Coarticulation in Pahari

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Abstract

Coarticulation is a process in which the movements of different articulators affect each other that in turn, brings a change either in the preceding or the following phonemes. As systematic linguistic study of regional languages in the state of AJ&K has not yet gained much importance, therefore, such phenomenon remained unexplored. The paper is an attempt to bring into focus the phenomenon of coarticulation in Pahari, a sister language of Urdu, spoken in the vicinity of Rawalakot. The paper focuses on two very common consequences of coarticulation i.e. assimilation and elision. More specifically, it addresses the issue of vocalic (vowel) assimilation at the lexical level while the process of elision both at the lexical as well as post lexical level for the above mentioned dialect of Pahari will be brought under light.

1. Introduction

All languages exhibit coarticulatory phenomena, though in varying ways. Coarticulation is generally defined as "the overlapping of adjacent articulations" (Ladefoged 1993, p. 55) or as two articulators "moving at the same time for different phonemes" (Borden and Harris, 1984, p.130). The coarticulatory process illustrates that the articulators are continually moving into position for other segments over a stretch of speech (Fletcher & Harrington, 1995). The result of coarticulation is referred to as assimilation which is viewed as a collection of all feature changing rules e.g. voicing, manner, place, tongue position such as

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high, low, etc. By the phonological rule of assimilation, a neighboring segment assumes some features of another and becomes more similar. Depending on the type of sounds undergoing assimilation, the process is insignificantly distinguished as vocalic and consonantal assimilations (Odden, 2005, p. 228-234). Vocalic (vowel) assimilations are those in which a vowel is assimilated. On the other hand, consonantal assimilations occur when an assimilator (whether a vowel or a consonant) exerts influence on a consonant. Interestingly, the process of assimilation involves 'direction'[4]. It means that the process may occur either to the right or to the left, which is called progressive and regressive respectively (Lass 1984, p. 171). For example, whenever a bilabial stop in Urdu comes after alveolar nasal /n/, its bilabial property assimilates into the preceding alveolar nasal, and /n/ becomes /m/ (Kiani, 2011). This type of assimilation is regressive as it works from left to right. This can be noted in words such as sanp 'snake' which is pronounced as samp.

/sanp/ → /samp/ (snake)

Hence, we can say that X ←Y is regressive assimilation.

Allophonic forms of '-s' in English are the best examples of progressive assimilation. For example, the morph '-s' is pronounced as /əz/ when it comes after a sibilant sound. It is pronounced as /z/ when it comes after a voiced sound (other than a sibilant) and /s/ when it occurs after a voiceless consonant (other than a sibilant). On the other hand, X → Y is progressive assimilation. There are two other kinds of assimilation that are rarely found in some languages, i.e. reciprocal where there is a mutual influence between the two sounds, and coalescence where two sounds can fuse completely and give birth to a different sound.

Like assimilation, another important characteristic of rapid speech is elision which refers to the disappearance of one or more sounds in connected speech

[4] Much recent phonetic research in the area of assimilation refers to coarticulation. In this field, the terms used in assimilation studies that are introduced above (regressive and progressive) are not usually used; it is more common to encounter the terms anticipatory and perseverative used (respectively) instead.

which would be present in a word pronounced in isolation; the effect is also found when rapid speech is compared with slow, careful speech. For example the alveolar consonants /t/ and /d/ are omitted when occur between two consonants as *'the ne**xt d**ay….'* becomes */ðə ˈneks ˈdeɪ/* in connected speech. Elision is not considered as a separate process from assimilation as far as coarticulation studies are concerned. It is simply an extreme result of coarticulation whereby two sounds are articulated so closely to each other that a sound or sounds between them are completely disguised.

2. Background and the Purpose of the Study

Pahari, the most ancient Indo-Aryan language, originated in the Buddhist reign in India and then spread to the rest of the subcontinent (Masoodi, 1987). Now, it is one of the widely spoken languages of Azad Jammu and Kashmir (AJ&K), Northern areas of Pakistan, India (from Nepal to Himalayas and Himachal Pardesh) and the Great Britain where it is spoken by migrants from India, Pakistan and AJ&K (Khan, 2012). Pahari was initially written in Landa script which is the form of Sharda[5], invented by Buddhists. With the demise of the Buddhist Empire, the style of writing started changing with the Greek invasion and it became Farsi from 1819 to 1846. Later, the script was replaced by Punjabi during the Sikh rule.

