack needle'
 ua - /sua/ 'pack needles'
 uə - /huə/ 'she (thither)'
 oi - /koi/ 'anyone'
 oe - /p̪oe/ 'last(obl.)'
 ɔi - /s̪i/ 'hundredth(f.)'
 ɔo - /s̪o/ 'hundredth(masc.)'
 ai - /khai/ 'having eaten'
 ae - /khae/ 'let one eat'
 au - /khau/ 'greedy, glutton'

- ao - /khaɔ/ 'you(pl.) eat(imp.)'
 aa - /ɕaa/ 'left side(pl.)'
 ui - /sui/ 'needle'
 ue - /m̥ue/ 'dead(obl.)'
 Uo - /m̥Uo/ 'dead, died' (sg.)
 Ua - /m̥Ua/ 'dead, died' (pl.)
 UU - /hUU/ 'I was'
 Uə - /rUə/ 'to weep'
 ɔɪ - /ɕɔɪ/ 'having told'
 ɔə - /ɕə/ 'let one tell'
 ɔu - /ɕu/ 'let we tell'
 ɔo - /ɕəo/ 'you tell(imp. pl.)'
 ɔa - /sɔ̃a/ 'straight(masc. pl.)'

3.3.2.6. Some sequences of three vowels also occur in final position. In these cases third member of the sequence is mostly /ɔ/ or /a/

- əɪə - /pəɪə/ 'last(obl.)'
 Uɪə - /sUɪə/ 'needle(obl.)'
 əɪə - /maɪə/ 'women(obl.)'
 ɔɪə - /sɔ̃ɪə/ 'straight(obl. fem.)'
 euə - /seuə/ 'a snack(obl.)'
 ɔuə - /ɕuə/ 'cow(obl.)'
 Uau - /d̥Uau/ 'prayers, blessings.'

3.2.2.7. Phonetic slides

A phonetic glottal constriction [ʔ] occurs in between two peaks of the same phoneme /U/ /ɪ/ or /a/ (or in between peaks of /ɔ/ and /a/). It may be considered allophone of either of the phoneme.

- [Uʔ oo ʔU], [aʔ oo ʔa], [ɔʔ], [ɪʔ oo ʔɪ]
 [hUʔUs] /hUU/ 'I was,' [m̥UʔUs] /m̥UU/ 'I died'
 [əɪʔɪ] /sɔ̃ɪ/ 'eightieth (fem.)'
 [d̥o'laʔa:] /d̥ola/ 'troubles,' [ɕaʔa:] /ɕaa/ 'left (side)(pl.)'
 [sɔ̃ʔa:] /sɔ̃a/ 'straight(pl.).'

The remaining sequences are accompanied by [y] or [w] glide in between two vowels. Only one vowel occurs with homorganic off-glide or on-glide in the deg sequence in the following priority order:

- (i) I i (ii) U u (iii) e (iv) o
- /I i e/ occur with homorganic [y] glide.
- /U u o/ occur with homorganic [w] glide.
- (a) /I i/ oral vowels occur with off-glide [I^y i^y] as first member of the sequence or with on-glide [yI yI] as second member of the sequence.
- (b) /U u/ occur with off-glide [U^w u^w] as first member or with on-glide [wU wu] as second member in case /I/or/i/ does not occur in the sequence.
- (c) /e/ occurs with off-glide [e^y] as first member or with on-glide [ye] as second member in case /I i U' or u / does not occur in the sequence.
- (d) /o/ occurs with off-glide [o^w] as first member or with on-glide [wo] as second member in case /I i U u' or e / does not occur in the sequence.

4.0 Suprasegmental Phonemes

Every normal utterance consists of one or more macrosegments. "Macrosegment is the maximum domain of tactical relations at the phonologic level."¹

Segmental phonemes have been discussed in the preceding sections. Following are suprasegmental features in Sindhi.

4.1 Nasalisation: /~/ - a prosodic feature which has the scope of more than one segmental phoneme.

4.2. Junctures: Transition and rhythm of successive syllables.

(a) close juncture: /_/ (usually unmarked), coincides with syllabic boundary.

(b) open junctures:

1. Internal open (plus) juncture /+/, coincides with phonological word boundary.

2. Pause juncture /||/, coincides with clause boundary.

3. Terminal falling juncture /↓/, coincides with utterance boundary.

4. Terminal rising juncture /↑/, coincides with utterance boundary.

4.3. Accentual features: Combination of unanalyzed features of duration, pitch, intensity, and sonority.

weak & secondary accents: [˘^] non-phonemic

loud accent: /' / prominent syllable in phonologic word

extra-loud accent: /" /

drawled accent: /° /

} Prominent syllable in utterance.

4.4. Pitch levels: / 1 2 3 4 / represent relative low, mid, high, and extra-high pitch levels.

¹A. R. Kalkar, The Phonology and Morphology of Marathi (Ph.D. Thesis), Cornell University, 1958, p. 14.

Various features described in connection with junctures, accents, and pitch levels are very difficult to detect and verify when compressed over shorter segmental stretches and are subject to wide variation of ranges.

5.0 Nasalisation

5.1. Contrast:

There is a contrast between nasalised and non-nasalised vowels.¹

/ā̃hi/ 'restlessness' ; /adhi/ 'half Rupee'
 /ā̃hi/ 'tenth(fem.)' ; /d̄hi/ 'yogurt'
 /ə̃i/ 'we' ; /ə̃i/ 'eighty'
 /hū̃ə/ 'otherwise' ; /huə/ 'she'

Within the general distribution limitations of consonants and vowels, there is full contrast among all types of nasals. There are five nasal phonemes in Sindhi : / m n ŋ ã ŋ /. Initially and finally there is only a four-way contrast :

mã nã ã ã } but medially we get a seven-way contrast:
 am̃ añ ã ã }

-m̃C̃ -nC̃ -ŋC̃ -ñC̃ -ŋC̃ -ñC̃ -aC̃
 -Cm̃ -Cñ -Cñ̃ -Cñ̃ -Cñ̃ -Cñ̃ -Cã

Initial: /madi/ 'female'; /nali/ 'tube'; /ahi/ 'you(sg.) are';
 /ahi/ 'calamity.'

Final: /d̄im/ 'give me'; /d̄in/ 'give them'; /d̄i/ 'you give(sg. present)'
 /ji/ 'yes, of(fem.).'

Medial:

VNC

CNV

/Im̃tIhanU/ 'examination' ;	/aahmi/ 'weighing scale'
/Int̄Izari/ 'expectancy' ;	/cahna/ 'desire'
/g̃anti/ 'anxiety' ;	/g̃ehno/ 'ornament'
/m̃j̃nta/ 'obedience' ;	/ch̃ñano/ 'symptoms'
/s̃j̃nti/ 'friend' ;	---
/s̃at/ 'silence' ;	/s̃hi/ 'you(sg.) endure'
/j̃uto/ 'shoe' ;	/s̃hi/ 'signature, correct'

¹W. S. Allen, Phonetics in Ancient India, 1953, pp.39-40, "In connection with the vowels the working of the process is similarly quite clear. Here again the term 'ANUNASIKA' (having a nasal component) is regularly used, as opposed to the 'SUDDHA' or 'pure' non-nasalised vowels. (Atharva-Pratibhāṣya iv. 121). Another term, however, is also used by some of the treatises, namely RAKTA, 'colored,' (RK - Pratibhāṣya, i. 36. rakta - samjñe 'anunāsikah.')

