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Vowel Epenthesis as a Modification Strategy used by Pahari ESL learners: An Acoustic Study

ABSTRACT

This study aims to present a comprehensive acoustic study of epenthesis as a modification or simplification strategy used by Pahari ESL learners. The data are collected from ten participants by providing a list of English words containing a different combination of manner and place of articulation at onset and coda positions. Praat software is used for the acoustic analysis of the data. The study shows that Pahari learners use anaptyxis, or split pattern including insertion of /ɪ/, /e/, /ə/ and /ʊ/ at onset and coda positions while dealing with clusters which are not found in their language. In Pahari, /bl/, /kl/, /kr/, /gr/ clusters are present at onset position, but the learners face problem in pronunciation of these clusters. Similarly, some clusters are not found in Pahari, but learners pronounce them easily. The factors that affect English acquisition of clusters by Pahari learners can be explored in future research.

Keywords: Anaptyxis, epenthesis, ESL Learners, Consonant clusters, interlanguage

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Introduction

Pahari and English are two different varieties of language, and these languages have two different kinds of phonological systems and have different syllable structure patterns. This current study investigates the use of epenthesis of a vowel by the Pahari learners of English while learning consonant clusters of English at the onset and coda positions. This study also examines the process of resyllabification done by the Pahari learners for declusterization of English clusters that are not found in their language.

According to Saidat (2010), English syllable structure is shown by the formula: (C)(C)(C)V(C)(C)(C) (C), which means that English permits a maximum of three consonant clusters at onset and four consonants at coda position. According to Khan (2012), Pahari allows only two consonants at both onset and coda position. Pahari speakers were observed while employing different strategies when they learn clusters of English like metathesis, epenthesis, fortition, spirantization, deletion, approximentization and lenition. So the current study aims to investigate the epenthesis as a modification strategy used by the Pahari speakers.

Review of Related Literature

Different researchers have argued that speakers use vowel epenthesis as a simplification strategy while learning syllable structures that are not found in their language. According to Wiltshire (2006), different factors interact while acquiring a second language. These are the pattern of the first and second languages, universals of language acquisition and the amount and types of Exposure to the L2. Previous research discussed learners' difficulties in terms of sonority difference, markedness, native language transfers, and markedness.

Wiltshire (2006) pointed out that the transfer of a native language is one of the essential factors in acquiring a second language. Large numbers of studies are conducted on the role of native language transfer in the acquisition of consonant clusters in a second language (Wiltshire 2006; Prihantoro, 2012). Broselow (1987) stated that when speakers of the English language learned Arabic, they allocated the first consonant of the word-initial cluster to the last syllable of the preceding word ending in a vowel. He explained that modifications of these types occurred even speakers are familiarized with these words. A contrastive analysis hypothesis was also used by him. This explained that rules of English syllabification were used by learners to learn Arabic. These learners also transferred native language morphology during the acquisition of a nonnative combination of clusters.

Dupoux, Kakei, Hirose, Pallier and Mehler (1999) stated that the Japanese language does not allow consonant clusters, and they break

consonant clusters by inserting a vowel between them. They inserted vowel /ʊ/ or /o/ after every final syllable consonant except nasal consonant. These are the following possibilities of vowel insertion in loan words in the Japanese language. The first possibility is that these speakers have lost or are unable to develop the ability of articulation of consonant clusters, and this phenomenon is raised in speech production. And the second possibility is orthography as well. According to Jabeen, Mehmood & Asghar (2012), resyllabification of consonant clusters occurred according to the phonological grammar of the native language of the speaker.

Saidat (2010) stated that there are certain English syllables that pose problem for Arab learners who learn English. They declusterize the clusters by inserting high front short vowel /ɪ/ for example, /sɪblʃ/ splash. There are large numbers of consonant clusters of English that are not found in many languages at onset and coda position (Lee, 2006). So, deletion or insertion strategy is applied in dealing with these foreign words in order to conform with the native vowel and consonant system and syllable structure.

Jabeen, Mehmood and Asghar (2012) stated that L2 users of a language respond mainly in two ways while dealing with clusters not found in their language. Sometimes they inserted a vowel, or either they deleted it.

Jabbari et al. (2012) studied different strategies used by Parsian learners in dealing with English consonant clusters at the initial position. The result showed that vowel epenthesis is the most common strategy applied by the learners. The epenthetic vowel is inserted in a different location.