Since Pahari has not yet been the interest of linguists because of the lack of literature available, no authentic research work has been carried out to highlight salient features of this language. Nazir (1999) as cited in Khan (2012), argued for 38 consonants and 22 vowels with no diphthong in the phonemic inventory developed for Pahari. Contrary to him, Saghir (2003) as cited in Khan (2012), has mentioned 54 consonants and 19 vowels along with the minimal pairs that provide empirical evidence for the presence of diphthongs and tripthongs in the Pahari language. Contrary to Nazir (1999) and Saghir (2003), Khan (2012) argues for only 12 oral vowels (six short and six long), and he further claims that four

[5] Sharda was a Buddhist University which was situated in Neelum valley, near Muzaffarabad in the Kashmir region, in Pakistan.

out of six long vowels have their nasal counterparts too. His proposed inventory for Pahari consonants and vowels is as follows:

Table-2.1: Pahari consonantal Inventory (Khan, 2012: 25)

	Bilabial	**Labio-dental**	**Dental**	**Alveolar**	**Retroflex**	**Palatal**	**Velar**	**Glottal**
Stops	P b Pʰ		ʈ ɖ ʈʰ	t d tʰ			k ɡ kʰ	
Nasals	m			n			ŋ	
Fricatives		f v		s z		ʃ	x ɣ	ɦ
Affricates						tʃ dʒ tʃʰ		
Lateral				l				
Trill				r				
Flap					ɽ			
Glides						J		

Table 2.1 illustrates that there are 30 consonants in Pahari. It also indicates that, unlike Urdu, this language does not have aspirated counterparts of voiced bilabial, alveolar and velar stops /b/, /d/ and /g/ respectively. This has restricted the number of consonants to 30 only. Now, consider the devised quadrilateral for Pahari vowels proposed by Khan (2012).

The vowel quadrilateral in figure 2.1 exhibits the places of vowels in Pahari. Khan (2012) asserts that the four long vowels /i: /,/e:/, /a:/ and /u:/ have their nasal counterparts /ĩ:/,/ẽ:/, /ã:/ and /ũ:/ respectively while /æ:/ and /o: / do not have nasal counterparts. The focus of this study is to bring into light some important supra-segmental features of Pahari such as nasalization, assimilation, and elision which are collectively known as coarticulation, the discussion of segmental features is abandoned for this study.

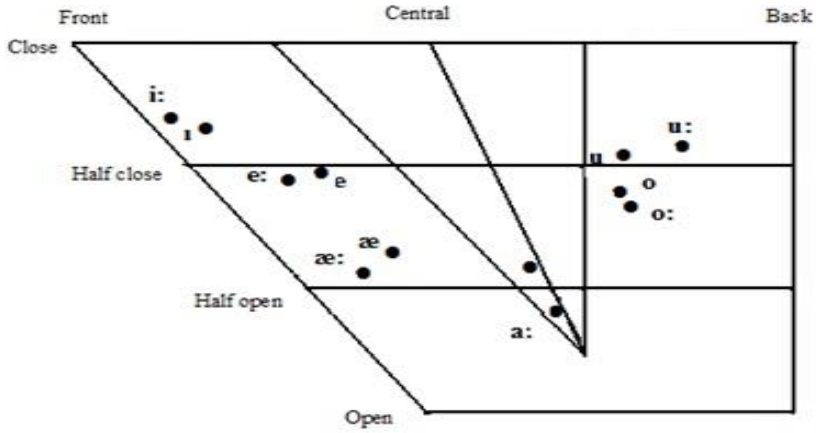

Figure-2.1: Pahari Vowel Inventory

3. Coarticulationin Pahari

Coarticulation occurs in almost all languages, and it tends to be stronger within syllables rather than across the syllable boundaries. The following section focuses on the phenomenon of coarticulation in terms of vocalic assimilation within syllables in Pahari.

3.1 Vocalic Assimilation in Pahari

Vocalic assimilation has been a common feature of languages spoken around the world. Pahari is not an exception in this regard. Like other languages, vowels that are adjacent to the nasal consonants in Pahari are nasalized. This refers to the fact that nasal consonants assimilate their feature onto the vowels, which is generally known as nasal assimilation or nasalization. The same is argued hereby for Pahari where only three out of six oral vowels exist in a nasal context and are nasalized. What follows in this paper will shed light on the nasal coarticulatory process in Pahari.