/ hy wh / . A sequence of vowels is either all nasal or all oral. There is no sequence -- ṼV or ṼṼ. This domain, we may hereafter call it 'H' represents the following sequences:

V VV VhV VyV VwV VhyV VwhV
VhVV VyVV VwVV VhyVV VwhVV .

Hence the nasalisation has been considered as a prosodic feature with linear phonemes as its domain. While transcribing the nasalisation phonemically, only the onset of the domain "H" is marked as nasalised.

/s̃ɖiɔ/ 'straight(obl.)' /k̃wɔɔlɔ/ 'lotus' ;

/t̃ɔwhi/ 'you(pl.)'; /w̃iɦaɔ/ 'marriage' /t̃ɦaɦyɔ/ '(he) prepared.'

5.3. Degrees of nasalisation:

On the basis of phonetic identity and distribution, three degrees of nasalisation have been recorded:

1.) Strong nasalisation: /ãdɦi/ 'restlessness,' occurring in phonologically unpredictable positions, hence it is phonemic /~/.

Every vowel has a nasal counterpart. It is possible to consider nasalised vowels as separate phonemes, but since all the vowels occur nasalised in various environments, and the feature of nasalisation runs through the domain of the sequence of vowels, it is simpler to consider nasalisation /~/ a suprasegmental phoneme.

2.) Moderate nasalisation, 3. Weak nasalisation:

/ãndɦi/ 'storm' : /ɓ̃ndɦi/ 'blind(fem.)'

In certain phonological conditions, the nasalisation of the domain 'H' also occurs with N² (nasal consonants or nasal clusters with h or ɣ). H here represents:

m	n	ɳ	ṇ	ɳ	m̃h	ñh	ɳ̃h	ṇ̃h	ɳ̃h
my	ny	ɳy	ṇy	ɳy	hm̃	hñ	hɳ̃	hṇ̃	hɳ̃

As their occurrence is phonologically predictable, the nasalisation of types 2.) and 3.) are considered as allophonic features of nasal consonants.

²Cf. Allen, W. S., pp. 40,--- "There was a tendency.....general in the modern Indo- Aryan languages, for vowels to take on some degree of nasal 'colour' in contact with nasal consonants."

5.4. Distribution:

5.4.1. Phonemic Nasalisation:

(1) There is no contrast between nasal and oral vowels immediately before nasal consonant, i.e. $\tilde{V}N$ -- VN do not contrast. But nasal and oral vowel contrast after nasal consonants, e.g.: /muhə/ attitude(obl.) /nũhə/ 'daughter-in-law(obl.)', /cəgəi/ 'goodness', /cəŋtʰə/ 'good(fem.obl.)'

(ii) Nasalisation covering V^2 (vowels of class II) occurs in initial -medial- final positions and runs through the domain 'H'. But nasalisation with V^1 (vowels of class I) does not occur independently.

It occurs with vowel sequences and in all other formations of the domain 'H' in initial -medial-final positions.

V^2 -- /ẽ/ 'and'; /ẽdhI/ 'restlessness'; /ɔẽI/ 'we';
/vẽdho/ 'bachelor or widower without family';

V^1 -- /ɔ̃vwhi/ 'you(pl.)'; /kũəro/ 'soft'; /k̃wɔ̃U/ 'lotus';
/g̃aI/ 'cow.'

5.4.2. Moderate Nasalisation (allophonic feature of nasal consonants):

(1) It occurs with the domain H^2 (final vowel of class 2) when the nasal consonant is followed by another consonant. In this environment, the nasal consonant is very short and lax [\tilde{N}]. [H^2NC] -- /randiko/ 'tey'; /sẽjhi/ 'evening'; /bẽncə/ 'bench'; /sẽrjẽ/ 'fingers'; /tẽmi/ 'red from passion'; /c̃wainde/ 'they will cause to tell';

(ii) It occurs with final vowel preceded by N^3 : [$\tilde{N}V\#$] -- /k̃ɔ̃U/ 'work'; /b̃h̃ɔ̃U/ 'break(imp.)'; /m̃anhu/ 'person'; /m̃əŋyo/ 'batrothed'; /s̃ũm̃h̃ya/ 'they slept.

But there is contrast between domain 'H' after N with or without nasalisation: $NH\#$ contrasts with $N\tilde{H}\#$: /nai/ 'hair dresser'; /ñai/ 'nineth(fem.)'; /muhə/ 'attitude(obl.)'; /nũh / 'daughter-in-law(obl.).'

5.4.3. Weak Nasalisation (allophonic feature of nasal consonants):

(1) It occurs with H^1 (final vowel of class I) when the nasal consonant is followed by another consonant; [H^1NC]: /ɔ̃mbU/ 'mango'; /c̃l̃m̃ce/ 'spoon'; /l̃ñkarU/ 'refusal'; /s̃ɔ̃ŋm̃ərm̃əU/ 'marble'; /s̃uh̃ɔ̃ndi/ 'she will look nice.'

³In the speech of urban class, later borrowed item /m̃e/ or /m̃ẽ/ 'month of May' occurs without nasalisation and it contrasts with /m̃ẽ/ 'in.' As this item has high frequency in the language, the present analysis may have to be changed.

- (iii) /nɪmɔno/ 'humble' ; /mɪhmanU/ 'guest' ; /mɔnyani/ 'merchant's wife' ;
/mɔhyano/ 'monthly.'
- (iii) It occurs with H preceding final nasal : [m̃ɔ] :
/chokryU/ 'girls(obl.)' ; /kɔhyU/ 'I lifted' ; /cɔwɔ/ 'let them say.'
- (iv) It is in free variation with non-nasalisation, occurring with H immediately followed by an intervocalic H : [m̃ɔV] ↔ [mɔV] :
/sUɔno/ 'barren' ; /kɔhɔnU/ 'to eat' ; /cɪhɔno/ 'symptoms' ;
/sɔvani/ 'greenness.'