According to Boudaoud and Cardoso (2009), Persian speakers use the phenomenon of e- epenthesis at the onset position when producing three homographic SC consonant clusters (/sl/,/st/, and /sn/) clusters.

Odeh and Al Zuoud (2019) have investigated the production of English consonant clusters by Arabic native speaking students. The findings showed that phonetic and phonological pattern of first language played a significant role in making errors in production of consonant clusters of English. Epenthesis of short vowel is observed by the majority of the participants. It also showed that epenthesis of short vowels effected morphology of certain words negatively for example train is produced as /tɛˈreɪn/ and state as /ɛ ~ steɪt/.

Habib and khan (2019) studied the epenthesis of vowels employed by Punjabi learners of English in dealing with the consonant clusters at onset position. English and Punjabi are two different kinds of languages according to their phonological system. Distinct feature theory and CV phonology is used for the analysis. The result showed that Punjabi learners inserted vowels according to the Punjabi phonological system in dealing with English consonant clusters. They used an additional node of vowel and resyllabified the clusters. The /ə/ vowel is considered as the default epenthetic vowel. They also inserted /e/ before the consonant clusters in some cases.

Tabussam (2003), Karnai (2007), Abbasi (2010) and Khan (2013) also worked on the phonology of Pahari. Khan et al. (2012) studied problems of pronunciation confronted by Pahari speakers while learning consonants of English. The results showed that four consonants were not pronounced properly by Pahari learners. They replaced dental voiceless fricative /θ/ with dental voiceless stop /t̪ /, dental voiced fricative /ð/ with dental voiced fricative /d̪ /, Bilabial approximant /w/ with labio-dental fricative /v/ and Palato-alveolar voiced fricative /ʒ/ with palatal approximant /j/. Similarly, Shafi (2017) has studied the Phonological analysis of English loan words in Mirpuri Pahari. No previous work has been done on the modification strategies used by Pahari ESL learners while dealing with English consonant clusters. The discussion above showed that in different languages, ESL learners applied different modification strategies while learning consonant clusters. It has also been observed that certain modifications are done by Pahari speakers in interlanguage syllable structure because they face problems in pronunciation of those words. They insert certain vowels and break the consonant cluster at both initial and final positions. There are some other types of modification like fortition, deletion, metathesis, etc. applied by learners and it results in resyllabification. The focus of this study is only on epenthesis as a simplification strategy used by learners in dealing with clusters not found in their language.

It also validates the previous claim that vowel epenthesis is the most prominent characteristic of Pakistani English. Specific to this paper, it adds more to the research made, particularly on how ESL learners whose first language is Pahari produce the English consonant clusters epenthesized. The clusters /kl/, /bl/, /kr/ and /gr/ are found in this language but these clusters pose pronunciation problems for Pahari learners. The fricative-fricative, liquid-stop cluster, voiceless alveolar fricative and stop, nasal-alveolar-stop, and voiced bilabial stop-fricative are not present in Pahari, but they do not pose any problem.

Methodology

Research Design

Both quantitative and qualitative method is used in this study. Speakers are given the word list and asked to pronounce the words three times. Learners are also observed in pronouncing words of the English language during fieldwork. It is a qualitative study. For confirmation of epenthesis as a simplification strategy, Acoustic analysis is done. So, this is a quantitative study.

Participants

Ten Pahari ESL learners (5male and 5female) were selected for this study. They were given a list of English words and were asked to pronounce them

three times. The participants were 17 to 25 years old and of intermediate level. They have learned English at both school and college levels.

Stimuli

Learners were provided with a list of words (given in Appendix) containing clusters at the word's initial and final positions, and they were examined on the basis of cluster types. Cluster types are different combinations of manners and place of articulation of adjacent consonants, which are as follows:

Table 1
Types of Clusters

	CC Onset Clusters	
Voiceless Stop + Liquid Fricative + Glide Stop + Glide	Fricative + Liquid Fricative + Nasal	Voiced Stop + Liquid Fricative + Semivowel
Fricative + Stop + Liquid	**CCC Onset Clusters**	
	CC Coda Clusters	
Nasal + Liquid + Nasal	Stop + liquid	Stop + Nasal
	CCC Coda Clusters	
Stop + Fricative + Stop		

Data Collection and Analysis Procedure

Praat Software is used for collection and analysis of the data and Acoustics Analysis is done to conform epenthesis of vowel as the simplification strategy.