3.2 Nasalization in Pahari

Nasalization occurs mostly in the vicinity of nasal consonants in all the documented languages of the world. But the languages differ only in terms of the direction of assimilation. It means that some of the languages show regressive assimilation while others exhibit progressive assimilation. The commonly accepted universal rules of nasalization are given below:

i. V → [+ nasal] /__N (*Regressive nasalization)*

pen [pʰɛ́n] man [kæ̃n], now [naʊ̃ː] and wing [wɪ̃ŋ] →English

ii. V → [+ nasal[/ N __ *(Progressive nasalization)*

minto "I lie" [mĩtu], *manto* "coat" [mãtu] → Brazilian Portuguese

There are many languages (German) that exhibit both i.e. regressive as well as progressive nasalization. As discussed earlier, Pahari does not have nasal counterparts of short vowels; therefore, some of them are nasalized in a nasal context. However, all vowels are not nasalized in Pahari. It is quite interesting that out of six short vowels only three oral vowels are nasalized in Pahari. The data is given in the table below:

Table 3.1: Nasalization of Pahari short vowels (i, ə, ʊ)

/ɪ/	
gĩm	belly
Nĩn	take
Sĩŋ	smell
/ə/	
ʈʰə̃m	pillar
bə̃n	tie
ə̃ŋ	joint
/ʊ/	
hʊ̃m	bad smell
bʊ̃n	beneath/under

The data in table 3.1 indicates that the back high short vowel /ʊ/ does not exist before velar nasal /ŋ/ since no example could be traced for such context. It is also worth mentioning that the short vowels /e/, /æ/, /o/ were not found in the nasal context during the careful analysis of the corpus. Hence the nasalization rule in Pahari can be stated as below:

$$\begin{bmatrix} +Vowel \\ +Short \\ -Low \end{bmatrix} \rightarrow [+\text{Nasal}] \; / \; \_\_\_ \begin{bmatrix} +Consonant \\ +Nasal \end{bmatrix}$$

Consider the following table for further illustration:

Table-3.2: Nasalization of short vowel /I/ in Pahari

Sr. No.	Words	Meanings	Words without nasalization	Meanings
1	kʰĩŋla:	cone	nɪkka:	Short
2	mĩn mĩn	murmuring	mɪl	Meet
3	hĩn	take	mɪtʰa:	Sweet
4	sĩŋ	smell	nɪra:	Whole
5	gĩn	count	mɪtti:	Soil

The rule of nasal assimilation for / I / is as follows:

$$\textbf{Rule 1} \quad \begin{bmatrix} +Vowel \\ +Short \\ +Front \\ +High \end{bmatrix} \rightarrow [+\text{Nasal}] \; / \; \_\_\_ \begin{bmatrix} +Consonant \\ +Nasal \end{bmatrix}$$

The above rule states that the short high front vowel /ɪ/ is nasalized when it comes before a nasal consonant in Pahari. Now consider the following table for the examples that illustrate the nasalization of /ə/ in Pahari words.

Table 3.3: Nasalization of short vowel /ə/ in Pahari

Sr. No.	Words	Meanings	Words without nasalisation	Meanings
1	kə̃m	work	məl	Rub
2	kə̃n	ear	mək	Maize
3	ʧə̃m	kiss	nəɽi:	Neck
4	ʧə̃n	moon	nək	Nose

Table 3.3 provides evidence that /ə/ is nasalized when occurs before a nasal consonant. Moreover, the insight of the above tables provides empirical evidence that nasal assimilation in Pahari is regressive. In other words, the nasal coarticulatory process is anticipatory in the language. The rule for the above-mentioned examples can be formalized as:

$$\textbf{Rule 2} \quad \begin{bmatrix} +\boldsymbol{Vowel} \\ +\boldsymbol{Short} \\ +\boldsymbol{Central} \\ +\boldsymbol{Mid} \end{bmatrix} \rightarrow [+\text{Nasal}] \,/\, \_\_\_ \begin{bmatrix} +\boldsymbol{Consonant} \\ +\boldsymbol{Nasal} \end{bmatrix}$$

This rule can be summarized in the way that the short central mid vowel /ə/ is nasalized when it occurs before a nasal consonant.