5.5. Phonemic status:

5.5.1. There could be an alternate solution, on the basis of the axiom "once a phoneme is always a phoneme," considering the phonetic similarity of the three degrees of nasalisation. Some linguists may prefer to treat the moderate and weak nasalisation as allophones of the suprasegmental phoneme of nasalisation /N/. But this would involve a great amount of redundancy in the phonemic writing. I would, rather, agree with Harris' view, "Segments and components which are dependent on particular phonemic environment, i.e. whose limitations of distribution can be stated in terms of the presence of other phonemes, do not have phonemic status."⁴ In this situation, distribution has been given precedence over phonetic similarity. This, of course, involves overlapping of phonemes. "Theoretically no phone is ever identical with any phone in a different position."⁵

5.5.2. Commenting upon the analysis of nasalisation as a prosodic feature, Ferguson, in his recent article, has stated, "Attempt to analyse nasality as accent, regarded either as having a natural 'peak' or some sort of a most convenient 'position of transcription,' is less satisfactory than analysing it by nasal segments (i.e. phonemes) in the appropriate positions. It is difficult to see the advantage of this (extraction of nasality from vowels only and regarding it as a separate phoneme) or how it differs in principle from (say) extracting the voicing from Bengali stops as a separate phoneme, which American Linguists do not do."⁶

⁴ Harris, Z. S., Methods in Structural Linguistics, 1957, p. 116.

⁵ G. H. Fairbanks, Frequency and Phonemics, Indian Linguistics, vol. 17, 1957, p. 110.

⁶ Phonemes of Bengali, Language, 36.1. (January 1960), p. 42.

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- 5.5.3. But in the case of Sindhi, on the basis of the phonological aspects:
- Every oral vowel has a nasal counterpart (3.0).
 - A domain 'N,' consisting sequence of vowels and semi-vowels /y v b/ is either all nasal or all oral (2.0). It can be concluded that in Sindhi, the extraction of nasalisation as a prosodic feature is quite different from the consonant components--voicing and aspiration (whose impact is limited within the segment). Hence in my opinion, the distribution of nasalisation in Sindhi can be stated most economically in terms of a prosodic feature.⁷

5.5.4. But in one respect, the nasality is different from other suprasegmental features: accent, pitch, etc., which besides being prosodic features functions as suprasegmental morphemic units as well, whereas the nasality in Sindhi does not occur as a separate morphemic unit. The nasalised morph is always accompanied with a vowel:

- e.g. /Cɔi/ 'having said,' /Cɔĩ/ 'you(eg.) may say'
 /a-e/ 'coming,' /a-ẽ/ 'you(eg.) came'
 /kɔu-a-i/ 'earned(f.eg.),' /kɔu-a-ĩ/ 'you(eg.) may earn'
 /kɔm-a-in/ 'they earn,' /kɔm-a-im/ 'you(eg.) earn for me.'

In the dichotomy of segmental and suprasegmental phonemes, I have considered nasalisation as a suprasegmental phoneme because of its prosodic features.

⁷H. M. Hoenigswald, *Nasalisation in Hindustani*, JAC, 1948, also has considered nasality a prosodic phoneme which has scope of more than one segmental phoneme.

6.0 Junctures

6.1. Contrasts:

- /ɹ/ : /+/¹ /bɹaɹ/ 'separateness,' /bɹa+ɹ/ 'even others,'
 /d̪e.k^haɹɹ/ 'showed,' /d̪e+k^haɹɹ/ 'give saltish (soda).'
 /+/ : /ʌ/ /#pUɹU+nədhɹɹɹ/ 'not son, daughter.'
 /#pUɹUɹnədhɹɹɹ/ 'son, not daughter.'
 /ʌ/ : /ʌ/ /#t̪uɹc^ha+weθo+pəɹhiɹmalkaniɹ/ 'What are you reading, is it "Malkani?"
 (written by Malkani)
 /#t̪uɹc^ha+weθ^ho+pəɹhiɹmalkaniɹ/ 'What are you reading, Malkani?'
 /ʌ/ : /ɹ/ /#k^hirUɹlɹsiɹcāhɹɹ/ 'milk, buttermilk, tea; (let me see, what else?)'
 /#k^hirUɹlɹsiɹcāhɹɹ/ 'milk, buttermilk, tea (complete list).'
 /ɹ/ : /ʌ/ /#to+ɹɹU+ghəno+kəɹmU+kəyoɹ/ 'you did much work today.'
 /#to+ɹɹU+ghəno+kəɹmU+kəyoɹ/ 'How much work did you do today?'

6.2. Phonetic description:

6.2.1. Close juncture: /ɹ/ characterises silence transition between vowels /V₁V/, and segmental release between consonants and start of another accent unit

/C₁C, C₁V, V₁C/

6.2.1.1. Syllabic division: /ɹ/ coincides with syllabic boundary. Within a syllable, there is smooth transition from C to V or V to C. C^hV, V^hC occur with one vocalic peak. Syllabic division is not distinctive in Sindhi. Following are the significant features through which syllable boundary could be located.

6.2.1.1.1. In the construction (C) V C V (C), the syllabic division is in between vowel and consonant (or semi-consonant). /aɹyo/ 'came,' /gaɹɹo/ 'carriage,' /baɹɹU/ 'garden,' /s̪UɹU/ 'tune,' /d̪aɹhə/ 'ten,' /pəɹko/ 'strong.' But in the construction C V₁ C V₁, when the consonant (except r ɹ l and semi-consonants y w h/ is in the intervocalic environment of V₁, phonetically it is a geminate

¹ /ɹ/ is not marked in the phonemic transcription.
 /+/ in many cases is indicated by space.

consonant [C C] and the syllabic boundary cuts right through the combination in two syllables [C V₁ C₂ C V₁].

6.2.1.1.2. Intervocalic two-member consonant clusters are usually divided by the syllable boundary. But when y or h is the second member of the c. cluster, the boundary occurs before the cluster: /sə₁tu/ 'hard,' /sə₁hə/ 'small,' /sə₁ya/ 'permission,' /sə₁khī/ '21st(f.),' /sə₁sha/ 'person.'

exception: /xū₁hal/ 'happy,' /bəd₁has₁ma/ 'indignation' (due to morpheme boundary).

6.2.1.1.3 When /x₁l/ is the second member of the c. cluster occurring after V₂ (except when /h/ is the first member), the syllable boundary is drawn before the cluster. Same clusters occurring after V₁ are dealt with according to the preceding rule.

(a) /mɔ₁klɔ₁nū/ 'to send,' /bɔ₁tlī/ 'bottle,'
/c^ho₁kri/ 'girl,' /su₁k^hri/ 'gift,'

(b) /tɔ₁klīfə/ 'trouble,' /kɪt₁li/ 'kettle,' /rɛk^hri/ 'a ceremonial thread.'

(c) /pɛh₁rī/ 'before, first' /kɛh₁rɔ/ 'which,' /dɛh₁lo/ 'tenth.'

6.2.1.1.4. In 3-4 member c. cluster, the syllable boundary cuts through the cluster, keeping 2 or 3 consonants in one syllable, grouped in the following order: (rules are applied in order.)

(i) y or h as the last member of the cluster: /pɛh₁ryō/ 'first,'
/ɔ₁r₁rhō/ '18th(masc.).'

(ii) r, y or l as the last member of the cluster: /bɛh₁trɪn/ 'better,'
/wɪn₁dral₁nū/ 'to entertain.'

