Vol. 6, Issue 1, 2026 (January – March)
ISSN 2710-4532 (Online) ISSN 2710-4524 (Print) ISSN 2710-4540 (ISSN-L)
Journal of Educational Research & Social Sciences Review (JERSSR)

Acoustic Analysis of Pronunciation errors of High School Students of Sheikhupura

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Abstract

A journey towards learning English as a Foreign Language is a hard task for every student at the age of Secondary School, especially the Public Sector. There are many effective filters involved as a hurdle in their learning process. It is deeply observed that reading and writing are given emphasis but communication skills are always kept behind. It is a common phenomenon that learners of L2 English make errors on the way of learning a new set of characters. Proper methods of teaching and learning material can overcome these errors but the errors in pronunciation of students seem a hurdle which hardly known by the students and even the teachers themselves. For this purpose, an extensive phonemic study of English Language is conducted to investigate the pronunciation errors which are occurred by the strong influence of Punjabi Language. The focus of this study is on pronunciation errors of matriculation level students from the five public schools in Sheikhupura. The data is collected in the form of audio recordings which are later analyzed through acoustic analysis with the assistance of PRAAT software showing those phonemes which enter from Punjabi. The results showed significantly prominent errors in the speech sounds of Punjabi speaking students in observation and in the recordings. This study will help future learners to know these errors and avoid them for better competency.

Keywords: Native Language, Second Language, Phonemic Interference, Pronunciation Errors, Distinctive Features, Acoustic Analysis.

Introduction

A language should be acquired in is true form and characters because it is the due right of a language system which maintains its identity. That's why it is important to maintain its originality. This study centralizes this issue of adapting a set of characters from first language and enter into another new language with same proficiency which can be achieve after some practices but the oral representation is not so easy to adopt by the native speaker in its true accent and pronunciation. Especially, when there is a matter of learning two widely different languages such as English and Punjab (Tariq, 2013).

A language has many forms as its described qualities but the most important is its spoken form to recognize it as a living language. In terms of linguistics, they produce a sound using their organ systems to make their language understandable for other people to interact with each other and exchange of ideas. Human speech organs collaborate to produce a sound comprised of two main categories; consonant sounds and vowels sounds. And, the systematic amalgamation of these consonants and vowels sounds is the reason for creating morphemes or words (MUIN, 2017). It categorizes a language into two main parts i.e. phonological structure and syntactical structure. The difference between both structural levels is described by many researchers.

At one level, proficiency in communication, increases confidence in native speakers to interact in a foreign language to develop them socially and linguistically. And on the other level, poor pronunciation put a mask on learners other language skills condemning them towards failure in the social circle and academic advancements (Fraser & Perth, 1999). That's why this facet of language learning cannot be ignored. It is crucial because pronunciation is the first thing to be noticed about language learner. This is the critical reason for selecting this side to be investigated. Especially, for those students who are Punjabi speakers and unable to recognize their errors in English pronunciation to correct them and not feel competent in speech delivery and presentations. Pronunciation errors not

only affect communication but create other errors too, Such as spelling errors. The native speakers often write spellings according to their own pronunciation. Reversely, the spellings affect pronunciation i.e**.** *debt, dough, laugh, lieutenant,* etc. the pronunciation is based on the written form so these words are spoken according to their spellings (Zarka & El Said, 2013). He further states about the (*tio*) spellings sound as (*ʃ*) as a confusing sound for a native speaker. Focusing these examples, unveil the fact that the letters in the English language are not related directly to their sounds. In other words, they don't have one to one connection with each other. As far as the second language is concerned, especially the English language having the status of global language, the L2 may consider a language of need. The English language has international worth that's why it is important to learn. There are more than 60 locally spoken languages in different areas of Pakistan. Urdu has the status of national language but the status of English as an international language is as bright as daylight (Akram & Mahmood, 2007). It is a fact that the world is a globally connected through latest technologies but the English language is one of the significant reason behind making it understandable for others (Tariq, Bilal, Sandhu, Iqbal, & Hayat, 2013).

Punjabi is spoken by a large population in Pakistan with its various dialects i.e. Lehandi, Pothohari, Multani, etc. According to Encyclopedia Britannica, the Punjabi belongs to the Indo-Aryan family and it has more than 30 million speakers. All other Punjabi dialects are different in its lexical and phonological aspects. There is a difference in the orthographical system in Shahmukhi and Gurumukhi but spoken Punjabi is nearly the same in India and Pakistan. The most prominent characteristic of Punjabi is its tonal quality, which causes variation in pitch and creates a disagreement in the meaning of a word (Karamat, 2001). This is the reason that the Punjabi language is phonologically unique, contrastive and complex to discover.

The idea behind this study is the observed difficulty faced by the students of grade 9 &10 (Secondary level). They can write an English essay or a topic of reasonable length but whenever they are asked to explain that topic or to discuss it in the class they remained backstage. And, when they are asked the reason behind this incompetency, they told that they would be more comfortable if they would be asked to speak in a native language. Denizer explains, "In the English language, the most challenging part was grammar, while the most difficult and influenced skill was speaking". The purpose of this study is to find out the instances of L1 in L2. This study will explore the phonological errors made by secondary school students due to the interference of Punjabi being their mother language. This study will also bring out an interesting comparison between Punjabi and English. Most of the literature was available on this aspect of the English language in Pakistan, that's why its purpose is to provide practical information to the teachers and students learning L2.

Literature Review

This research aims to point out how Punjabi native speakers at the secondary school level find it difficult to communicate in English because of phonological errors. In order to better understand those transferred phonological features, this chapter clears the role and impact of native language in learning English as a Second language. Phonological errors have been widely observed as a communication barrier in student learning and academic development. Brown admits in the study of (Fatemi, Sobhani, & Abolhassani, 2012) that there can be lots of reasons for which sometimes conversation may lead to failure but pronunciation is considered the most prominent among them.

Phonology

Trubetzkoy, 1969 proposes to define phonology that it is a systematic use of sounds in a specific human language. This systematic use consists of prosody and segments. There are three major classes of phonological analysis to find errors in speech. These are segments, features, and syllables. Phonology is not a single dimension of a language; it is comprised of morphological, lexical, pragmatics and syntactical aspects too. Phonology brings out those rules which specify the interacting sounds.

The phonology of a language is significant because it provides us a critical understanding of sound patterns uttered by a native speaker. It detects the characteristics of the phonemes in a particular language to differentiate through its quality, intensity harshness and other particular features (Kenstowicz, 1994).

Phoneme

A phoneme is any distinct and smallest unit in our perception that helps to distinguish a word from other specific words. It is an abstract unit of sound, e.g. */k/* as velar sound in *cool* and */k/* as palatal in *keel*. Its definition has two views;

(a) *American Structuralists Tradition*: It has defined phoneme according to its environment and allophones.

(b) *Generative Tradition:* It shows phoneme as a set of distinctive features.

(Zec, 2018) in his book on 'sonority constraints' and 'prosodic structure' proposed about phonemes. He delineated that a phoneme is a distinguishing unit for a word that can be pronounced in one way or the other depending on the number of allophones. To generalize phonological rules, the distinctive features of a phoneme help a researcher to perceive and interpret the accent of a word. Conventionally, it is represented by slashes i.e. /b/, /o/, /j/ etc.

Comparison between English and Punjabi Phonology

Ellis, 2006 describes that in the matter of L2 learning, the prior linguistic codes can be an important factor. He further explains the Behaviorist view that, in the learning process of new language (L2) habits, the old language (L1) inevitably interferes in the learning process. The similarities in language structures lead to positive learning and it will facilitate the other language but if there is a vast difference between both languages, the interference occurs in the form of errors.

There are ample shreds of evidence of L1 influence on the structure and even every other aspect of L2 learners such as inter-language and intra-language. This influence affects morphological, lexical, discourse, phonetics, and phonological level. Fatemi et al., 2012 has performed phenomenal research to find out the difference in the consonant clusters present in the first and second language acquisition. They concluded that learners have problems mainly in pronunciation of speech sounds because of unfamiliar rules of phonology. In the same study by Fatemi (Lord 2008 is cited in Fatemi 2012) has quoted converse results stating facts that if a student.

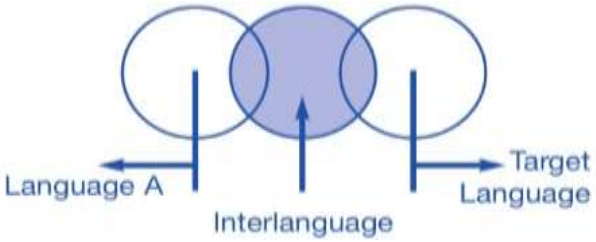
Second Language Acquisition

S. Krashen has defined Language Acquisition in his book "*Principles and Practice in Second Language Acquisition*" in the following words; there are many ways to interpret second language acquisition such as; implicit learning, natural learning and, informal learning. But to say it in non-technical term of language, language acquisition is just picking up language according to a person's interest (Krashen, 1982).

From many decades, the English language has a powerful status until today. The value of Second Language theories. This theory throws light on the successfully acquired second language enable a person to maintain his status to adopt another culture and linguistic group(Gardner & Lambert, 1972). In a case study on Arab learners of English, the researcher (Al-Saidat, 2010) elaborates the importance of English language through another phenomenon, especially English, which makes a person eligible in every field of life. In other words, it brings competence in performing many tasks in communication, business, technological learning, trade, and diplomacy.

Explaining Pronunciation errors

Selinker rejects the notion of errors regarding the matter of second language learning. He presents Interlanguage term to indicate these errors a natural process of acquiring a new set of language system.



Interlanguage diagram by (Han & Selinker, 2005)

He considers this phenomenon positively and shows this process in the following figure (Han & Selinker, 2005). Selinker's coined term 'interlanguage' is used for the transfer of knowledge not for errors of interference, which is used in a negative sense of the terms. But Corder has contradictory views about this problem. He states that these are errors which cause a hurdle in learning and understanding other language set rules (Corder, 1982).

Abbas has illustrated the significance of pronunciation and its positive effect on acquiring the second language, and due to this aspect of knowledge, a learner can get effective communication skills (Gilakjani & Ahmadi, 2011). They further added the factors influencing pronunciation learning. These factors have been classified as Exposure, Motivation, Attitude, Stress Intonation, Rhythm, Accent, Instruction, Age, Personality and Mother tongue Influence.

(Lekova, 2010) has stated in his study that the L1 can interfere in another language at many levels; this level can be lexical, morphological, syntactic and phonetic level. The most commonly occurred errors are in pronouncing open and closed vowels, and short and long vowels.