Results and Discussion

Vowel epenthesis or split pattern is most commonly used strategy by learners while learning clusters that are not found in their language. Pahari ESL learners inserted four different types of vowels in learning clusters, these are /ɪ/, /e/, /ə/ and /ʊ/.

Insertion of /ɪ/

Stop + Liquid

In stop and liquid combination of clusters following sound /ʊ/, Pahari speakers inserted /ɪ/ sound between and after the clusters. For example, blue /blu:/ monosyllabic word is uttered or pronounced as /bɪlɪu/. This showed that monosyllabic word is resyllabified as three rather than one syllable. So, split pattern or epenthesis is the most commonly used strategy by speakers

to resolve stop and liquid clusters. Few examples and their spectrographs are given below.

Words	RP Transcription	Pahari Transcription
Crew	kru:	kɪrɪu
blue	blu	bɪlɪu

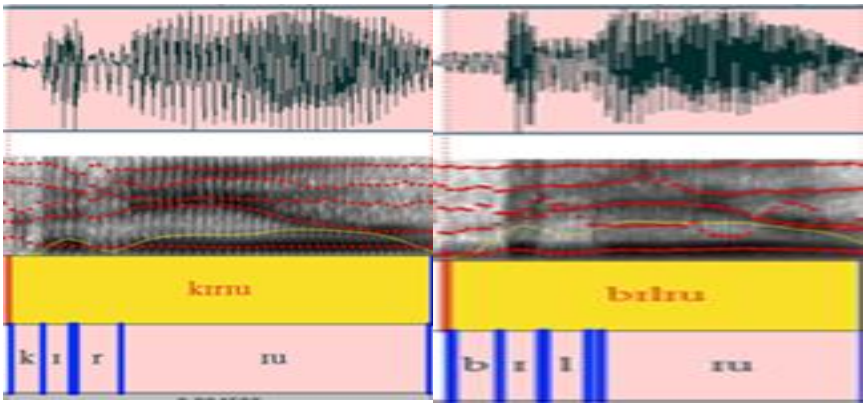

Figure 1: Insertion of /ɪ/ Sound in 'Crew' and 'blue'

In case of voiced stops and liquid /r/ clusters, it has been observed that speakers inserted vowel sound, whether these clusters followed /u/ sound or not for example green /grɪn/is pronounced as /gɪrɪn/. This phenomenon is observed in examples given beloW.

Words	RP Transcription	Pahari Transcription
Grim	grɪm	gɪrɪm
Grumble	grʌmbl	gərəmbʊl/ gəra:mbel

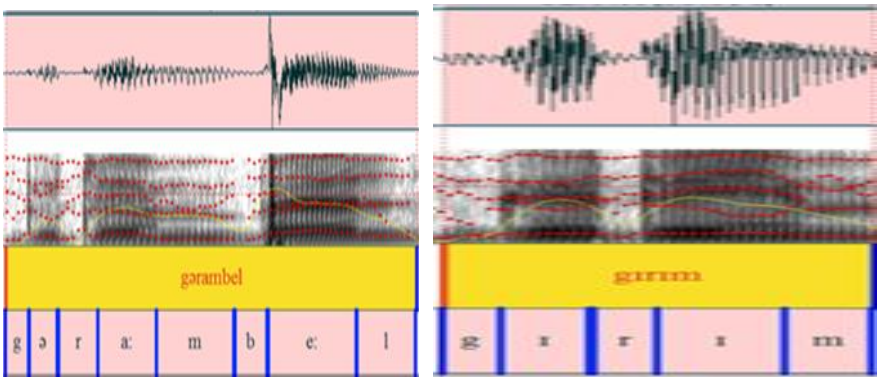

Figure 2: Insertion of /ə/ and /ɪ/ in 'Grumble' and 'Grim'

Fricative /stop + Glide /w/

Pahari speakers insert sound /ɪ/ on stop or fricative and glide /w/ combinations. The glide sound /w/ is repaired with /v/fricative. This sound /w/ is not in Pahari. It has also been observed that there is harmony between vowel epenthesized and the vowel following the combinations.

Words	RP Transcriptio	Pahari Transcription
Gwin	gwɪn	gɪvɪn
Tweek	twi:k	tɪvɪ:k

Stop/ Fricative + Semivowel /j/

Pahari speakers face difficulty in learning stop /fricative and semivowel /j/ combination. They inserted vowel sound /ɪ/ and modified /j/ into /ɪ/ sound at onset position. For example Beauty/bju:tɪ/ is pronounced as /bɪʊtɪ/.