(iii) h as the first member of the cluster: /wɛh₁ti/ 'hard working,'
/cɪh₁dri/ 'pinch,'
/ɛh₁na/ 'non-violence.'

(iv) Homorganic nasal as the first member:

/lɔ₁ng^hno/ 'to cross,' /bɔ₁na₁bɔt/ 'regarding.'

(v) w as the second member: /wɔ₁r₁swa₁ti/ 'goddess of knowledge,'
/wɔ₁r₁g^hwa₁si/ 'late (dead).'

(vi) nasal as the second member:

/tɔ₁r₁jno/ 'translation,' /pɔ₁r₁g^hna/ 'prayer,'
/c^hɔ₁r₁jno/ 'to be printed.'

by
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6.2.1.2. Syllabic Patterns: Following patterns of syllables are found in the language:

- (1) V: /aʃu/ 'today,' /baʃtaʃliha/ 'h2,' /vandaʃkaʃ/ 'leisure.'
- (2) CV: /paʃki/ 'razor'
- (3) VC: /aʃgreʃi/ 'English,' /caʃis/ 'call him'
- (4) CVC: /xUʃhal/ 'happy'
- (5) CCV: /tyaʃri/ 'preparation,' /aʃbru/ 'respect'
- (6) CCCV: /banʃdryu/ 'monkeys(f.pl.)'
- (7) VCC: /əhnʃsa/ 'non-violence,' /lāʃnaʃu/ 'engineer'
- (8) CVCC: /cUhnʃdri/ 'pinch,' /mʃning/ 'dying (person)'
- (9) CCVCC: /bʃuʃwaʃt/ 'adjourned'
- (10) CCVC: /xwʃəʃ/ 'desire,' /Uʃlhanʃdo/ 'west' /tyaʃryʃu/ 'preparation(obl.)'
- (11) CCCVC: /cUhnʃdryʃu/ 'pinches(obl.)'
- (12) CVV: /joʃ/ 'wife,' /kʃhʃraʃ/ 'you feed'
- (13) CVVC: /dUkʃdaʃk/ 'sad'

6.2.2. Internal open juncture /+/:

Phonetically open junctures /+, //, ↓↑/ are in incremental relation to one another in that order. // has most of the features of /+/ and some others. ↓↑ have most of the features of // and some others.

The internal open juncture /+/ manifests itself following phonetic features. It is determined by a) transitional: the pattern of segmental phonemes and b) rhythmical features: over all intensity and duration pattern.

6.2.2.1. Transitional (segmental) features:

- (1) Prolongation of vowels of class 2 in pre-junctural position.

[wəʃda:] /wəʃda:+/ 'pride,'

[wəʃda:ɪ:] /wəʃda:ɪ+/ 'even big(persons)'

Post-junctural and medial V² are relatively shorter. Acoustic analysis indicates relative duration of pre-junctural and post-junctural allophones. Other examples of the same nature are as follows:

[to:ʃra:ʃda:ʃh^hɛ:] /to:ʃra:ʃda:ʃh^hɛ/ 'Did you see the price of the weight?'

[to:ʃra:ʃda:ʃh^hɪ:] /to:ʃra:ʃda:ʃh^hɪ/ 'Did you see the queen?'

[te:ʃde:ʃkhā:ʃpUʃhU] /te:ʃde:ʃkhā:ʃpUʃhU/ 'Ask from the cross-eyed(person)'

[te:ʃde:] /te:ʃde/ 'Give three.'

evident in the following example:

[nɔ̃cɛ:] /nɔ̃cɔ̃/ 'Dance (Imp. pl.).'

[nɔ̃^ɔ̃co:] /nɔ̃^ɔ̃co/ 'Don't come.'

The spectrographic test reveals that in /nɔ̃^ɔ̃co/, vocalic continuum [ɔ̃-ɔ̃] changes its direction in the middle. The initial phase starts higher than the vocalic continuum of [ɔ̃] in /nɔ̃cɔ̃/.

(3) /I U/ are lax, centralised, lowered, and lengthened in pre-junctural position. Both vowels tend to leave their respective front and back positions and the contrast is identified mainly by roundedness and unroundedness.

[bɔ̃^ɛrUkha:phUlka:] /bɔ̃^ɛrUkha+phUlka/ 'two plain pancakes'

[bɔ̃^ɛrɔ̃:kha:] /bɔ̃^ɛrU+kha/ 'Eat fire! (a curse)'

The contrast between post-junctural and pre-junctural allophones of /I U/ is evident in these examples, in which /II/ and /UU/ occur in sequence:

[jUt^hɛ:nɔ̃^kɔ̃re:] /jUt^hɛ+nɔ̃^kɔ̃re/ '(he) may not cause trouble.'

[jUt^hɛ:nɔ̃^kɔ̃re:t^hɛ:] /jUt^hɛ+nɔ̃^kɔ̃re+t^hɛ/ 'The trouble was caused because of this.'

[pUt^hɛ:t^hɛ:] /pUt^hɛ+t^hɛ/ 'Son was born.'

[pUt^hɛ:Ut^hɛ:] /pUt^hɛ+Ut^hɛ/ 'Son got up.'

In these examples, also the vocalic continuum changes its position in the middle [ɛ^ɛ I] [ɛ^ɛ U]. In /I+I/, the initial phase starts in central position [ɛ^ɛ] but the later phase moves to higher and fronter [I]. Similarly, in /U+U/, the initial phase starts in central position [ɛ^ɛ] but the later phase changes to higher and back [U].

(4) Any consonant in pre-junc. position, occurs with a release and it is longer than the post-junc. allophone.

[d̪yɔ̃:nɪaro:] /d̪yɔ̃+nɪaro/ 'Give (something) strange'

[d̪yɔ̃^nɪaro:] /d̪yɔ̃^nɪaro/ 'Give them, friends.'

[xubsurɔ̃^t^chokri:] /xubsurɔ̃^t^chokri/ 'beautiful girl'

[xub^surɔ̃^:thya:] /xub+surɔ̃^+thya/ 'lot of pains happened.'

Overall intensity and pitch make a considerable distinction in identifying the contrast of absence or presence of /+/. 30

- (1) A /+/ is found in between two different peaks of pitch levels.
[wɔda:ī:] /wɔda+i+/ 'even big (persons)'
- (2) The intensity pattern gives an important clue for identifying /+/.
Intensity increases on post-junc. allophones and decreases on pre-junc. allophones.

[c̃i:ñco:] /c̃i+ñco/ ' (you) are saying, dance!'
[c̃i:ñco:] /c̃i+ñco/ ' (you) tell them, come!'

Intensity on [n] in /ñco/ is rising and in /c̃i+ñco/ is falling.

A phonemic /+/ is assigned in between two vowels of the same quality occurring in sequence, on the basis of lowering and rising of the pitch during the vocalic continuum.

[chaya:] /chaya/ 'shade'

[chaya:] /chaya/ 'What came?'