Transfer of First Language

Mother tongue interference has always been critical to second language acquisition. Native language and mother tongue are often used synonymously and interchangeably. According to Merriam Webster dictionary, the native language is the language of a person which he learns at his birthplace. Hence, it has a powerful influence on any other language. Behaviorists considered transfer as a form of learning habit. The focus of Mentalists is on creativity in the language learning process and lastly, the Cognitive Activists investigated and emphasized factors which help in language learning (Lu, 2010).Langfeng Lu further stated in his study that the importance of the role of transfer is acknowledged much later in 1990. The Modernists view of first language influence is stated by (Sinha, Banerjee, Sinha, & Shastri, 2009) saying that a universal system is applied in learning both languages acquisition, native and second language. If there is any dissimilarity between their terms of processing then, it creates interference.

Many researchers have investigated this interference phenomenon from their own specific problem or their own language perspectives. (Bhela, 1999) suggests interference as a helping hand in learning the second language.

Contradictory to the reference of interference as a helping tool (Brogan & Son, 2015) proposes second language theory in the light of negative transfer. For this purpose, recordings and semi-spontaneous speech data were collected from 72 university-level students. The errors were analyzed on the basis of lexical structure specifically noun-adjective agreement. This study is limited to look at the negative transfer of English into Spanish. That's why it could not claim the transfer of any other foreign language. A similar study was conducted with the native speakers of Arabic facing number of problems in acquiring a foreign language, especially the use of English articles. Thyab, 2016 stated the reason for producing errors is the concept of definite and indefinite articles encoded differently in their native language

Above studies agree with Dulay & Burt, 1974 that when a child feels difficult to learn the second language, he automatically resort to taking help from his native language or mother tongue. In the light of this statement, it would not be wrong to say that interference of L1is a natural phenomenon.

Methodology

This work has explored phonological errors of secondary school students. And, these errors involved some particular sound features of both languages particularly native language. To find out phonological features "Distinctive feature theory" presented by Russian linguist Roman Jacobson is theorized. According to Jacobson, all speech sounds are marked by binary opposition, hence they can be quantified or described. In this way, it assisted in presenting synchronized data. This study is based on qualitative design. Errors found out from phonological aspects of native language (Punjabi) in the form of speech sounds. These phonemes explored through acoustic analysis of speech data. Acoustic analysis is used to test the vibrations and noise of Punjabi language and differentiate its intensity or laxity.

For this purpose, data is collected from the population of Sheikhupura Urban unit schools. Ten high schools were selected both male and female sections. The reason behind selecting this population was the importance of the time period because secondary level education is considered as a new start of higher education that's why it is supposed that students have enough knowledge of second language to keep pace with the higher educational demands.

At first, the focus group discussions were conducted among 6-8 students from each class. They were given an easy topic in English to discuss for about 30 -40 minutes in a pre-arranged quiet room or lab to avoid noise or any kind of disruption in the audio recordings. Mobile audio software was also used for sound recording and data of 20 recordings (two from each school) is estimated to be

collected. Second activity was paragraph reading in second language (English). Collected phonological errors measured through software called PRAAT made by Paul Boersma and David Weenik in the University of Amsterdam. The data of audio recordings (focus group discussions) and paragraph reading recordings were analyzed to infer the authentic results.

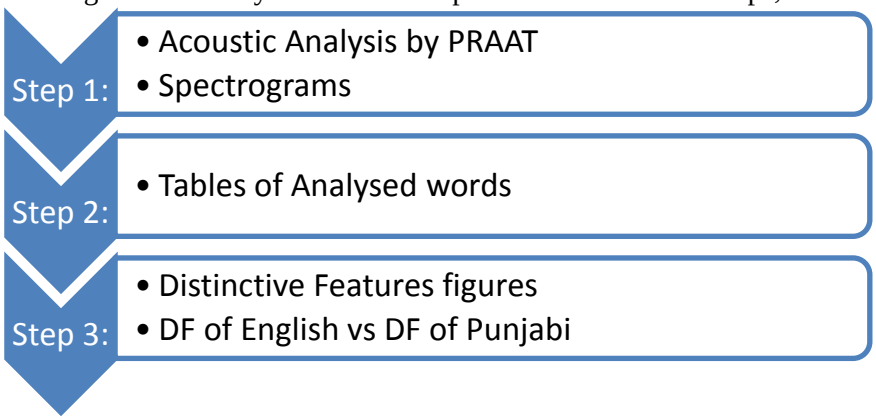
After collection of reliable data and application of acoustic analysis through PRAAT software, the recorded data measured the phonemic properties of Punjabi Language with English learning of students. The Spectrogram invented by two researchers (Ladefoged & Johnson, 2014) emphasized the computer-aided analysis of speech sounds. He exclaimed that spectrogram is a window showing off the frequency of sound content. And, Spectrogram is based on the analysis of presenting time and frequency on its axis (Cohen, 1995). The time is presented on the horizontal scale and frequency is shown on a vertical scale. The amplitude is shown by the grey-scale sheet. The dark area on spectrogram shows the high and intense signals and low signals are showcased by the grey-scale and least black color. Conventionally, strength is defined by acute black color and white indicate the least signal strength.

Spectrograms acted as helping hand to showcase our data into clear distinct images showed different features of consonants vividly and authentically.

Data Analysis

The data is collected in the form of spectrograms. Errors are shown and highlighted in spectrograms enhancing the interference level of Punjabi phonemes. The yellow line is indicating the intensity of a phoneme and the blue line with a highlighted dot are exposing pitch variation of Punjabi sounds. These indicators are very significant in their usage because the tonal nature of Punjabi language makes it so variant that it enters into every other language learned by a native speaker of Punjabi(Bowden, 2012). Secondly, showing errors and tone at the same time is very interesting to analyze and data interpretation. On the other hand, the interference errors are cleared in the form of a deviated transcription of English words given under each image where needed. Because the researcher has not only concentrated on consonantal errors but the other detected errors are also pointed out with the same technique. Each table, figure, and image of the spectrogram is showing negative transferred phenomenon. Each Punjabi phoneme is typed in bold format to indicate the error. Spectrograms are also categorized according to the type of errors i.e. segmental errors and supra-segmental errors. Three images are given to highlight the variety. Then there are tables showing data of those words with the same type of error. Lastly, the distinctive features of every interfered phoneme are exposed to verify our analysis making it more valid and reliable for after development.

This figure is showing the data analysis method and presentation has three steps;



Segmental Errors

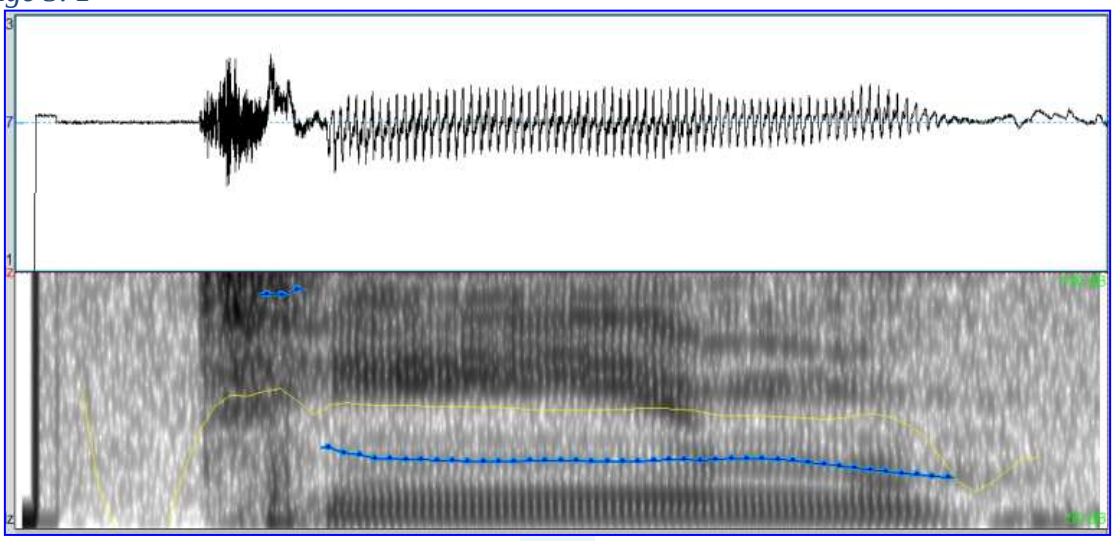
The speakers of NL Punjabi have faced many problems in the acquisition of new phonological rules of L2. Their errors are categorized into segmental errors showing consonants, vowels and diphthongs alterations. Only those errors are focused which are caused by NLT.

Supra segmental Errors

Punjabi tone is also strongly observed in the form of errors. This is also highlighted in the spectrograms. Supra segmental errors are added in the segmental analysis of consonants and vowels because it was not the concentration of the project. But these are of great importance that's why touched briefly side by side in every tables and discussion. Pitch contour and intensity interference is a very prominent characteristic of Punjabi.

Assimilation of Voiceless Aspirates

Image 5. 1



Thiːm

Table: 1

Substitution of dental fricatives/th/ in place of /ɵ/

Serial #	English Word	English Transcription	Punjabi Transcription
1	Theme	θiːm	**Th**iːm
2	Thought	θɔːt	**Th**ɔːt
3	Underneath	ʌndərˈniːθ	ʌndərˈniː**th**
4	Moth	mɔːθ	mɔː**th**
5	Broth	brɔːθ	brɔː**th**

DFs of /**θ**/ in English

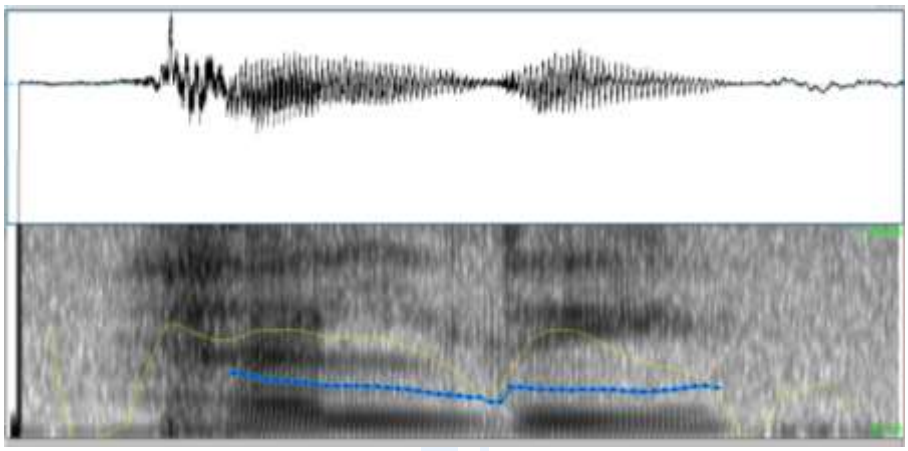
vocalic	−
consonantal	+
high	−
back	−
low	−
anterior	+
coronal	+
round	−
tense	+
voice	−
nasal	−
strident	−

DFs of /**th**/ in Punjabi

vocalic	−
consonantal	+
high	−
back	−
low	−
anterior	+
coronal	+
round	−
tense	+
voice	−
nasal	−
strident	−

In Punjabi Language usage, the participants has changed /**θ**/ sound into /th/ and that is due to influence and habits of first language set as in theme, moth and beneath etc.