Words	RP Transcription	Pahari Transcription
Pew	pju	pɪʊ
Few	fju	fɪʊ
View	vju	vɪʊ

Fricative + Stop + Liquid

Three consonant clusters are not allowed in Pahari at onset position. In case of fricative stop and liquid combination, they epenthesize /ə/ and /ɪ/ sounds

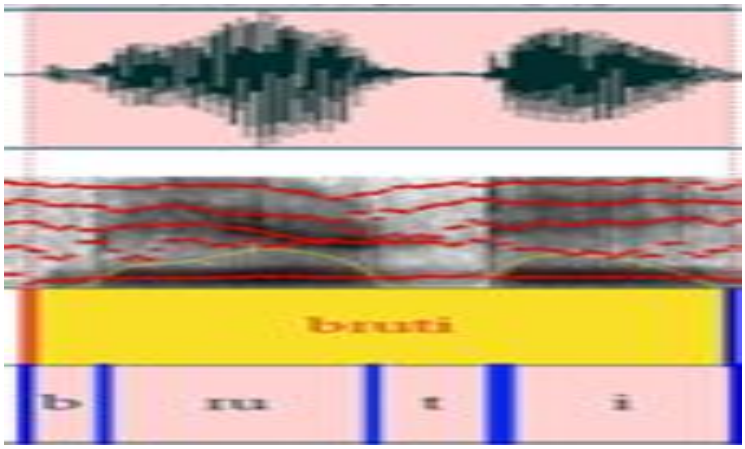

Figure 3: Modification of / j/ into / I/ in 'beauty'

Words	RP Transcription	Pahari Transcription
Spring	sprɪŋ	sɪprɪŋ
Struggle	strʌgl	sətrəgʊl
Straw	strɔ	sətra:

Insertion of /ə/

Fricative + Liquid

There is no problem for learners in fricative and liquid combinations they epenthesize /ə/ sound when these clusters are followed by diphthong. For example /fraitnd/ and/braibd/ are pronounced or articulated as /fəraitənd/ and /bəraibd/.

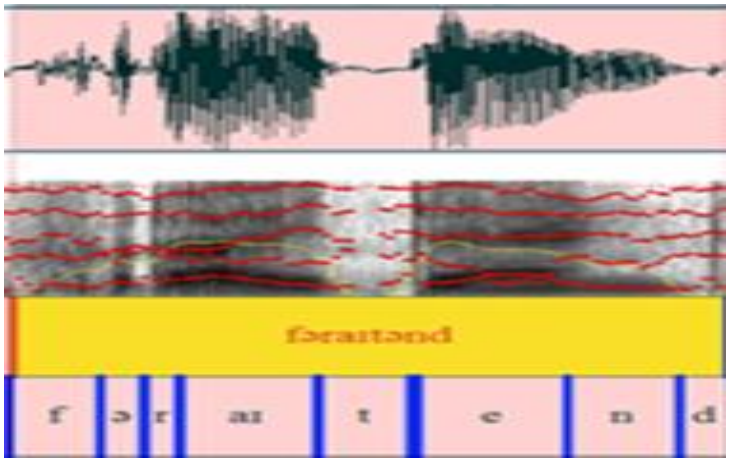

Figure 4: Insertion of /ə/ in 'Frightened'

Liquid + Nasal

Pahari allows only 5 types of clusters at coda position. So, it is difficult for learners to learn different combination at coda position. Pahari speaker insert /ə/ sound in liquid and nasal clusters. For example, film /film/ is pronounced as /filəm/ and horn /hɔrn/ is pronounced as /harən/.

Fricative+ Nasal

This cluster combination is not found in Pahari and learners epenthensize /ə/ sound. For example, Equation /ɪkweɪʒn/ is pronounced as /ɪkveʃən/. Similarly Solution /səlu:ʃn/ is pronounced as /səlu:ʃən/ and Translation /trænsleiʃn/ is pronounced as /trænsleiʃən/.