In the above example, vocalic continuum [...a...] is segmented in two vowels [aa] on the basis of falling and rising pitch.

In the examples given above e.g. /wɔda+i+/, /ñco/, /jUt^hl+Iñco+re/, /pUt^hU+U^hyo/; besides the length of vowels, raising of [ɔ̃] or lowering and centralisation of [ɔ̃^v ɔ̃^v], intensity pattern (pitch) makes a considerable distinction in identifying /+/.

- (3) Intensity drops abruptly over pre-junc. consonants, whereas the intensity drop over pre-junctional vowel is gradual, spread over relatively longer period of time.

[nəɾɔm̃ andi:] /nəɾɔm̃+andi/ 'brought soft'

[nəɾɔm̃ andi:] /nəɾɔm̃+andi/ 'male and female'

6.2.2.3. Discussion:

The phonetic characteristics, mentioned above, show that /+/ essentially deals with the dimension of time. Any utterance containing /+/ is relatively longer than the same utterance without /+/. On the basis of having constant phonetic feature of duration, /+/ in Sindhi has been interpreted as a suprasegmental phoneme.

In summary, the phonetic characteristics of /+/ in Sindhi are as follows:

- 1) Lengthening of vowels in pre-junctural position,
- 2) Intensity of stress--rising and falling pitch in post-junctural and pre-junctural positions,
- 3) Abrupt drop in intensity over pre-junctural consonant, and gradual drop in intensity over post-junctural consonant,
- 4) Laxness and centralisation of pre-junctural vowels of class 1,
- 5) Release in pre-junctural consonants.

6.2.2.3.1 In Pike's interpretation of the language /+/-/ occupies rather a different place within the phonological hierarchy.² In his analysis, junctures are not phonemes themselves. They are identificational-contrastive features from higher -- layered units in the manifestation mode. In this case, relative prolongation due to the presence of /+/-/, is assigned to the pre-junctural and post-junctural allophones and /+/-/ itself remains just a contrastive feature without any phonetic characteristics.

6.2.2.3.2. Junctural boundary appears to correlate rather significantly with the traditional 'lexical word' boundary. Morpheme boundaries do indeed often coincide with the word boundaries. Morpheme boundaries which are not at the same time lexical boundaries are not classified by junctural features.

There is a potential juncture at the lexical word boundary which may or may not be realised when the sequence of words is uttered. When there is no phonetic manifestation assigned to /+/-/, there is no junctural boundary between the bounded sequence. In normal rapid speech, two or more lexical words appear as one bounded sequence.³

6.2.3. Pause juncture /||/: This usually coincides with clause boundary and is characterised by all features of /+/-/ and a short pause (breath egressing), slowed up articulation and abrupt cut-off of voicing.

²K. L. Pike, Language in Relation to a Unified Theory of Structure of Human Behavior, vol. I-III, 1954-55.

³I. Lehtiste, An Acoustic-Phonetic Study of Internal Open Juncture, University of Michigan, 1959, has defined the bounded sequence by the presence of segmental (distributional and allophonic) and suprasegmental patterns. Every sequence begins and ends with marginal allophones (pre-junctural and post-junctural allophones). It consists of an initial phase, a body and a terminal phase.

6.2.4. Terminal Falling and Rising junctures /↓↑/:

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These occur in utterance final position and are characterised by all features of /+/ and somewhat longer pause, greater slowing up of articulation than in /||/ and a gradual cut-off of voicing. Silence may be extended indefinitely. Terminal juncture occurring with falling pitch i.e. gradual fading away of the force of articulation /↓/ is in contrast with the terminal juncture occurring with rise in pitch /↑/.

7. Accent and Pitch

7.1. Accent:

At word-level, difference in relative loudness or prominence of syllables is not a distinctive feature. A phonologic word has only one prominent syllable i.e. loud accent /' / and other syllables in the word have secondary / ^ / or weak / ~ / accents. The position of the loud accent /' / is predictable in a word against that of / ^ ~ /. These accents are usually not marked in the phonemic transcription.

But in an utterance, the most prominent accent i.e. extra loud accent /" / or drawled accent /° / is in contrast with the loud accent /' /. An utterance has only one extra loud /" / or drawled /° / accent.

7.1.1. Extra loud accent /" /: It is normally used in an emphatic statement and its position in an utterance shifts according to the object of emphasis. The contrast between /' / and /" / accent could be illustrated in the following examples:

/' / : /" /

/ # máwihǎ dǐhǎ tǎrsyŭs↓ / 'I waited for 20 days.'

/ # máwihǎ dǐhǎ tǎrsyŭs↓ / 'I(not he) waited for 20 days.'

/ # máwihǎ dǐhǎ tǎrsyŭs↓ / 'I waited for full 20 days (not 2 or 3 days)

/ # máwihǎ dǐhǎ tǎrsyŭs↓ / 'I waited for 20 days (not hours).'

7.1.2. Drawled accent /° /: It is normally used in an utterance denoting irritation or encouragement to someone. Phonetically the vowel of the most prominent syllable is stretched (normally 4-5 times than the normal length of the vowel) and pre-drawled or post-drawled syllable is very much shortened. /a° / phonetically could be represented as [aaaa]. The contrast between /' / and /° / is as follows:

/ # á s t é↓ / 'slowly' (general statement).'

/ # ǎstǎ↓ / [ǎstǎǎǎǎ] '(I again warn you) slowly.' (irritation)

/ # ǎstǎ↓ / [aaaaǎstǎ] '(Yes) still slower.' (confirmation or encouragement).

7.1.3. Accent at word-level: The accent position of / / ^ v / in a word with syllable divisions marked can be located in the following manner:

The rules are applicable in order:

- 1) A monosyllabic word has one loud accent:

/bɔ/ 'two,' /jam/ 'many'

- 2) In a word, containing syllables with V^1 and V^2 , one of the V^2 syllables has loud accent:

/x̌ťo/ 'good,' /raʃũ/ 'rule,' /ťəpali/ 'postman,'
/bɛʃk/ 'certainly.'

- 3) In consonant-ending words, the last syllable has the loud accent:

/ɔnuman/ 'guess,' /fɔkɔt/ 'only'

- 4) When more than one syllables occur with V^2 , the non-initial syllable containing V^2 has the loud accent:

/ʃadi/ 'marriage,' /sai/ 'green(f.)' /sarəhɔ/ 'praise,'
/cɛhcito/ 'fun.'

- 5) When there is more than one occurrence of V^2 syllables in non-initial position, the last but one syllable containing V^2 has the loud accent:

/cɔmaso/ 'monsoon,' /lɔďarəyo/ 'caused to move (swing).'
/m̌iťai/ 'candy' /hɔťɔri/ 'hammer.'

- 6) In a two-syllable word, both syllables containing V^1 , the initial syllable has the loud accent:

/siťə/ 'line,' /uťũ/ 'get up(imp.).'

- 7) In a three-syllable word, all syllables containing V^1 , the middle syllable has the loud accent:

/xəbərɔ/ 'news,' /šibonũ/ 'to sew.'