Image 5. 2



hel **d**i

Table: 2
Replacement of /ð/ with /d/

Serial #	English Word	English Transcription	Punjabi Transcription
1	Although	ɔːlˈðoʊ	ɔːlˈ**d**oʊ
2	Rhythm	ˈrɪðəm	ˈrɪ**d**əm
3	These	ðiːz	**d**iːz
4	Breathe	briːð	briː **d**
5	Healthy	helθi	hel **d**i

DFs of /**ð**/ in English

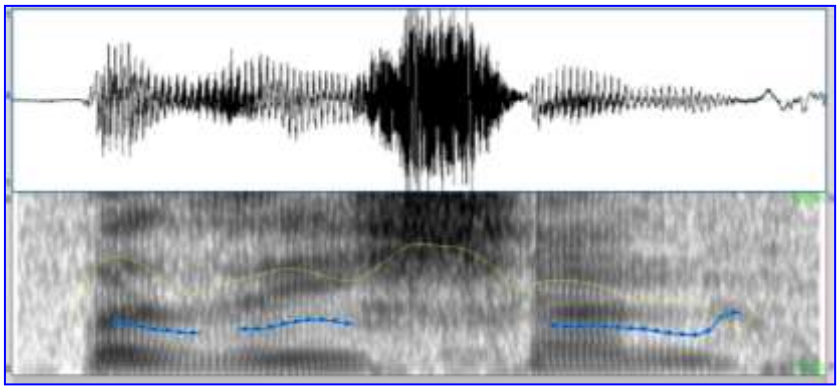
vocalic	−
consonantal	+
high	−
back	−
low	−
anterior	+
coronal	+
round	−
tense	+
voice	+
nasal	−
strident	−

DFs of /**d** / in Punjabi

vocalic	−
consonantal	+
high	−
back	−
low	−
anterior	+
coronal	+
round	−
tense	+
voice	+
nasal	−
strident	−

These both sounds /ɵ/ and /ð/ do not present in the phonemic inventory of Punjabi that's why the Pakistani speakers cannot perceive these sounds. So, they substitute them with available and resembled sounds/th/ and /d/ for convenience. The spectrogram image also showing the intensity of both sounds /th/ and /d/ and it is expressing that Punjabi tone has also interfered in their pronunciation.

Image 5. 3



pəzɪʃən

Table: 3
Substitution of un-aspirated /p/ (Word- initially)

Serial #	English Word	English Transcription	Punjabi Transcription
1	Pill	pɪl	**p**ɪl
2	Pronunciation	prənʌnsɪeɪʃən	**p**rənʌnsɪeɪʃən
3	Position	pəzɪʃən	**p**əzɪʃən
4	Patrol	pəˈtroʊl	**p**əˈtroʊl
5	Pistol	pɪstəl	**p**ɪstəl

DFs of /p/ (word-initially) in English

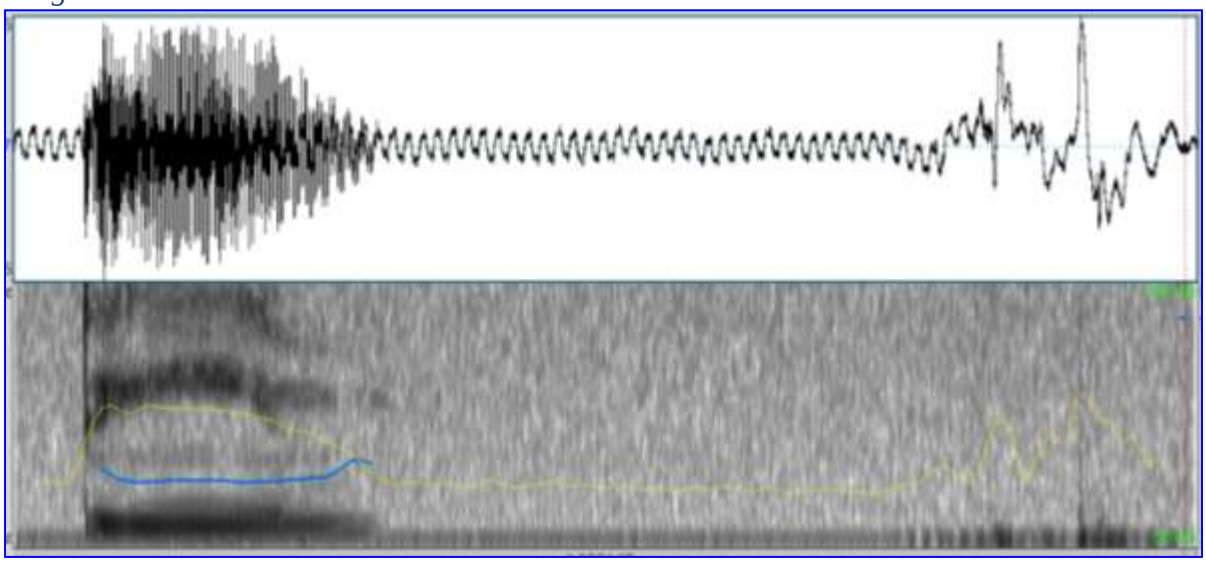
vocalic	–
consonantal	+
high	–
back	–
low	–
anterior	+
coronal	–
round	–
tense	+
voice	–
nasal	–
strident	–

DFs of /p/ (word-initially) in Punjabi

vocalic	–
consonantal	+
high	–
back	–
low	–
anterior	+
coronal	–
round	–
tense	+
voice	+
nasal	–
strident	–

The /p/ is un-aspirated in Punjabi as compared to aspirated /p/ in English.

Image 5. 4



TI:tʃə

Substitution of un-aspirated /t/ (Word- initially)

Serial #	English Word	English Transcription	Punjabi Transcription
1	Teacher	tiːtʃə	**t**iːtʃə
2	Traffic	træfɪk	**t**ræfɪk
3	Take	teɪk	**t**eɪk
4	Team	tɜːm	**t**ɜːm
5	Tension	tɛnʃən	**t**ɛnʃən

DFs of /t/ (word-initially) in English

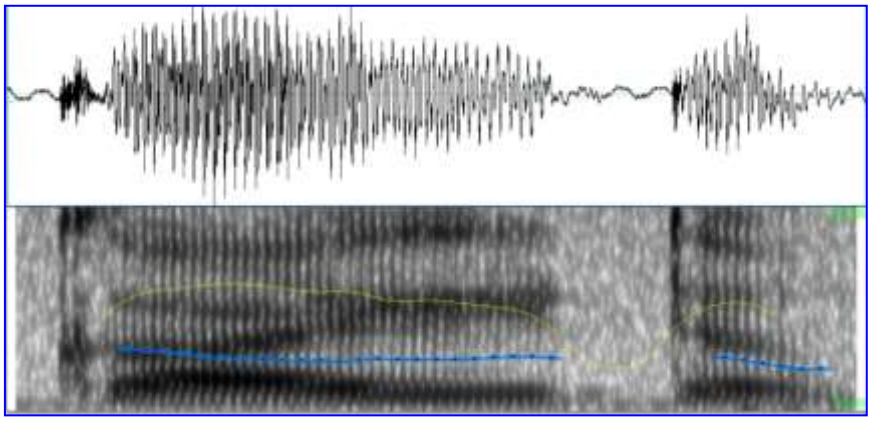
vocalic	–
consonantal	+
high	–
back	–
low	–
anterior	+
coronal	+
round	–
tense	–
voice	–
nasal	–
strident	–

DFs of /t/ (word-initially) in Punjabi

vocalic	–
consonantal	+
high	–
back	–
low	–
anterior	+
coronal	+
round	–
tense	–
voice	+
nasal	–
strident	–

/t/ is pronounced as un-aspirated due to Punjabi. Because in Punjabi language, there is no aspirated letter.

Image 5. 5



ki:wi

Substitution of un-aspirated /k/ (Word- initially)

Serial #	English Word	English Transcription	Punjabi Transcription
1	Kiwi	ˈki:wi	ˈ**ki**:wi
2	Kite	kaɪt	**k**aɪt
3	Kitten	kɪtn	**k**ɪtn
4	Kettle	ˈkɛtl	ˈ**k**ɛt
5	Kangaroo	ˌkæŋgəˈru:	ˌ**k**æŋgəˈru:

DFs of /k/ (word-initially) in English

vocalic	–
consonantal	+
high	+
back	+
low	–
anterior	–
coronal	–
round	–
tense	–
voice	–
nasal	–
strident	–

DFs of /k/ (word-initially) in Punjabi

vocalic	–
consonantal	+
high	+
back	+
low	–
anterior	–
coronal	–
round	–
tense	–
voice	+
nasal	–
strident	–

Like /p/ and /t/ the phoneme /k/ is also pronounced un-aspirated due to L1.

Image 5. 6 *IImage 5. 7*

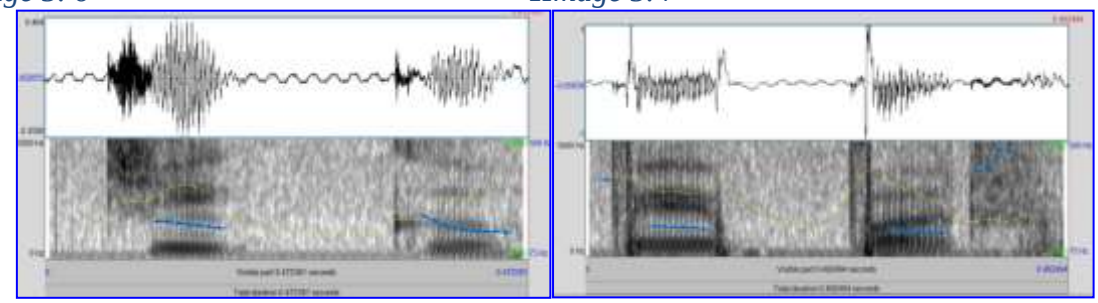
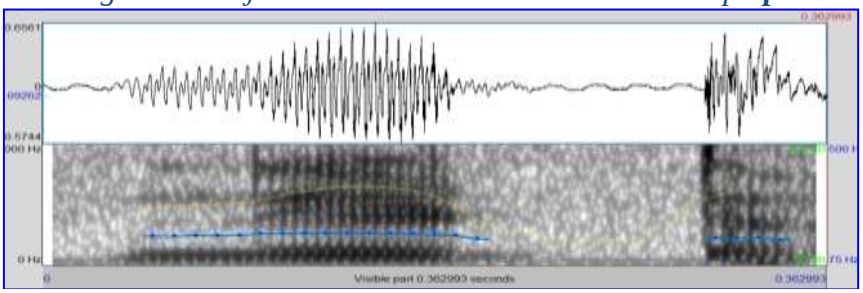


Image 5. 8 *ʧi**k*** *pɑɪ**p**ər*



nɪ**t**

Substitution of un-aspirated /p.t.k/ (Word-mid/final position)

Serial #	English Word	English Transcription	Punjabi Transcription
1	Skype	skaɪp	s**k**aɪp
2	Split	splɪt	s**pl**ɪ**t**
3	Piper	paɪpə	ˈpaɪ**p**ər
4	Chick	ʧɪk	ʧɪ**k**
5	Knit	nɪt	nɪ**t**

In the Punjabi language /p, t, and k/ are uttered un-aspirated because of their presence in inventory. There are separate phonemes for aspirated utterance in Punjabi as /kh/, /th/, /ph/ and that's why students have spoken these as simple phonemes as are available in their brain. Feature table also represented that there are only one difference between aspiration and un-aspiration sounds. The pitch in the spectral image is the evidence of the voiced quality of these three phonemes. All are voiced in initial, middle and final position. So, placement did not make any difference in the features.