In the case of / ʊ/, words such as bʊ̃n 'down' and sʊ̃n 'freeze' in Pahari also provide evidence that the vowel is nasalized when it is followed by a nasal consonant. Consider the following table for examples:

Table-3.4: Nasalization of short vowel /ʊ/ in Pahari

Sr. No.	Words	Meanings	Words without nasalisation	Meanings
1	hʊ̃m	bad smell	mʊkka	a blow
2	khʊ̃m	corn	mʊk	End
3	ʧʊ̃n	to pick	mʊl	Value

The rule for the above case can be expressed as under:

$$\textbf{Rule 3} \quad \begin{bmatrix} +\boldsymbol{Vowel} \\ +\boldsymbol{Short} \\ +\boldsymbol{Back} \\ +\boldsymbol{High} \end{bmatrix} \rightarrow [+\text{Nasal}] \,/\, \_\_\_ \begin{bmatrix} +\boldsymbol{Consonant} \\ +\boldsymbol{Nasal} \end{bmatrix}$$

This rule suggests that nasalization also occurs when the short back high vowel /ʊ/ precedes a nasal consonant either at the syllable or a word boundary. The whole discussion exhibits that in Pahari only three short vowels are nasalized, and this assimilation is always regressive. Unlike Urdu and English, Pahari long vowels have their nasal counterparts so the long vowels do not exhibit nasalization. The remaining part of this paper will explicate the phenomenon of elision in Pahari at post lexical level.

3.3 Elision in Pahari

Elision is also a feature of rapid speech which is seen in many languages of the world including English. In this phenomenon, either a vowel or a consonant that normally exists in isolated words or careful speech is elided during the conversation. The contracted forms of words such as can't, haven't, I'll in English are also regarded as examples of elision. Roach (2000) enumerates five ways in which elision can be traced out in any context. These conditions include loss of vowel, loss of consonant, contracted forms, syllable simplification and weak forms of the words. There are many examples of elision found in Pahari, which have been discussed in the present work.

3.3.1 Elision of Bilabial Plosive /b/

It has been commonly found in Pahari that /b/ is deleted when it comes after /m/. It is important to note that in careful speech, this phoneme shows its existence in the same context. Consider the following examples:

Table-3.5: Instances of Elision of bilabial plosive /b/ in Pahari

Sr. No.	Word	Production in rapid speech	Meanings
1	Gĩmb	Gĩm	Belly
2	Nĩmbu	Nĩmu	Lemon
3	khʊ̃mbey	khʊ̃mey	back side of a house
4	lʊ̃mba	lʊ̃ma	Cunning
5	tʃəmba	tʃəmã	a person with vitiligo
6	tʃʰʊ̃mbnã	tʃʰʊ̃mnã	cut into small pieces
7	tʊ̃mbnã	tʊ̃mnã	to mend
8	sʊ̃mbel	sʊ̃mel	black berry

Table 3.5 shows that /b/ is not pronounced in the Pahari words when it follows /m/ in connected speech. This can be written in the form of the following rule:

Rule 1 / b / → Ø / [m] ___

$$\begin{bmatrix} +Consonant \\ +Bilabial \\ +Stop \\ +Voiced \end{bmatrix} \rightarrow \emptyset \,/ \begin{bmatrix} +Consonant \\ +Bilabial \\ +Nasal \end{bmatrix} \_\_\_$$

Interestingly, it is the same phenomenon that can be observed in the English words bomb, tomb, comb, etc.

3.3.2 Elision of Short vowels in disyllabic Nouns

In Pahari, the elision of short vowels in disyllabic nouns is an interesting phenomenon. This language exhibits a distinctive case system where ergative, accusative, and dative case markers are the same.

Table-3.6: Case Markers in Pahari

Case	Masculine singular	Masculine plural	Feminine singular	Feminine plural
Ergative	-e	-ẽ	-a/i	-ẽ/i˜
Accusative	-e	-ẽ	-a/i	-ẽ/i˜

Dative	-e	-ẽ	-a/i	-ẽ/i˜

Table 3.6 shows that Pahari displays the same case marking for ergative, accusative, and dative entities. The following examples indicate the cases where these markers are attached to disyllabic nouns, containing a short vowel in the second closed syllable, the short vowel of the second syllable is elided:

Singular	**Plural**
dʒəñgʊt	dʒəñgte
dʒəñget	dʒəñgtẽ
kabotʊr	kabotre
kaboter	kabotrẽ
kukkʊr	kukkre
kukker	kukkrẽ
kukker	kukri
kukkri˜	kukkri˜

Note: feminine marker ‘a’ is not attached to disyllabic (closed) nouns.