- 8) All non-loud syllables in the word containing V^2 , have the secondary accent: /kedi/ 'prisoner,' /ǩaindo/ '(he) will eat.'

- 9) All non-loud syllables in the word containing V^1 , have the peak accent: /ɔwɔ/ 'first,' /bandərũ/ 'monkey.'

7.2. Pitch levels:

7.2.1. Macrosegment: Every macrosegment includes at least two pitch levels; one at the end and one at the center. If there is a pendant portion¹ There is an

¹C. F. Hockett, A Course in Modern Linguistics, 1959, p. 38, "(In a macrosegment) everything from the center to the end, including the center, is the head; anything which precedes the center is pendant."

additional pitch level at the beginning. There may be a fourth pitch level somewhere between the beginning and the center. Every macrosegment ends with a terminal contour (clause juncture //, terminal Falling /↓/ or terminal Rising /↑/ junctures) which automatically mark the boundary between successive macrosegments in a single utterance.

/tʰaɪlɪndʊs¹↓/ 'yes, I'll come.'

/tʰɔs²||²hən²n²ɔ²xɔ¹↓/ 'Stop (o.k.). Don't come now.'

7.2.2. Common intonations: There are 4 relative pitch levels: low, mid, high, extra-high, marked as /¹²³⁴/ respectively.

The common intonation of an ordinary utterance is /²³¹/; pitch-level (PL) /²/ at the beginning, PL /³/ at the center and PL /¹/ at the end. But the intonation pattern of an emphatic statement or question is normally /²/³⁴¹/. And at the clause boundary, usually the final PL is /²/.

/tʰɔmbɔ³nɔ¹k¹h¹↓/ 'Don't eat mangoes.' (advice)

/tʰɔmbɔ⁴nɔ¹k¹h¹↓/ 'Don't eat mangoes.' (forbiddance)

/tʰɔɔ²||²ɔmbɔ³h¹le¹k¹h¹↓/ 'O.k., let you eat mangoes.'

7.2.3. Contrast: The contrast of these 4 pitches could be illustrated in the following examples:

Question: /tʰu²~kɛ³tʰɔ³ thewəñ¹¹↓/ 'Where are you going?'

Answers: 1. /tʰg²ɔ¹r¹↓/ 'Home.'

2. /tʰg³ɔ¹r¹↓/ (I repeat, listen clearly) 'Home.'

3. /tʰg⁴h⁴ɔ¹r¹↓/ 'Home' (But why are you concerned about it?)

4. /tʰg⁴g⁴ɔ¹r¹↓/ 'Home' (With great annoyance)

5. /tʰg³ɔ¹x²↓/ '(Of course) Home'

6. /tʰg³h⁴ɔ¹r¹↑/ '(What did you say?) 'Home?'

7. /tʰg⁴h⁴ɔ¹r¹↑/ 'Home!' (surprise)

8. /tʰg⁴h⁴ɔ¹r¹↑/ 'Home?' (Why?) (Concerned about the reason).

8. Morphophonemics

"An utterance has a phonemic structure and a grammatical structure. Its phonemic structure reflects some of the phonemic pattern or system of the language. Its grammatical structure reflects some of the grammatical pattern ~~of~~^{of} system of the language. The relationship of its phonemic structure to its grammatical structure reflects some of the morphophonemic patterns of the language."¹

In agreement with Harris' concept of morphophonemics,² I have defined a morphophoneme as 'A class of phoneme--length segments which are non-contrastive (complementary or free variant) within one morpheme (holding the morpheme constant) while into phonemes, grouped segments are non-contrastive without regard to morpheme constancy.' Sometimes a morpheme represents the feature (phoneme) and sometimes represents its absence: e.g. /kəhro ∞ kəro/ 'which?'. Each morpheme is composed directly of a sequence of morphophonemes, each of which in turn is a class consisting of one or more non-contrastive phonemes or components (within a morpheme).

All morphophonemic operations occurring in Sindhi can be grouped under these three headings:

1. Automatic alternations: These are divided into two sub-groups a) Phonologically conditioned alternations; b) Morphologically conditioned alternations.

¹C. F. Hockett, A Course in Modern Linguistics, 1959, p. 142.

²Z. S. Harris, Structural Linguistics, 1947, pp. 232, 262, 376-77. Harris has defined morphophoneme as a class of one or more complementary phonemes or components and has later explained two situations of a) free variation b) feature and its absences, whereas I have replaced 'complementary' with 'non-contrastive.'

2. Non-automatic alternations: Systematic pattern of alternations which cannot be stated in automatic phonological or morphological conditions.

3. Alternations in free variation: (Style variants, etc.). In normal rapid or slow speech or in different styles, the presence or absence of a particular phoneme length segment.

The following list reveals the pattern of the morphophonemic changes. It does not exhaust all possible changes occurring in the language. ' - ' denotes 'morpheme boundary'; ' → ' denotes 'is written as'; ' ∞ ' denotes 'in free variation'; ' / ' denotes 'or'; ' < > ' denotes 'morphemic writing.'

8.1. Automatic alternations:

8.1.1. Phonologically conditioned alternations:

8.1.1.1. Extension of nasalisation:

- (1) $H \rightarrow \tilde{H}$ before vocalic nasalisation (for definition of H refer 5.2)

$j\alpha I - \tilde{u} \rightarrow /j\tilde{o}yu/$ [$j\tilde{o}yu$] 'wives'

$g\alpha I - \tilde{u} \rightarrow /g\tilde{a}yu/$ [$g\tilde{a}yu$] 'cows'

But $\tilde{H} \rightarrow H$ before nasal consonant (although /HN/ phonetically remains [HN])

$g\alpha I - u\tilde{n} \rightarrow /g\alpha y\tilde{u}n/$ [$g\alpha y\tilde{u}n$] 'cows(obl.)'

- (ii) $V \rightarrow \tilde{V}$ after N+ /NV+ / $\tilde{V}+$

$/hu + i/$ 'even he,' $/k^h ad^h u\tilde{m} + i/$ 'as soon as I ate,'

$/m\alpha + i/$ 'even I,' $/t\tilde{u} + i/$ 'even 'you.'

8.1.1.2. $U/e \rightarrow w$ before α/a and after $\alpha/a/a$

$j\alpha U - \alpha \rightarrow /j\alpha w\alpha/$ 'barleys'

$deU - \alpha \rightarrow /dew\alpha/$ 'devils'

$sac - \alpha \rightarrow /sawa/$ 'green(m.pl.)'

8.1.2. Morphologically conditioned alternations:

8.1.2.1. Root-final $I/i \rightarrow y$ before suffix with initial U/u

$ratI - \tilde{u} \rightarrow /raty\tilde{u}/$ 'nights'

$sai - Un \rightarrow /sayUn/$ 'green(f.,pl.obl.)'