Addition

Image 5. 9

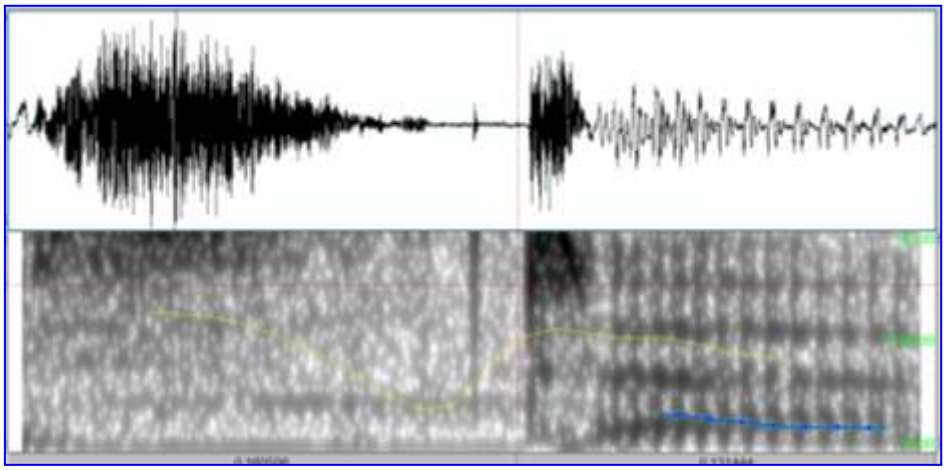


Table: 5

Addition of liquid /r/ in open syllable

Serial #	English Word	English Transcription	Punjabi Transcription
1	Character	ˈkærɪktə	ˈkærɪktə**r**
2	Master	ˈmɑːstə	ˈmɑːstə**r**

3	Teacher	ˈtiːʧə	ˈtiːʧ**ər**
4	Marker	ˈmɑːkə	ˈmɑːk**ər**
5	Tractor	ˈtræktə	ˈtræktə**r**

DFs /r/ in open syllable in English

vocalic	–
consonanta	–
high	–
back	–
low	–
anterior	–
coronal	–
round	–
tense	–
voice	–
nasal	–
strident	–

DFs /r/ in open syllable in Punjabi

vocalic	+
consonanta	+
high	_
back	_
low	_
anterior	_
coronal	+
round	_
tense	+
voice	+
nasal	_
strident	_

At final place /r/ is not pronounced in English but students of Punjabi native speakers pronounced according to spellings. They pronounced /r/ with its complete features.

Image 5. 10

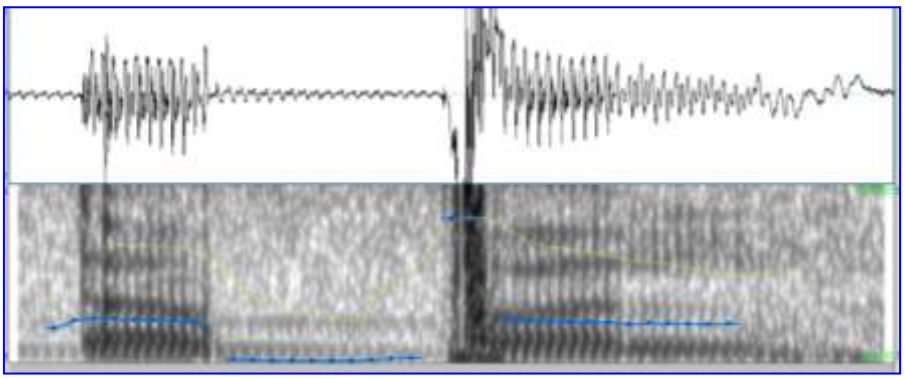


Table: 7

The voiced plosives /b/

Serial #	English Word	English Transcription	Punjabi Transcription
1	Bag	bæg	**b**æg
2	Blood	blʌd	**b**lʌd
3	Double	ˈdʌbəl	ˈdʌ**b**əl
4	Bubble	ˈbʌbl	ˈ**b**ʌ**b**l
5	Bulb	ˈ bʌlb	bʌl**b**

DFs of/b/ in English

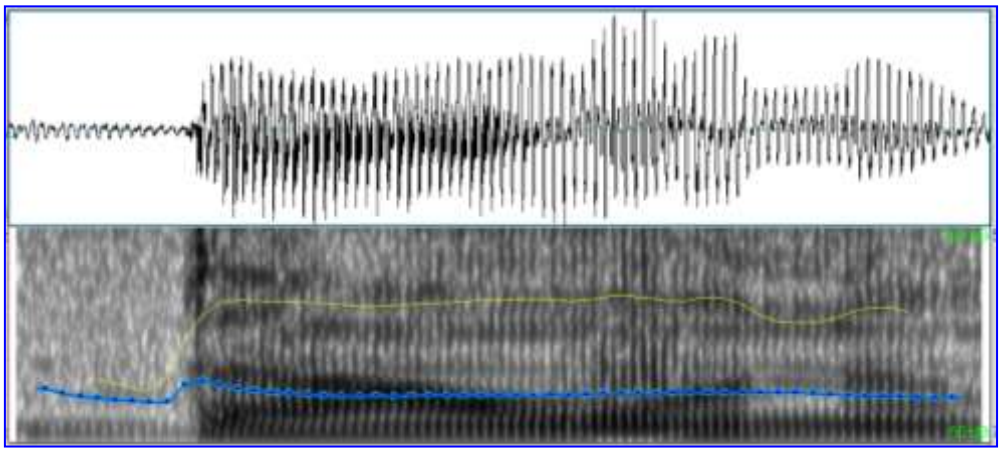
vocalic	_
consonant	+
high	_
back	_
low	_
anterior	+
coronal	_
round	_
tense	+
voice	_
continuent	_
nasal	_
strident	_

DFs of/b/ in Punjabi

vocalic	_
consonant	+
high	+
back	_
low	_
anterior	+
coronal	_
round	+
tense	+
voice	_
continuent	_
nasal	+
strident	+

The featuristic quality of /b/is observed as voiced and bilabial as in the second language. But its features as strident, high and tenseness came from Punjabi.

Image 5. 11



daʊn

The voiced plosives /d/

Serial #	English Word	English Transcription	Punjabi Transcription
1	Down	daʊn	**d**aʊn
2	Blood	blʌd	blʌ**d**
3	Death	deθ	**D**eθ
4	Powder	paʊdə	paʊ**d**ər
5	Peddle	pɛdl	pɛ**d**l

DFs of /d/ in English

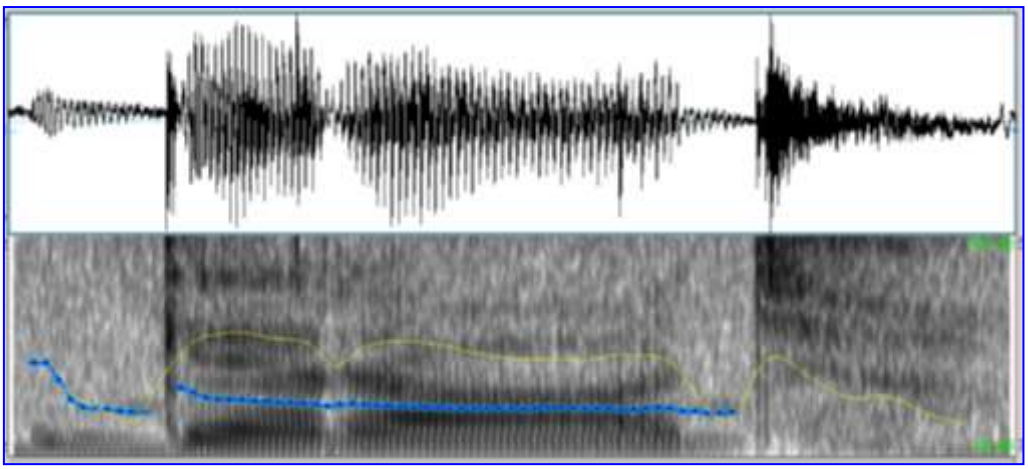
vocalic	−
consonantal	+
high	−
back	−
low	−
anterior	+
coronal	+
round	−
tense	+
voice	+
nasal	−
strident	−

DFs of /dh/ in Punjabi

vocalic	_
consonant	+
high	+
back	_
low	_
anterior	+
coronal	
round	_
tense	+
voice	+
continuent	_
nasal	_
strident	+

/d/ is uttered as same in English language but tone of Punjabi makes it high and intense. And some time sound as retroflex high in pitch variation.