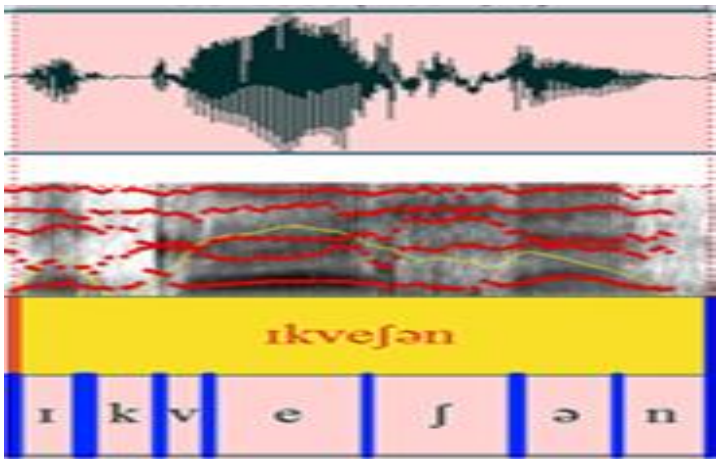

Figure 5: /ə/ Sound insertion in 'equation'

Stop + Nasal

Pahari speakers face problems of pronunciation in Stop and nasal clusters because these clusters are not available in Pahari. For example, sudden /sʌdn/ is pronounced as /sədən/ and Button /bʌtn/ is pronounced as /betən/

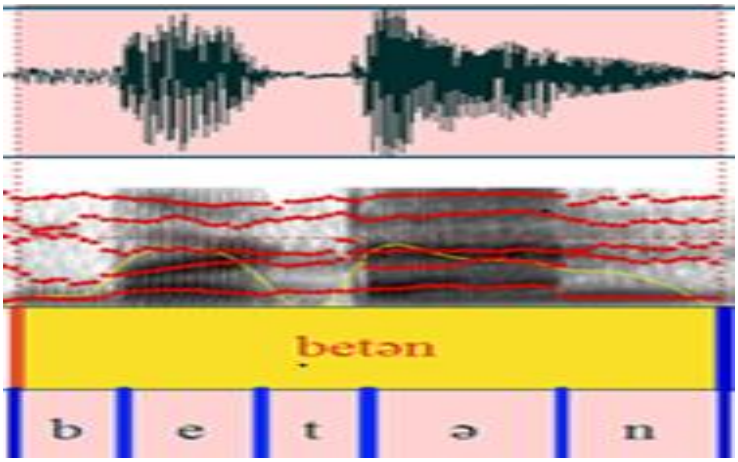

Figure 6: /ə/ Insertion in 'button'

Stop + Nasal + Stop

The stop nasal stop clusters create problem of pronunciation for the learners. Pahari speakers inserted /ə/ sound between stop and nasal because clusters like stops and nasals are not permissible in Pahari. For example, Frightened is pronounced as /fəraitənd/

Insertion of /ʊ/

Stop + Liquid

Pahari speaker insert /ʊ/ sound between stop and liquid clusters. For example, Possible /pɒsəbl/ is pronounced as /pəsɪbʊl/ and principle is pronounced as /prɪnsɪpʊl/

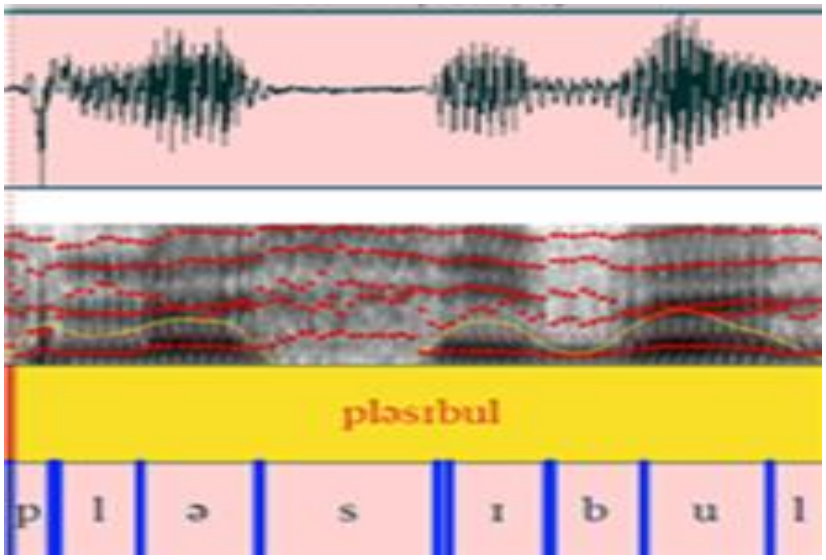

Figure 7: Insertion of /ʊ/ in 'Plausible'

liquid + Stop + Liquid

Three consonant clusters are not allowed in Pahari language at coda position. They inserted different sounds in these clusters. In liquid stop liquid clusters, they insert sound /ʊ/between stop and liquid because it is not present in this language. For example /grʌmbl/ is pronounced as /gərmʌbʊl/.