8.1.2.2. Root-final $y \rightarrow i$ before imperative suffica < - U >

$py - U \rightarrow /piU\infty pi/$ 'drink(eg.)'

$t^h y - U \rightarrow /t^h iU\infty t^h i/$ 'become(eg.)'

Exception: $d\dot{y} - U \rightarrow /d\dot{e}/$ 'give(eg.)'

8.1.2.3. Root-final U $\rightarrow o$ before suffix (-U) or (-i).

$d^h U - U \rightarrow /d^h oU \infty d^h o/$ 'wash(eg.)'

$rU - U \rightarrow /roU \infty ro/$ 'weep(eg.)'

$dhU - i \rightarrow /d^h oi/$ 'having washed'

$rU - i \rightarrow /roi/$ 'having wept'

- 3.1.2.4. Infinitive suffix-initial $\text{ə} \rightarrow \text{ɪ}$ after the root ending in $\text{a}/\text{o}/\text{p}/\text{h}/\text{ch}$:
 $\text{k}^{\text{h}}\text{a}-\text{ə} \rightarrow /k^{\text{h}}\text{aɪ} \text{ 'to eat'}$
 $\text{pə}-\text{ə} \rightarrow /pəɪ \text{ 'to thread'}$
 $\text{mə}-\text{ə} \rightarrow /məɪ \text{ 'to measure'}$
 $\text{kəh}-\text{ə} \rightarrow /kəhɪ \text{ 'to attack'}$
 $\text{məh}-\text{ə} \rightarrow /məhɪ \text{ 'to attract'}$

8.2. Non-automatic alternations:

8.2.1. Root-final $\text{ɪ} \rightarrow \text{ɪ}/\text{y}$ before suffix with initial ɔ :

- $\text{kə}^{\text{h}}\text{t}^{\text{h}}\text{ɪ}-\text{ɔ} \rightarrow /kə^{\text{h}}\text{t}^{\text{h}}\text{ɪ} \text{ 'wood(obl.)'}$
 $\text{kə}^{\text{h}}\text{t}^{\text{h}}\text{ɪ}-\text{xu} \rightarrow /kə^{\text{h}}\text{t}^{\text{h}}\text{y} \text{ 'woodcutter'}$

8.2.2. Imperative (eg.) suffix $(-\text{U}) \rightarrow \text{U}/\text{ɪ}$ after root $(\text{ə})\text{U} \rightarrow \text{U}$ when the last syllable of the root contains $\text{U}/\text{ɪ}/\text{y}$

- $\text{pUc}^{\text{h}}-\text{U} \rightarrow /pUc^{\text{h}} \text{ 'ask(eg.)'}$
 $\text{rU}-\text{U} \rightarrow /rU \text{ 'weep(eg.)'}$
 $\text{dIa}-\text{U} \rightarrow /dIaU \text{ 'see(eg.)'}$
 $\text{wIh}-\text{U} \rightarrow /wIhU \text{ 'sit(eg.)'}$
 $\text{py}-\text{U} \rightarrow /pɪU \text{ 'drink(eg.)'}$

(11) $\text{U} \rightarrow \text{ɪ}$ when the last syllable of the root contains $\text{ɪ}/\text{a}/\text{u}/\text{o}$:

- $\text{piə}-\text{U} \rightarrow /piəɪ \text{ 'grinding(eg.)'}$, $\text{Ser}-\text{U} \rightarrow /səɪɪ \text{ 'move(eg.)'}$
 $\text{k}^{\text{h}}\text{ot}-\text{U} \rightarrow /k^{\text{h}}\text{otɪ} \text{ 'dig(eg.)'}$, $\text{pur}-\text{U} \rightarrow /pʊɪ \text{ 'busy(eg.)'}$
 $\text{so}-\text{U} \rightarrow /soɪ \text{ 'weed(eg.)'}$

(111) $\text{U} \rightarrow \text{U}/\text{ɪ}$ when the last syllable of the root contains $\text{ə}/\text{a}$

- $\text{mər}-\text{U} \rightarrow /mərU \text{ 'die(eg.)'}$; $\text{kər}-\text{U} \rightarrow /kərU \text{ 'do(eg.)'}$
 $\text{p}^{\text{h}}\text{at}-\text{U} \rightarrow /p^{\text{h}}\text{atU} \text{ 'cry out(eg.)'}$; $\text{kət}-\text{U} \rightarrow /kətU \text{ 'cut(eg.)'}$
 $\text{k}^{\text{h}}\text{a}-\text{U} \rightarrow /k^{\text{h}}\text{aU} \text{ 'eat(eg.)'}$; $\text{fə}-\text{U} \rightarrow /fəU \text{ 'sing(eg.)'}$

8.2.3. Changes before past tense suffixes: $-\text{yo}/\text{o}$ (n.sg.), $-\text{a}$ (n.pl.),

$-\text{ɪ}$ (f.sg.) $-\text{yũ}$ (f.pl.) or $-\text{ɪ}$ (gerund):

8.2.3.1. Root-final $\text{n} \rightarrow \text{n}/$:

- $\text{ʃən}-\text{yo} \rightarrow /ʃəno/ \text{ 'gave birth'}$; $\text{kən}-\text{yo} \rightarrow /kəno/ \text{ 'hit'}$
 $\text{c}^{\text{h}}\text{ən}-\text{ɪ} \rightarrow /c^{\text{h}}\text{əɪ} \text{ 'dropped, sifted'}$; $\text{k}^{\text{h}}\text{ən}-\text{ɪ} \rightarrow /k^{\text{h}}\text{əɪ} \text{ 'lifted'}$

8.2.3.2. Root-final $\text{h} \rightarrow \text{h}/\text{t}^{\text{h}}/\text{t}^{\text{h}}/\text{d}^{\text{h}}$:

- $\text{kəh}-\text{yo} \rightarrow /kəhə/ \text{ 'attacked'}$
 $\text{ləh}-\text{yo} \rightarrow /lət^{\text{h}}\text{o}/ \text{ 'came down'}$
 $\text{pɪh}-\text{yo} \rightarrow /pɪt^{\text{h}}\text{o}/ \text{ 'grinded (transitive)'}$
 $\text{dʊh}-\text{yo} \rightarrow /dʊd^{\text{h}}\text{o}/ \text{ 'milked'}$

8.2.3.3. Root-final S → S/t^h/ t^h :

cus-yo → /cusyo/ 'sucked (mango)'

p^hla-yo → /p^hl^ho/ 'crushed'pis-yo → /pit^ho/ 'grinded (Intr.)'8.2.3.4. Root-final ʃ → ʃ/g^h :k^hʃ - yo → /k^hʃyo/ 'was lifted (intr.)'b^hʃ - yo → /b^hʃo/ 'ran, was broken (Intr.)'

8.2.3.5. Root-final a → a/at:

ga-yo → /gayo/ 'sang'; pa-yo → /pato/ 'wore'

8.2.3.6. Root-final U → U/Un/ot:

hu-yo → /huo^ho/ 'was'; ru-yo → /rūno/ 'wept'd^hu-yo → /d^hot^ho/ 'washed.'