Image 5. 12



The voiced plosives /g/

Serial #	English Word	English Transcription	Punjabi Transcription
1	Game	geɪm	**g**eɪm
2	Mug	mʌg	mʌ**g**
3	Garage	ˈgærɑːʒ	ˈ**g**ærɑːʒ
4	Badge	bædʒ	bæ**dʒ**
5	Figure	ˈfɪgə	ˈfɪ**g**ər

Dfs of /g/ in English

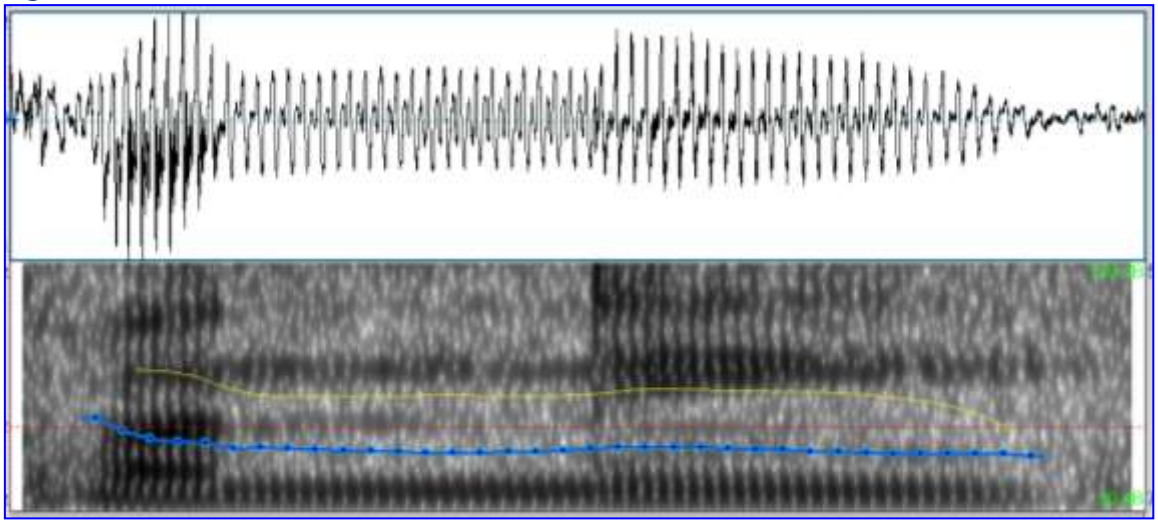
vocalic	–
consonantal	+
high	–
back	–
low	–
anterior	+
coronal	+
round	–
tense	+
voice	+
nasal	–
strident	+

Dfs of /g/ in punjabi

vocalic	–
consonantal	+
high	–
back	+
low	–
anterior	+
coronal	+
round	–
tense	+
voice	+
nasal	–
strident	+

Supra segmental Error (Consonant)

Image 5. 13



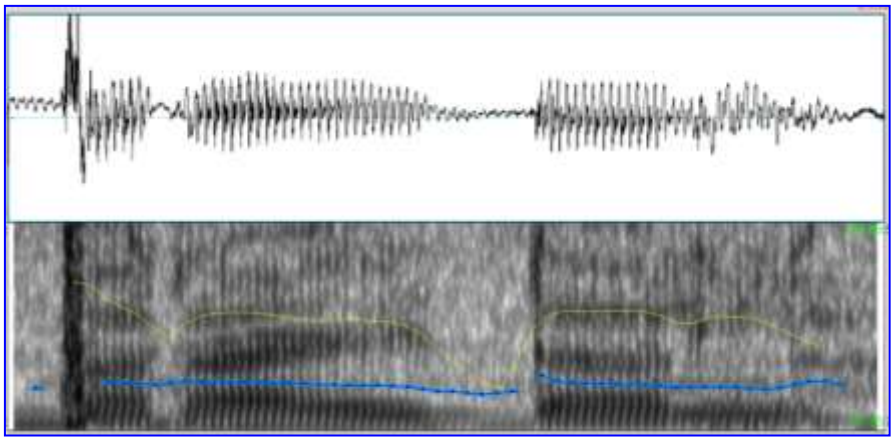
hɔː**l**

The intensity of double consonant sounds

Serial #	English Word	English Transcription	Punjabi Transcription
1	Hall	hɔːl	hɔː**l**
2	Funny	ˈfʌni	ˈfʌni
3	Accident	ˈæksɪdənt	æ**s**ɪdənt
4	Appear	əˈpɪə	əˈpɪə**r**
5	Current	ˈkʌrənt	ˈkʌ**r**ənt

The doubling of consonants has made a geminate. Sound is a little prolonged and stressed to show that there are digraphs. This quality has come from Perso-Arabic script in which a symbol is used to show stress, and the stressed syllable is considered as doubling of characters or sounds.

Image 5. 14



braɪdl

Table: 9

The intensity of liquids /l/ at the final position

Serial #	English Word	English Transcription	Punjabi Transcription
1	Bridal	braɪdl	braɪdl
2	Role	rəʊl	rəʊl
3	Normal	ˈnɔːməl	ˈnɔːməl
4	Serial	ˈsɪərɪəl	ˈsɪərɪəl
5	Struggle	strʌgl	strʌgl

DFs of /l/ in English

vocalic	+
consonant	+
high	_
back	_
low	_
anterior	+
coronal	+
round	_
tense	+
voice	+
continuent	+
nasal	_
strident	_

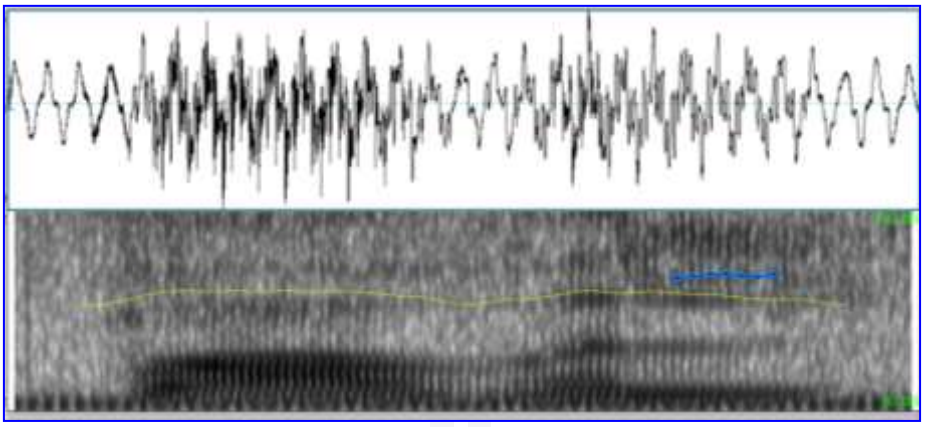
DFs of /l/ in Punjabi

vocalic	+
consonant	+
high	+
back	_
low	_
anterior	+
coronal	+
round	_
tense	+
voice	+
continuent	+
nasal	_
strident	_

/l/ is not velar sound at some places but due to its alveolar position in inventory, it works as a retroflex phoneme. It has no other related allophone in the native Punjabi language so it is pronounced as dental sound in middle place and retroflex sound at the final position.

Neutralization of sound

Image 5. 15



ʃavər

Table: 10
The Non-distinctive sounds in Punjabi /w/ and /v/

Serial #	English Word	English Transcription	Punjabi Transcription
1	Towel	ˈtaʊəl	ˈta**v**əl
2	Shower	ˈʃaʊər	ˈʃa**v**ər
3	Wood	wʊd	**v**ʊd
4	Switch	swɪʧ	s**v**ɪʧ
5	Jewelry	dʒuːəlri	dʒuː**v**əlri

DFs of /w/ in English

vocalic	−
consonant	−
high	+
back	+
low	−
anterior	−
coronal	−
round	+
tense	−
voice	−
continuent	+
nasal	−
strident	−

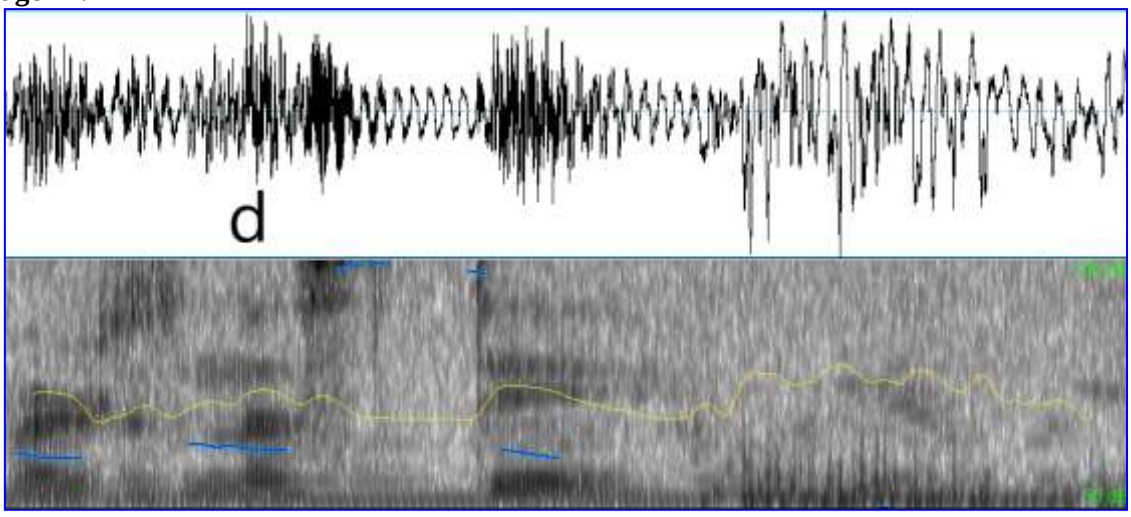
DFs of /v/ in Punjabi

vocalic	−
consonant	+
high	−
back	−
low	−
anterior	+
coronal	−
round	−
tense	−
voice	+
continuent	+
nasal	−
strident	+

Due to the absence of particular /w/ sound in Punjabi, most of the students pronounced it as semivowel sound /v/ in every place. It is voiced instead of unvoiced /w/ and showed burst in the spectral image.

Insertion

Image 17:



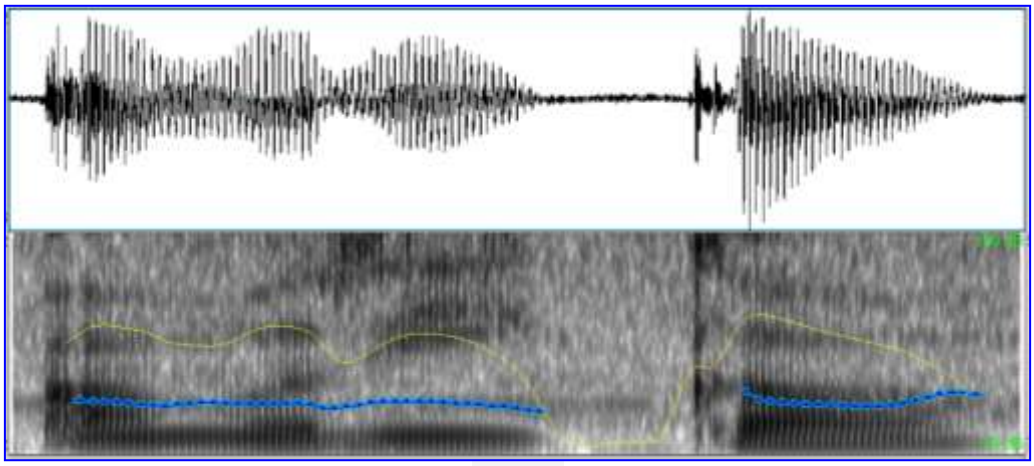
wɛ**d**nzdeɪ

Table: 11
Insertion of sound omitted in English

Serial #	English Word	English Transcription	Punjabi Transcription
1	harmony	hɑːməni	hɑː**r**məni
2	Proficient	prəˈfɪʃənt	prəˈfɪ**ʃi**ənt
3	Adjust	əˈʤʌst	ə**d**ˈʤʌst
4	Government	ˈgʌvnmənt	ˈgʌv**r**nmənt
5	Wednesday	ˈwɛnzdeɪ	ˈwɛ**d**nzdeɪ

Punjabi speakers have pronounced the words of English according to their spelling influence rather than memorizing the phonological rules.