Examples are given below for explanation:

1. dʒəñgt-e kabotre-kya pani Ditta
   boy-ERG pigeons-ACC water.Nom.M.Sg. give.PST.M.Sg.
   The boy gave water to pigeons
2. kukkr-ẽ Dane k^{h}ade
   hens-ERG feed-Nom.M.Pl eat.PSt.M.Pl

The hens took feed.

Contrary to the above examples, when these markers are attached to monosyllabic nouns or disyllabic nouns ending either with a long vowel or open syllable, no elision takes place. Consider the phenomenon below:

Table-3.7: Monosyllabic nouns

Monosyllabic Noun	**Meaning**	**Noun in Case**
mẽndʒ	Buffalo	mẽndʒi
Pa	excretion (of buffalo)	pai
tʃan	Moon	tʃane
tʃak	Bite	tʃake

Disyllabic Nouns containing a second open syllable

Molvɪ	religious scholar	molvɪ.e
motʃɪ	cobbler	motʃɪ.e

Disyllabic words containing long vowels in second close syllable

ʊsʈa:dˌ	ʊsʈa:dˌe
ferja:l	ferja:la:
sãʈ̪a:r	sãʈ̪a:ra:

After analyzing the above data following two rules can be formulated:

$$\textbf{Rule 2}\quad \begin{bmatrix} +\boldsymbol{Vowel} \\ +\boldsymbol{Short} \end{bmatrix} \rightarrow \varnothing \,/\, [+\boldsymbol{Consonant}]\_\_\_ \; [+\boldsymbol{Consonant}] \begin{bmatrix} +\boldsymbol{Short/Long} \\ +\boldsymbol{Hight} \\ +\boldsymbol{Front} \end{bmatrix}$$

$$\textbf{Rule 3}\quad \begin{bmatrix} +\boldsymbol{Vowel} \\ +\boldsymbol{Short} \end{bmatrix} \rightarrow \emptyset \,/\, [+\boldsymbol{Consonant}]\_\_\_ \begin{bmatrix} +\boldsymbol{Short/Long} \\ +\boldsymbol{Mid} \\ +\boldsymbol{Front} \end{bmatrix} [+\boldsymbol{Consonant}]$$

The evidence of rule 1 can also be found in the following section which discusses the elision of short vowel when diminutive suffix /ɪ/ is added with disyllabic nouns.

It seems that the short oral vowel /ɪ/ also serves as diminutive suffix in Pahari and its function is same as that of diminutive suffix /ette/ in English, e.g. kitchen → kitchenette.

Consider the examples below:

səm̃gʊl	səm̃glɪ	chain
kʰəmʊl	kʰəmlɪ	hole
gælʊn	gælnɪ	kind of pot
təm̃gʊr	təm̃grɪ	a dried bush with thorns
drəm̃ʊn	drəm̃nɪ	pasture

The data above triggers the formation of the following rule.

$$\textbf{Rule 4}\quad /\upsilon/ \rightarrow \emptyset \,/\_\_\_\, [+\boldsymbol{Consonant}][\imath]$$

3.3.3 Elision of Palatal /j/

When a singular feminine that ends with /ɪ/ is converted into its plural form, it takes a suffix which is transcribed as /jã/. However, it has been very carefully observed that in rapid speech /j/ is elided and the plural suffix is left only with /ã/.

Singular	Plural	Rapid Speech	Meanings
/kʊɽɪ/	/kʊɽɪjɑ̃ː/	/kʊɽɪɑ̃ː/	Girl
/gəɖɪ/	/gəɖɪjɑ̃ː/	/gəɖɪɑ̃ː/	Vehicle
/neɽɪ/	/neɽɪjɑ̃ː/	/neɽɪɑ̃ː/	Neck
/həɖɪ/	/həɖɪjɑ̃ː/	/həɖɪɑ̃ː/	Bone

3.3.4 Elision of the Prepositions Segments

Like other languages of the region, preposition plays a significant role in Pahari also. Since they are function words, they tend to lose some of their segments in connected speech. The prepositions in Pahari exhibit the following syllable structures:

1. CV ve (towards)
2. CVC bItʃ (in), bun (under)
3. CVCCV kə̃nne (with)
4. VCCVC ʊppær (at)

This study illustrates that in connected speech the monosyllabic preposition retains only its last segment if the preposition bears a CV pattern. It means that the initial consonant /v/ disappears in connected speech in Pahari and the preposition /ve/ becomes /e/ only. Consider the following example:

ʊs-ve dekh (slow/careful speech)

ʊs-e dekh (rapid speech)

3P.SG.OBL-towards look IMP

Look at him/her.