8.2.3.7. Root-final y → In/it:

dy-yo → /d^hino/ 'gave'; py-yo → /pito/ 'drank.'

8.2.4. Past tense (masc.) suffix initial y → y/ø after the root:

- (i) y → y when the simple verbal root ends in vowel (other than U)
or any consonant other than stops.

ga-yo → /gayo/ 'sang (sg.)'

k^hol-ya → /k^holya/ 'opened (pl.)'

- (ii) y → ø after the modified verbal root (i.e. py → pit 'to drink,'
pis → pith 'grind', etc.) and simple word ending in U.

py-yo → /pito/ 'drank'

pis-yo → /pit^ho/ 'grinded'

hū-yo → /hūo/ 'was'

exceptions: han-yo → /h^hyo/ 'hit'k^ho^hn-yo → /k^ho^hyo/ 'lifted'

- (iii) y → y/ø when the simple word ends in a stop

w^hd^hyo → /w^hd^hyo/ 'increased'; b^had^h-yo → /b^had^ho/ 'tied.'g^hut^h-yo → /g^hut^hyo/ 'strangled' k^hut^h-yo → /k^hut^ho/ 'finished'8.2.5. Changes in non-initial position:

8.2.5.1. Initial p → w when non-initial:

pəñja - pəñjah → /pəñjwəñjah/ 'fifty five'

8.2.5.2. Initial c → t non-initial:

te - calihə → /tetalihə/ 'forty three'

8.2.5.3. Initial s → h non-initial:

səta - sətar → /səthatar/ 'seventy seven'

bə - sət^h → /bəhət^h/ 'sixty two'

8.2.6. Reduced Forms:

- 8.2.6.1. Second digit numeral: / d̥hə / '10', / wiə / '20', / t̥hə / '30', / calihə / '40', / sət^hi / '60' and / sətər / '70' - when prefixed by the first digit numeral and suffixed by cardinal morpheme <-ĩ> is reduced to non-syllabic or monosyllabic form;
- car - d̥hə - ĩ → / coḏhĩ / '14th(f.)'
- ḥə - wiə - ĩ → / ḥawhĩ / '22nd(f.)'
- pəñjə - t̥hə - ĩ → / pəñthĩ / '35th(f.)'
- sətə - c - calihə - ĩ → / sətetalhĩ / '47th(f.)'
- tə - sət^hi - ĩ → / t̥əhət^hĩ / '63rd(f.)'
- hiku - sətər - ĩ → / ekəhətrĩ / '71st(f.)'.

- 8.2.6.2. Two or three syllable -nominal root is reduced to one syllable, when used as verbal roots:

(C) V C V C (V) → (C) V C C

h̥imət^hə 'courage', h̥imt^h - a - In̥u 'to encourage'

əṭəkə 'hindrance', əṭk - əṇu 'to hinder, quarrel'

kawpr̥i 'anger', kawpr̥ - yo 'became angry'

8.3. Alternations in free variation:

- 8.3.1. e ∞ ɛ and o ∞ ɔ in initial and medial positions;

/ et̥u ∞ ɛt̥u / 'spinning, wheel', / peso ∞ pɛso / 'money',

/ oj̥u ∞ ɔj̥u / 'glory', / koro ∞ kɔro / 'bitter'.

- 8.3.2. Shift of the position of /h/: Sometimes initial or final /h/ is shifted to medial position.

/ h̥ɛro ∞ ɛh̥ro / 'such'

/ k̥eḥāh̥ ∞ keḥāh̥ ∞ k̥eḥāh̥ / 'where?'

8.3.3. Reduced forms in normal rapid speech:

- 8.3.3.1. Optional loss of /h/:

/ h̥Inə ∞ Inə / 'this(obl.)', / ḡalh̥i ∞ ḡal / 'matter, story'

/ ekh̥i ∞ eki / '21st(f.)'.

- 8.3.3.2. Optional loss of final /I U/ when occurring after a consonant;

/ rat̥i ∞ rat / 'night', / ker̥u ∞ ker / 'who?'

- 8.3.3.3. Optional loss of imperative suffix <-U> after a vowel ending -

verbal stem:

/ d̥^hoU ∞ d̥^ho / 'wash(sg.)', / .iU ∞ i / 'drink(sg.)',

/ k̥^haU ∞ k̥^ha / 'eat(sg.)'.

8.3.3.4. Three-four syllable word is optionally reduced to two-three syllables:

- / wIndUrəwəwIndrə / 'entertainment',
 / IštIharUwəIštəhU / 'hand bill',
 / xUdmətləbiwəxUdmətləbi / 'selfishness'.

8.3.4. External Sandhi: Two words are optionally combined in one.

8.3.4.1. ə/a + aəa :

- / nə + ahe /ə / nahe / '(It) is not'.
 / c^ha + ahIn /ə / c^hahIn ə c^haIn / 'What are (these)?'.

8.3.4.2. ə + aəə :

- / c^honə + ahe /ə / c^honhe / 'Why it isn't?'
 / kanə + ahIn /ə / kanhən / '(They) are not (present)'.

8.4. Ablaut patterns: Besides the morpho-phonemic changes, mentioned above, the relationship of many Transitive and Intransitive verbal roots is explained by following vocalic and consonantal ablaut patterns. ('/' denotes ' is replaced by ')

8.4.1. ə in Intr. root is replaced by a in Tr. root:

- mər- 'die' , mar- 'kill'
 c^həŋ- 'fall', c^haŋ- 'sift, shake down'.

8.4.2. Intr. i / Tr. e :

- mīr- 'get together', mēr- 'collect'
 rīrh- 'move, crawl', rēr- 'move (Tr.)'.

8.4.3. Intr. u / Tr. o :

- rūk- 'stop(oneself)', rok- 'stop(Tr.)'
 lūd- 'swing(oneself)', lod- 'swing(Tr.)'.

8.4.4. Intr. root final t or d / Tr. r (besides vocalic ablaut of U/o)

- tūt- 'break(Intr.)', tōr- 'break(Tr.)'
 būd- 'drown(oneself)', bōr- 'drown(Tr.)'.

- 8.4.5. Intr. root final s / Tr. h :
- kUs- 'get murdered(Intr.)', kUh- 'murder(Tr.)'
 pis- 'grind(Intr.)', , pih- 'grind (Tr.)'.
- 8.4.6. Tr. root final n, ñ or ñ / Intr. f³:
- c^hIn- 'pluck(Tr.)', c^hIf- 'get plucked(Intr.)'
 k^həñ- 'lift(Tr.)', k^həf- 'be lifted(Intr.)'
 b^həñ- 'break(Tr.)', b^həf- 'got broken(Intr.)'

³The shift in the direction of the ablaut pattern is significant, here. In other cases, mentioned above, the Intransitive root is the base, but in this case the Transitive root is the base.

Appendix 1.

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