Image 18:



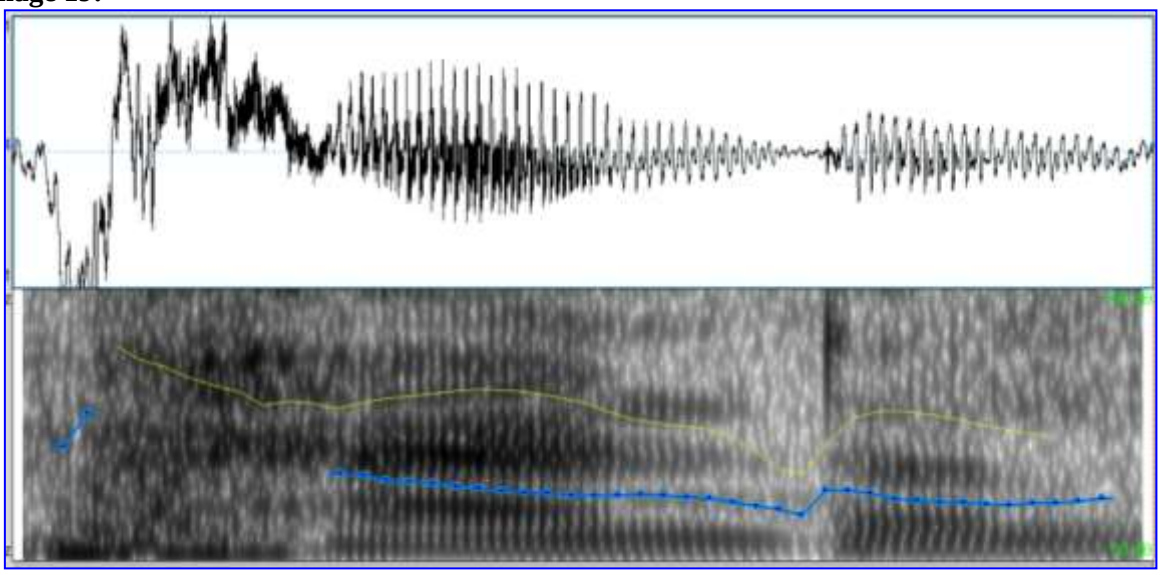
ɒbdʒɪkt

Table: 12
Stress shift Errors

Serial #	English Word	English Transcription	Punjabi Transcription
1	America	əˈmɛrɪkə	əˈm**ɛrɪkə**
2	Object	ɒbdʒɪkt	**ɒb**dʒɪkt
3	Photographer	fəˈtɒgrəfə	**fəˈtɒ**grəfər
4	Balcony	bælkəni	bæl**kəni**
5	Development	dɪˈvɛləpmənt	**dɪ**ˈvɛləpmənt

Students did not recognized the stress shift rules; primary, secondary and others. They followed their own language rules in passing stress.

Image 19:



hændəl

Table: 13
/h/ is pronounced more forcefully.

Serial #	English Word	English Transcription	Punjabi Transcription
1	Handle	hændəl	**h**ændəl
2	Youth	juːθ	juː**θə**
3	Hosting	həʊstɪŋ	**h**əʊstɪŋ
4	Hair	heər	**h**eər
5	Church	tʃɜːtʃ	tʃɜː**rətʃ**

Dfs of /h/ in English

vocalic	–
consonant	–
high	–
back	–
low	+
anterior	–
coronal	–
round	–
tense	–
voice	+
continuent	–
nasal	–
strident	–

DFs of /h/ in Punjabi

vocalic	–
consonant	+
high	–
back	+
low	–
anterior	+
coronal	+
round	–
tense	+
voice	+
continuent	–
nasal	–
strident	+

/h/ is pronounced more forcefully in comparison with English /h/ as unvoiced aspirated sound. It is also lengthy in utterance as shown in spectrogram with intensity in pitch and burst.

Epenthesis Errors

Image 20:

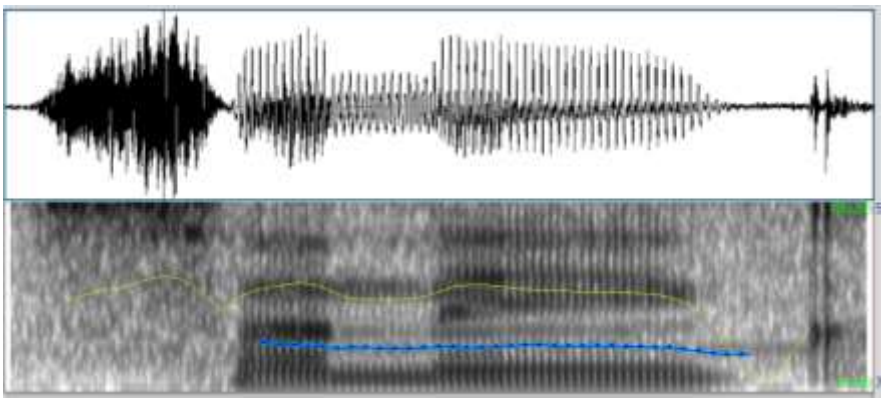


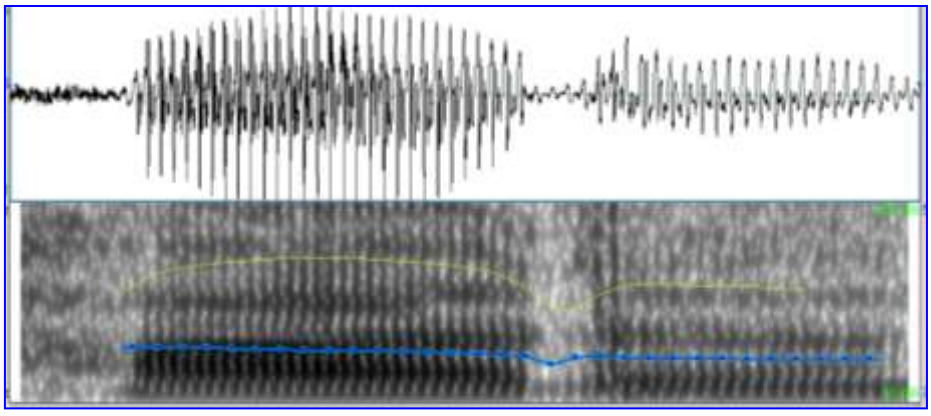
Table: 14

Epenthesis in Stop Alveolar Fricatives clusters /sp/, /st/, /sn/

Serial #	English Word	English Transcription	Punjabi Transcription
1	Still	stɪl	sətɪl
2	Snake	sneɪk	səneɪk
3	Skipping	ˈskɪpɪŋ	ˈsəkɪpɪŋ
4	Slime	slaɪm	səlaɪm
5	Sweeper	ˈswiːpə	ˈsəviːpər

The epenthetic vowel is inserted because their language does not have these clusters in word-initial positions and the speakers try to preserve the structures of their own language when speaking English.

Image 21:



fɪləm

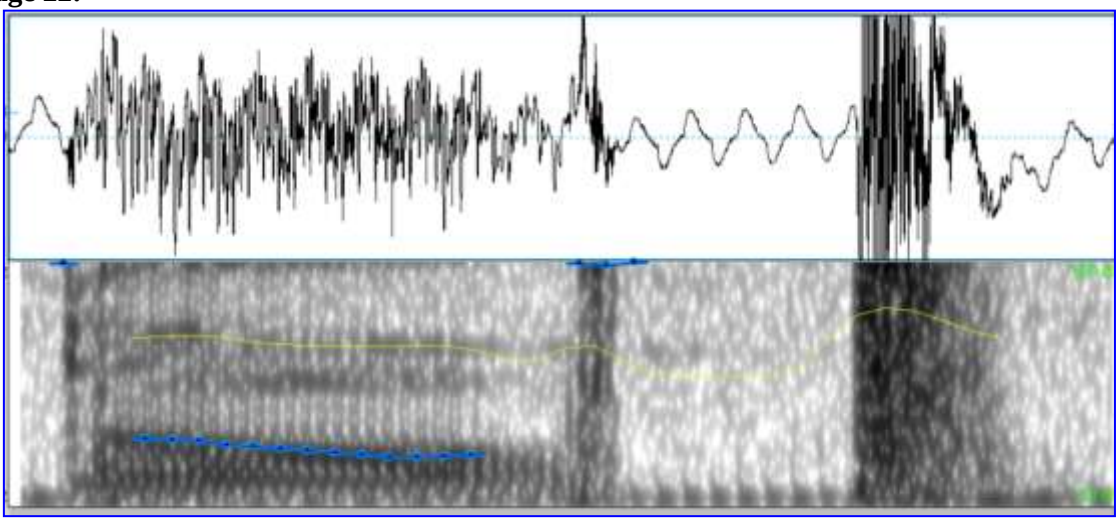
Table: 15
Epenthesis of schwa at the coda of consonant cluster

Serial #	English Word	English Transcription	Punjabi Transcription
1	Film	fɪlm	fɪləm
2	Double	ˈdʌbl	ˈdʌbəl
3	Shift	ʃɪft	ʃɪfət
4	Bulb	bʌlb	bʌləb
5	Ministry	ˈmɪnɪstri	ˈmɪnɪstəri

It is notable that consonantal clusters /sk/, /st/ and /sp/, Punjabi speakers used /ə/ as a little pause. This is also true for Hindi speakers so that Kachru (1969: 28) gives the following pronunciations of school, speak, and stall: /ɪsku:I/, /ɪspi:k/ and /ɪsta:l/.This is the epenthetic vowel which Punjabi speakers also insert. However, they insert /ə/ between the three word-initial consonants, e.g. /səku:I/, /səpi:k/ and /səta:I/. It is shown as a pause on the spectrogram.