In case of monosyllabic preposition with CVC structure in Pahari as seen in bItʃ ‘in’, the syllable is contracted to the last consonant only and, the onset along

with the peak disappears if the peak does not contain a back vowel (either long or short). Consider the following examples.

ɖʊɖ glɑ:se-bɪtʃ bɑ: (slow/careful speech)

ɖʊɖ glɑ:se-tʃ bɑ: (rapid speech)

milk glass-in put.IMP

Put the milk in the glass.

However, if the peak of the syllable carries a back vowel (long or short), only onset disappears in monosyllabic prepositions, especially in CVC structure. See the examples below:

kɪʈɑ:vɑ:-bʊn ke ɖɑ: (slow/careful speech)

kɪʈɑ:vɑ:-ʊn ke ɖɑ: (rapid speech)

book.OBL-under what be.PRES.M.SG

What is there under the book?

ʊs-ko:l ke ɖɑ:

ʊs-o:l ke ɖɑ:

3P.SG.OBL-with what be.PRES.M.SG

What does she/he have?

The examples above are good enough to justify the claim that monosyllabic prepositions are greatly affected by the process of co-articulation in rapid speech and hence capable of retaining only V or VC segments. In case of CV, it retains the peak while in case of CVC, it appears with coda (final consonant) but

only if the peak does not contain back vowel as back vowels permit the deletion of onset only.

Interestingly, the same pattern is found in the Pahari disyllabic prepositions. However, it is noteworthy that the operation is quite straightforward in the sense that it is the second syllable that retains either its coda or a complete chunk. For example, the preposition ʊppær 'on' retains the coda of the last syllable only in VCCVC structure. This can be observed in the following example:

kɪʈɑ:v	bĩde:- ʊppær	rəkʰ	(slow/careful speech)
kɪʈɑ:v	bĩde:- r	rəkʰ	(rapid speech)
book.NOM	stool.OBL-on	put.IMP	

Put the book on the stool.

The rule suggests that during rapid speech, the preposition with VCCVC syllable structure just retains the coda of the second syllable.

In some other cases of disyllabic prepositions in Pahari, the last syllable remains unaffected while the first syllable completely disappears by the process of co-articulation especially in CVCCV structure. Consider the following examples:

se:b	ʧʰurja-kə̃nne	kəp	(slow/careful speech)
se:b	ʧʰurja-ne	kəp	(rapid speech)
apple.NOM	knife.OBL-with	cut.IMP	

Cut the apple with the knife.

kʊɽjɑ:-pɪʧʰe:	kʊʈɑ:	ləɣjɑ:	(slow/careful speech)
kʊɽjɑ:-ʧʰe:	kʊʈɑ:	ləɣjɑ:	(rapid speech)

girl.OBL-back dog.NOM chase.PST.M.SG

The dog chased the girl.

It can be summarized that in Pahari rapid speech, both the monosyllabic as well as disyllabic prepositions are affected by the process of coarticulation. Moreover, the data also indicates that Pahari prefers to have a coda in syllable structure. This refers to the fact that it is the onset that normally disappears in such processes.

4. Conclusion

To conclude this account of connected speech and coarticulation, it is argued that the process of coarticulation is worth investigating in Pahari as it has unfolded some very interesting facts regarding rapid speech. Pahari exhibits instances of regressive coarticulation,. This articulatory modification of speech sound is rule governed; for example, vocalic assimilation occurs only at the lexical level while the process of elision appears both at the lexical as well as post lexical level. Besides, out of six short vowels only three oral vowels are nasalized in Pahari. The present study has focused on only a few aspects of coarticulation, which still need to be investigated in detail. Hopefully, this very first step will open new avenues for future research in this area.

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