Stop + Liquid + Fricative

Words	RP Transcription	Pahari Transcription
Spectacles	spektəklz	spektækʊlz
Sparkles	spɑ:klz	spa:rkʊlz

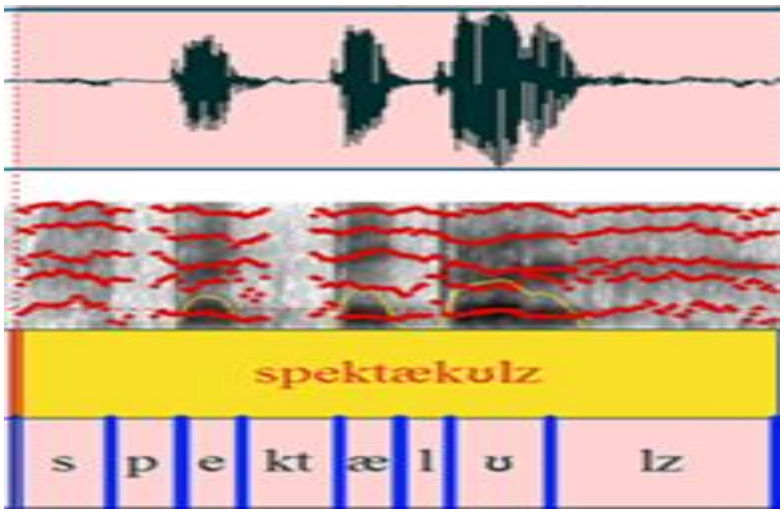

Figure 8: /ʊ/ Insertion in 'Spectacles'

Insertion of /e/

Nasal + Liquid

In the acquisition of Nasal and liquid Clusters, learners inserted /e/ sound.

Words	RP Transcription	Pahari Transcription
Criminal	krɪmɪnl	kɪrɪmɪnel
External	ɪkstɜ:nl	ekstærnel

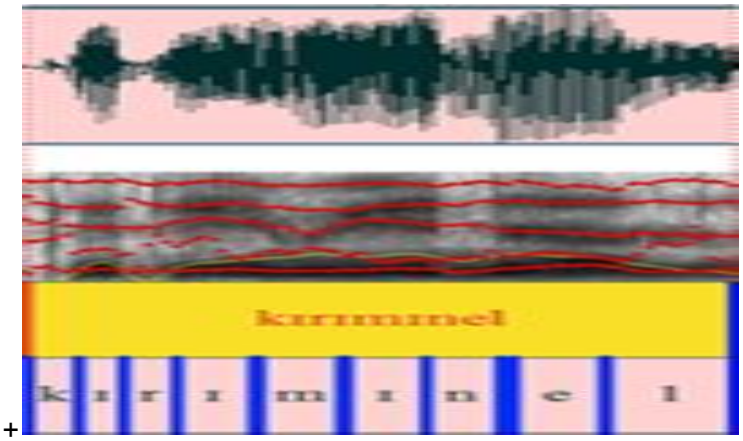

Figure 9: Insertion of /e/ in 'Criminal'

Stop + Fricative + Stop

The speakers of Pahari have broken clusters combination /dst/ and put a vowel between the /d/ and /s/ consonants because /d//s/ is not present in Pahari.

Words	RP Transcription	Pahari Transcription
Midst	mɪdst	mɪdest
Oldest	əʊldst	Oldest