Vowel substitution

Image 22:



Ho:rən

Table: 17
Substitution of /ɔ:/ with /a:/ or /o:/

Serial #	English Word	English Transcription	Punjabi Transcription
1	Torch	tɔ:ʧ	Ta:rəʧ
2	Horn	hɔ:n	Ho:rən
3	Lord	lɔ:d	Lo:rəd

DFs of/ ɔ:/ in English

vocalic	+
consonant	–
high	–
back	+
low	+
anterior	–
coronal	–
round	+
tense	–

DFs of /o:/ in Punjabi

vocalic	+
consonant	–
high	–
back	+
low	–
anterior	–
coronal	–
round	+
tense	+

Image 23:

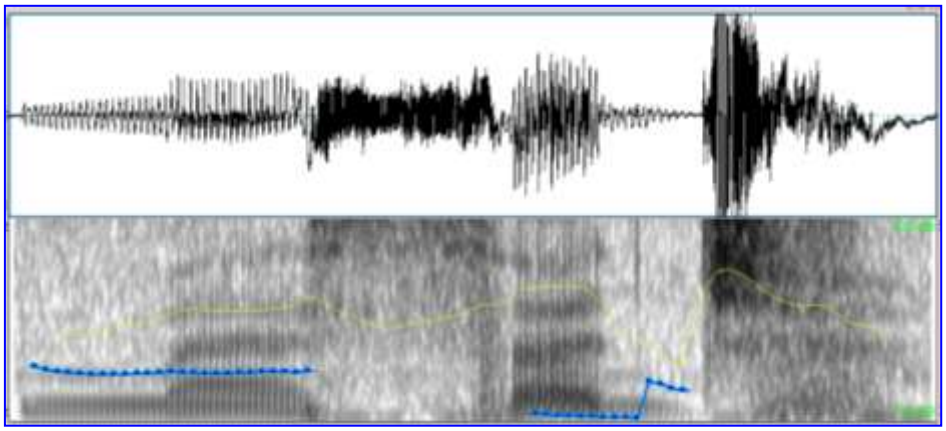


Table: 18

Substitution of /ɪ/ with /ə/

Serial #	English Word	English Transcription	Punjabi Transcription
1	Message	ˈmɛsɪʤ	ˈmɛsəʤ
2	Kitchen	ˈkɪʧɪn	ˈkɪʧɪən
3	Wiring	ˈwaɪərɪŋ	ˈwaɪərɪəŋ

DFs of /ɪ / in English

vocalic	+
consonant	–
high	+
back	–
low	–
anterior	–
coronal	–
round	–
tense	+

DFs of /ə / in Punjabi

vocalic	+
consonant	–
high	–
back	+
low	–
anterior	+
coronal	–
round	–
tense	–

Image 24:

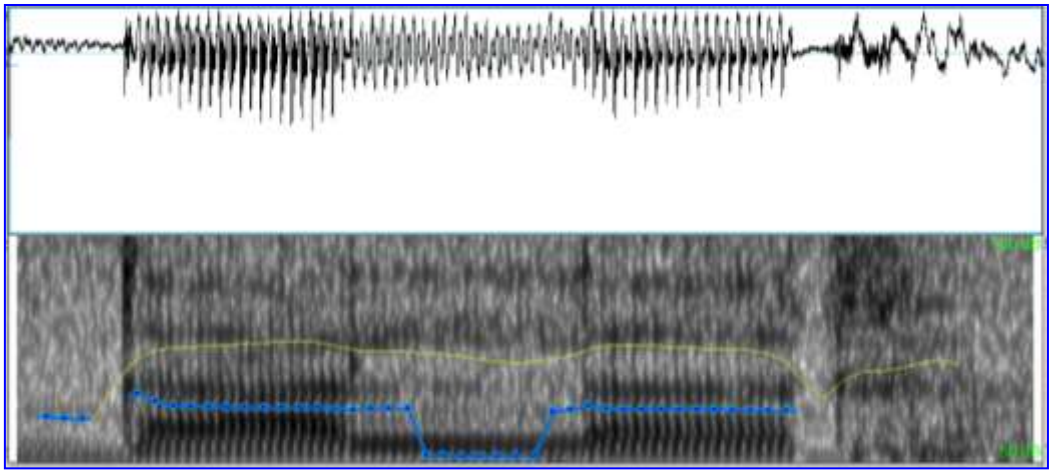


Table: 19

Substitution of back vowel /ɒ/ with /a:/

Serial #	English Word	English Transcription	Punjabi Transcription
1	College	ˈkɒlɪʤ	ˈk**a:**leʤ
2	Doctor	ˈdɒktə	D**a:**ktər
3	Dollar	ˈdɒlə	ˈd**a:l**ər

DFs of /**ɒ**/ in English

vocalic	+
consonant	–
high	–
back	+
low	–
anterior	–
coronal	–
round	+
tense	–

DFs of /a:/in Punjabi

vocalic	+
consonant	–
high	–
back	+
low	–
anterior	–
coronal	–
round	+
tense	+

These types of words are mostly adopted words in Punjabi as loan words. That is the reason the students pronounced them as in spoken by any Punjabi speaker. So they replaced /a: / instead of /ɒ/. It is clear from long vowel sound in the spectrogram of /D**a:**ktər/.

Image 25:

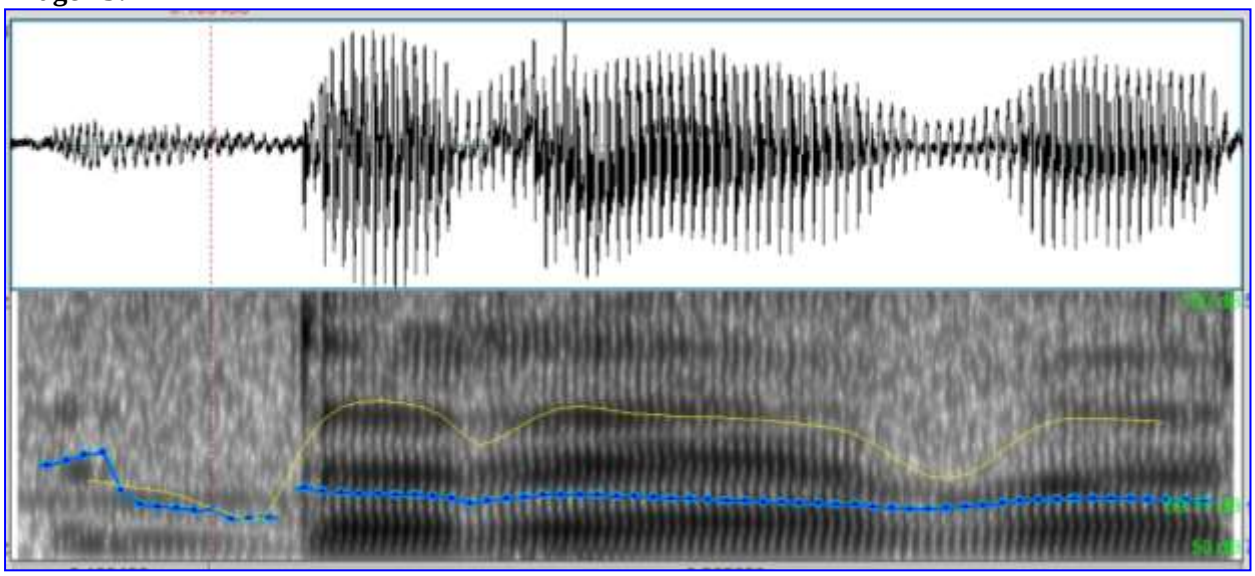


Table: 20

Substitution of /aɪ/ with /æ/

Serial #	English Word	English Transcription	Punjabi Transcription
1	Spider	ˈspaɪdə	ˈspæd**ər**
2	Driver	ˈdraɪvə	ˈdræv**ər**
3	Liner	ˈlaɪnə	ˈlænə **r**

DFs of /aɪ/ in English

vocalic	+
consonant	–
high	–
back	+
low	+
anterior	+
coronal	–
round	–
tense	+

DFs of /**æ** /in Punjabi

vocalic	+
consonant	–
high	–
back	+
low	+
anterior	–
coronal	–
round	–
tense	–

/aɪ/ is replaced by /**æ/.**

Image 26:

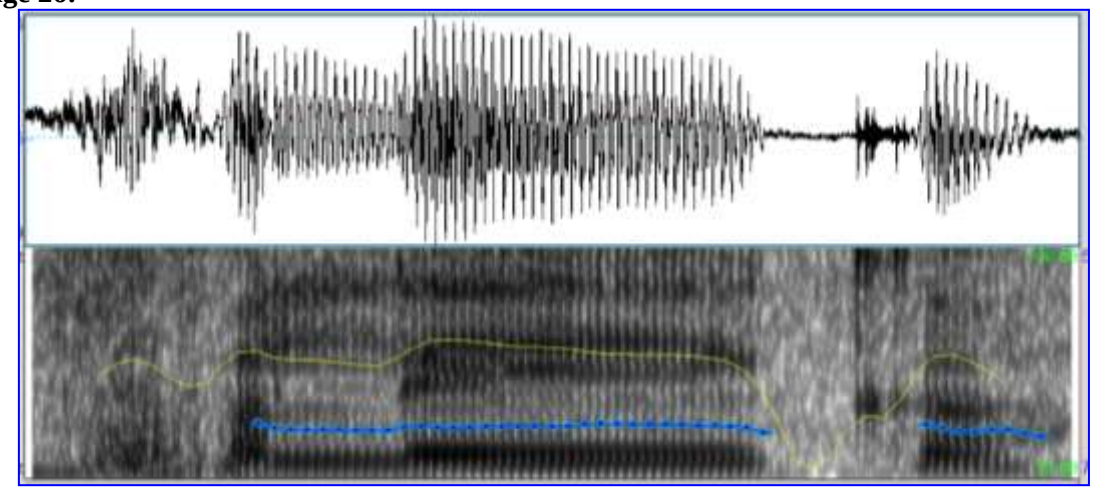


Table: 21

Substitution of /eɪ/ with /e: /

Serial #	English Word	English Transcription	Punjabi Transcription
1	Flake	fleɪk	Fle:k
2	Partake	pɑːˈteɪk	pɑːrˈteːk
3	Hate	heɪt	Heːɪt

DFs of /eɪ/ in English

vocalic	+
consonant	–
high	+
back	–
low	–
anterior	–
coronal	–
round	–
tense	+

DFs of /e:/ in Punjabi

vocalic	+
consonant	–
high	+
back	+
low	–
anterior	–
coronal	–
round	–
tense	+

Image 27:

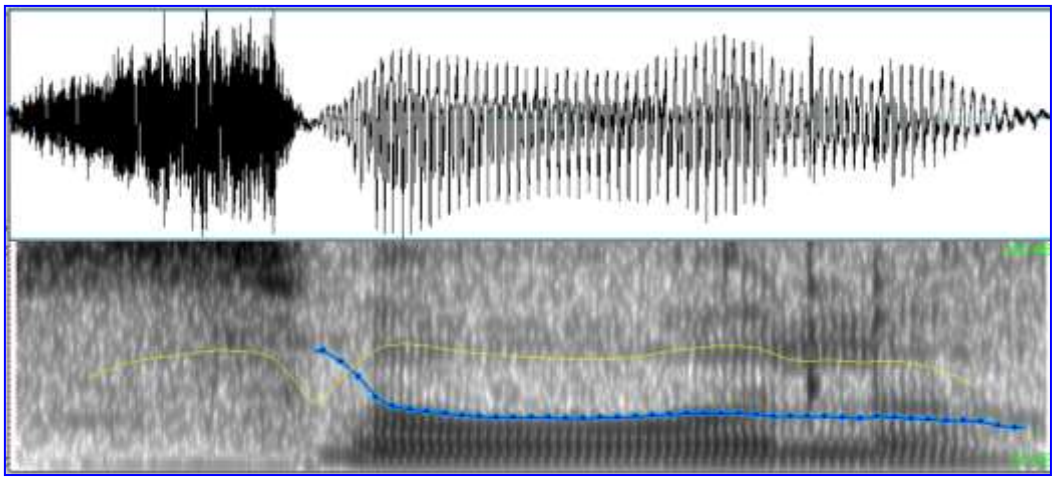


Table: 22

Substitution of closing diphthong /əʊ/ with /o:/

Serial #	English Word	English Transcription	Punjabi Transcription
1	Sole	səʊl	So:lə
2	Sofa	ˈsəʊfə	ˈso:fə
3	Total	ˈtəʊtl	ˈto:təl

DFs of /əʊ/ in English

vocalic	+
consonant	_
high	_
back	+
low	_
anterior	_
coronal	_
round	+
tense	+

DFs of /o:/ in Punjabi

vocalic	+
consonant	_
high	_
back	+
low	_
anterior	_
coronal	_
round	+
tense	+

/əʊ/ is not available in Punjabi utterance that's why replaced by /o:/ which is a monophthongs.