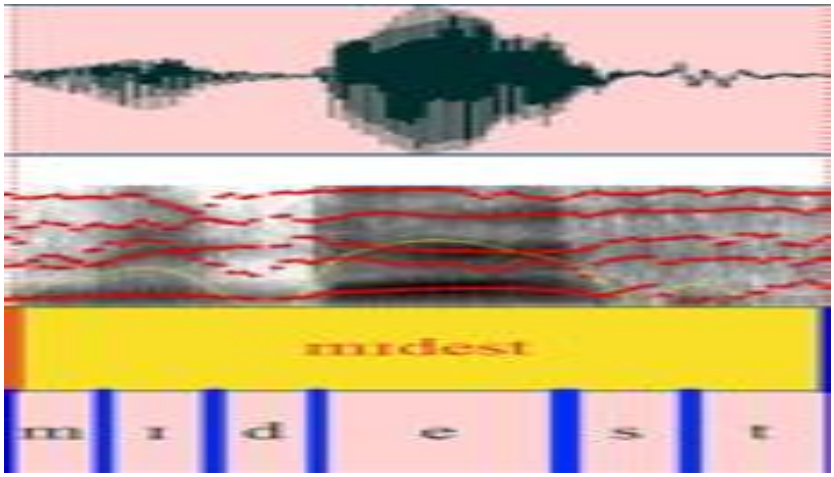

Figure 10: Insertion of /e/ in 'Midest'

Conclusion

The whole discussion given above showed that epenthesis is the most frequently used simplification strategy by learners to deal with clusters that are not present in their native language. There are four different vowels /ɪ/,/ə/ /e/, and /ʊ/which are inserted by Pahari speakers between those clusters, which are challenging to learn.

In the case of fricative/stop and liquid, fricative – nasal and liquid- nasal clusters, vowel /e/ is inserted at coda position because these are not allowed in Pahari language. Three consonants combination of clusters is not possible in Pahari language. They modified these clusters according to the parameters of their first language.

In the case of stop- nasal -stop clusters, /e/ is epenthesized between stop and nasal cluster as /fraɪtnd/ is pronounced as /fəraɪtend/. In Pahari language /nd/ cluster is presentt. Insertion of /ʊ/ sound is taken place between stop-liquid and liquid –stop- liquid clusters. The /e/ sound is epenthesized between nasal- liquid and stop –liquid- stop +clusters.

There are a few clusters that are present in both Pahari and English at the onset position, but learners are unable to pronounce them correctly. These are /kl/, /bl/, /gr/, /kr/ clusters. When learners are dealing with stop and liquid clusters, which are followed by the/u:/ sound, they insert/ɪ/ vowel. In voiced stop and liquid /r/ combination, learners inserted /ɪ/ vowel whether these combinations followed /u:/ sound or not. In fricative or stop and glides combination /ɪ/ is inserted and modified /w/ into /v/ sound and /j/ into /ɪ/ sounds.

Epenthesis or Anaptyxis resulted in the re-syllabification of words. The monosyllabic word is syllabified into two or three syllables. For example, /grɪm/ is pronounced as /gɪrɪm/. Pahari doesn't allow more than two consonant clusters at onset and coda position. For example, /braitnd/ a monosyllabic word is pronounced as /bəraitənd/. As a result, a monosyllabic word is changed into a trisyllabic word. So, the re-syllabification is done by learners according to the Pahari parameter.

Similarly, there are a few clusters that are not allowed in Pahari, but speakers pronounced them correctly. For example, /difficult/ and /help/ are pronounced as /dɪfɪkʊlt/ and /help/. The liquid-stop, fricative-fricative, voiceless alveolar stop and fricative, voiced bilabial stop-fricative, and nasal-alveolar-stop are not allowed in Pahari, but they did not pose any problem.

To some extent native language transfer also played a role in the acquisition of consonant clusters in Pahari language. But we cannot say that it totally depends on native language transfer. Some other factors played their role in the acquisition of English by Pahari learners because there are a few clusters that are present in Pahari. Still, learners faced difficulty, and there are few clusters that are not present in this language, but they do not pose any problems. So, other factors which played their roles in the acquisition of English by Pahari learners are unexplored in this study. These may be due to orthography. These factors can be explored in future research as well.

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Appendix

CC ONSET CLUSTERS		
Voiceless Stop + Liquid Precursor prejudice Plausible Plagiarism Clue Crew	**Voiced Stop + Liquid** Bless Blue Blinking Glue Grumble Grim	**Fricative + Liquid** Flourish flask Frequent Frightened Slaughter Shrinkage
Fricative + Nasal Smuggling Snobbish	**Fricative + Glide** Thwart Swollen	**Stop + Glide** Gwen Tweek
Stop + Semivowel Pew Beauty	**Fricative + Semivowel** Few View	
CCC ONSET CLUSTERS		
Fricative + Stop + Liquid Spring String Struggle		
CC CODA CLUSTERS		
Nasal + Liquid Criminal	**Stop + nasal** Button	**Stop +liquid** Principal Cycle
CCC CODA CLUSTERS		
Stop + Fricative + Stop Welshed		