Image 28:

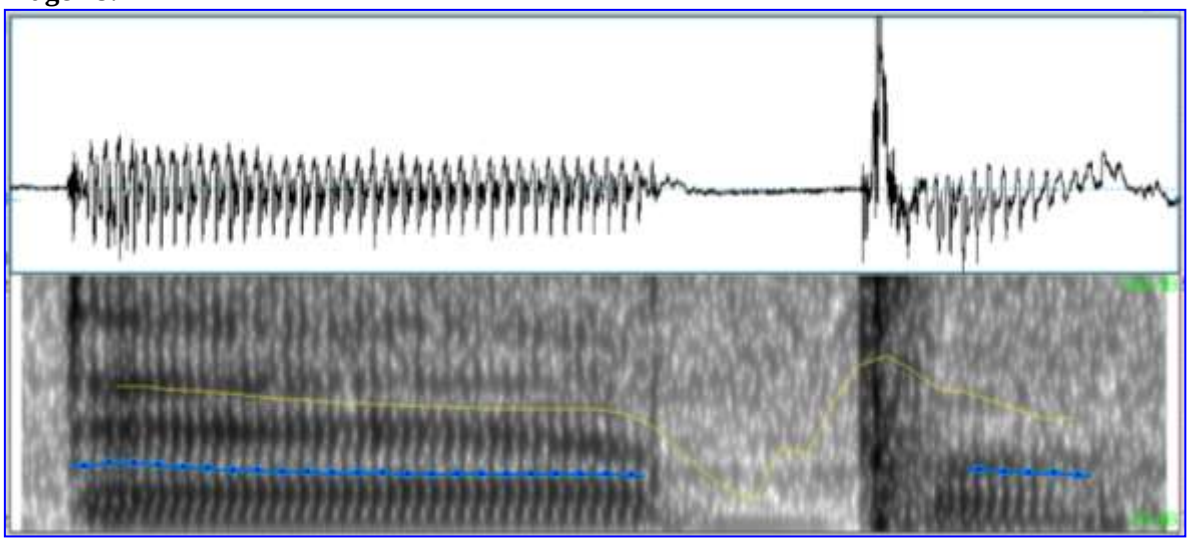


Table: 23

Monophthongs in place of diphthongs

Substitution of /aɪə/ with /æ/

Serial #	English Word	English Transcription	Punjabi Transcription
1	Tire	ˈtaɪə	tær
2	Fire	ˈfaɪə	**fæ**ər
3	Type	taɪp	tæp

Feature of diphthong / aɪə / in English

vocalic	+
consonant	_
high	+
back	+
low	+
anterior	+
coronal	_
round	_
tense	+

Features of /**æ** / in Punjabi

vocalic	+
consonant	_
high	_
back	+
low	+
anterior	_
coronal	_
round	_
tense	_

The triphthongs /aɪə/ is replaced its nearest single sound in Punjabi. Although this sound is available in the Punjabi inventory but, the students has changed for the sake of facilitation to pronounce.

Discussion

From the obtained data on the errors resulted from interference, it showed that in the case of interference of Punjabi language, there is no aspiration for sounds /p/, /t/ and /k/ in a certain position. In contrast, English recognizes aspiration for sounds /p/, /t/ and /k/ if the sounds appear at the beginning of a word or syllable before stressed vowels as explained by Fromkin : "Aspirate voiceless stops at the beginning of a word or syllable before stressed vowels" (1978, p. 116). As a result, English learners whose Punjabi language background, tend to not aspirate sounds /p/, /t/ and /k/ at the positions explained by Fromkin.

Punjabi is related to the system in which inventory allows sounds /b/, /p/, /d/, /t/, /g/ and /k/ to appear at all positions (initial, middle, and final) as un-aspirated. In the English language, these have different features in different positions. Not all vowels are affected by interference. To be specific, all vowels /ɔ, ɔ:, u:/ are not replaced. The interference only occurred on the vowel /u:/ in which /u:/ was replaced with /o:/. Other is changed in some way or the other due to stress, pitch, and intensity of Punjabi language and its prosodic elements.

Conclusion

It is a well-known fact that the outlook of a person is seen through his spoken skills. Due to these skills, the expertise of a new language learner is judged. And, pronunciation is the tool to understand that communication process. In the matter of pronunciation in the native language, the other person may forebear the errors of the first person in his speech, accent, and rising-falling tones but when it is the situation in second language learning, this observation becomes more evident. Errors in pronunciation are the windows to see the level of language acquisition. The circumstances of this discussed issues in learning a new language set up doubles when it involves the students from Public sectors. It results in their absence in their presentation in educational events and classroom discussions in L2. That's why this study highlights all the possible pronunciation errors occurred during the speech of the Government Schools students and making them aware of these problems especially the teachers of SL.

There are many studies conducted using the Acoustic analysis with Punjabi and English language but, by missing one thing or the other the results in the form of consonants in detail. It is quite right that their comparisons at orthographical and phonological level inferences are significant but there is something missing in them in the use of specific phonemic inventory of Shahpuri Punjabi dialect and its phonological interference effect regarding consonantal phonemes. The context of Sheikhupura is also new to discover regarding this debate because there is a clear difference in the orthographical system of every dialect of Punjabi.

On the other side, the Acoustic Analysis tool is not complete in itself to indicate the errors. It just showcases the word or phoneme some qualities and characteristics to differentiate it from the other transferred language. The investigated errors in this study also appear with a reason of occurrence. Firstly, it was supposed to find out the pronunciation errors due to negative transfer of Punjabi. This phenomenal issue was already our problem statement. But, the other most important factor as a hurdle is recognized through observation during collecting data is the fossilization of teacher's pronunciation errors. In other words, students not only make errors due to NLT but teachers also transferred their errors to students communication set. These speakers are least intelligible to foreigners and their pronunciation is guided almost entirely by orthography except in words of common use. So this work is definitely going to help them in recognizing their errors and choose a correct repair strategy for future purposes.

To conclude, it will be appropriated to say that in Pakistan, following these data sets of evidence the teachers or the instructors of ESL may get a structural model to diminish the errors in the pronunciation of the students. Especially the students from the Public Sectors Schools studying Matriculation is an important stage to make them aware of the English Language requirements and getting prepared for upcoming vistas of higher studies which are mainly in the English Language.

References

Akram, M., & Mahmood, A. (2007). *The status and teaching of English in Pakistan*. Journal of Language Studies, 7(2), 1–10.

Al-Saidat, E. M. (2010). *Phonological analysis of English pronunciation errors made by Jordanian university students*. Journal of Language Teaching and Research, 1(2), 1–8.

Bhela, B. (1999). *Native language interference in learning a second language*. International Education Journal, 1(1), 22–31.

Brogan, F., & Son, J. (2015). *Second language pronunciation teaching and learning*. TESOL Quarterly, 49(3), 1–15.

Cohen, A. D. (1995). *Second language learning and use strategies*. Modern Language Journal, 79(1), 1–14.

Corder, S. P. (1982). *Error analysis and interlanguage*. Oxford University Press.

Dulay, H., & Burt, M. (1974). *Errors and strategies in child second language acquisition*. TESOL Quarterly, 8(2), 129–136.

Ellis, R. (2006). *Current issues in the teaching of grammar: An SLA perspective*. TESOL Quarterly, 40(1), 83–107.

Fatemi, M. A., Sobhani, A., & Abolhassani, H. (2012). *Difficulties of English pronunciation among EFL learners*. International Journal of Linguistics, 4(1), 1–15.

Gardner, R. C., & Lambert, W. E. (1972). *Attitudes and motivation in second-language learning*. Newbury House.

Gilakjani, A. P., & Ahmadi, M. R. (2011). *Why is pronunciation so difficult to learn?*. English Language Teaching, 4(3), 74–83.

Han, Z., & Selinker, L. (2005). *Fossilization in second language acquisition*. Multilingual Matters.

Karamat, N. (2001). *A study of English language problems in Pakistan*. Pakistan Journal of Education, 18(1), 45–60.

Kenstowicz, M. (1994). *Phonology in generative grammar*. Blackwell.

Krashen, S. D. (1982). *Principles and practice in second language acquisition*. Pergamon.

Ladefoged, P., & Johnson, K. (2014). *A course in phonetics* (7th ed.). Cengage Learning.

Lekova, B. (2010). *Language interference and methods of correction*. Trakia Journal of Sciences, 8(3), 320–324.

Lu, X. (2010). *Automatic analysis of syntactic complexity in second language writing*. International Journal of Corpus Linguistics, 15(4), 474–496.

Sinha, A., Banerjee, N., Sinha, A., & Shastri, R. (2009). *Interference of first language in second language learning*. Journal of Language Teaching, 5(2), 15–23.

Tariq, A., Bilal, H. A., Sandhu, M. A., Iqbal, A., & Hayat, U. (2013). *Difficulties in learning English as a second language in Pakistan*. Journal of Education and Practice, 4(24), 1–10.

Thyab, R. A. (2016). *Mother tongue interference in learning English pronunciation*. International Journal of English Linguistics, 6(3), 1–10.

Trubetzkoy, N. S. (1969). *Principles of phonology*. University of California Press.

Zarka, M., & El-Said, M. (2013). *Pronunciation problems among EFL learners*. Journal of Linguistics Studies, 3(1), 1–12.