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Let's Start!

Phonological Variations in the Speech of Native Pashto Speakers: A PRAAT Assisted Study of English Short Vowels

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Abstract

Phonological variation is the trademark of linguistic diversities, illuminating the complicate intricacies between speech patterns and language contact. World Englishes in this regard validates the rich tapestry of those phonological variations which are moulded by collaboration of English with other vernaculars. Using World Englishes as Theoretical Framework, this study exposes variant English short vowels of Received Pronunciation (RP) in the speech of native speakers of Pashto (NSP). The study also attempts to describe variant RP short vowels in terms of places and manners of articulation. Through the utilization of Qualitative method, the study scrutinizes the pronunciation of soft and hard dialects of Pashto on PRAAT. Data for this study was generated in form of word list exhibiting phonemic environment at word initial, final and medial levels. The analysed data demonstrates spectrogram, formants, scripts, variant pronunciation, Received Pronunciation and duration simultaneously. The result reveals significant variations in the production of English vowels. The commonly variant phonemes are: /i/, /e/, /æ/, /ɒ/, /ə/. These vowels are pronounced differently which justifies the use of a unique variety of RP English practiced in the context of Khyber Pakhtunkhwa. The findings have also implications in comprehension of composite interplay between speech patterns and language contact. The present investigation is an attempt to describe variant phonemes and may inspire further exploration in socio-phonetic, prosodic, supra-segmental features, lexical and syntactic analysis for the comprehensive understanding of language variations and World Englishes.

Keywords: World Englishes, Phonological variations, Native Speakers of Pashto (NSP), Received Pronunciation (RP), Monophthongs, Acoustic, PRAAT, Spectrogram

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INTRODUCTION

English has become a global medium with local identities. Assisted by the enormous flexibility and size of language, the non-native users of English are carving out larger territories within their own frontiers (Wardugh and Fuller 2015). This results in nativized makeup of English with the idiosyncratic features of its users in non-native English context (Hassan 2014). English has been explored with reference to languages like Shona, Malaya, Chinese, Arabic, Polish, Punjabi, and Urdu (Lim (2010), Li (2016), Mesthrie and Bhatt (2008). Utulu (2014) Trudgill and Hannah (2017), Watt (2003), Yang, Robb, Gilbert & Lerman (2001)) at different linguistic levels. Phonological variations in English short vowels in the speech of native speakers of Pashto, particularly in the context of Khyber Pakhtunkhwa (KP), remain uninvestigated. It is assumed that Pashto speakers of KP have indigenized English vowels. They associate unique phonological features with the pronunciation of English words containing short vowels. Indigenization of English according to Rahman (2014) occurs whenever a language (English) is used by the speakers of another language and change in the form, function and use of English becomes unavoidable. Although English with reference to Yusufzai dialect has been investigated (Hallberg 1992, Baart 2001, Ijaz 2003, Steven 2003, Farashah 2010, Iqbal and Rahman 2016, Khan and Shahzad 2017), the investigation of English with its unique Pashtonized phonological features and distinctive position in KP with reference to the major dialects of Pashto has not been explored on experimental basis through acoustic phonetics. A PRAAT assisted study would significantly highlight variant English phonemes by Pashto speakers in the Pashtun context and would trigger research in supra-segmental domains as well. Phonological variations in English have been explored by researchers using PRAAT both at national and international levels (Rahman (2009), Khan and Shahzad (2017), Utulu (2014), Al-Badawi and Salim (2014), Baidar, Iqbal and Rahman (2016), Rahman and Hamid (2020), Bilal, Azher, Ishfaq and Mumtaz (2021), Boersma & Weenink (2022)) and this proves the validity and reliability of this tool.

There is a need to discover much more about how users of English become attuned to the phonetic properties of their native (Pashto) language (Foulkes *et al.* 2005) and the extent to which an individual is a propagator for the adaption and adoption of innovative variants of a language. English being the part of the linguistic scenario of Khyber Pakhtunkhwa and the academic language of Pakhtuns is now rapidly remaking and domesticating by them. Pakhtuns are becoming more and more relaxed about the way they use English with their own unique native accent. Despite its common use in academic and non-academic setting of Khyber Pakhtunkhwa, very little work has been done to explore English in Pashtun context with relation to the major dialects of Pashto. It is also necessary to have knowledge of the description of English short vowels in the context of KP. Due to this dearth of research in KP, this study aims at revealing the unique pronunciations of English short vowels by native Pashto speakers with the aim of identifying their articulators, manners, position, place of tongue and nature of spike for their scientific justification. Keeping in view, the study aims to investigate and describe the articulatory and acoustic features of English short vowels in the pronunciation pattern of the speakers of soft and hard dialects of Pashto so to identify commonly variant English short

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vowels. It becomes of great significance to make sure the stable status of English in Khyber Pakhtunkhwa Pakistan to help us stay connected with the world using English with its own unique features and to curb the cultural alienation that act as barrier between us and the English world full of opportunities. The world is in gradual change and so is language. English has taken new shape and its influence has never declined (Haque, 1982). We should accept variations from standards to develop new written and spoken conventions spontaneously. English has become one of our languages (Hasman, 2004). English in KP is gaining more and more significance and the situation is constantly evolving. It becomes of significant importance to explore the phonological variations to describe short vowels of English used in KP.

METHODOLOGY

Research design in this study is exploratory in nature and utilizes Qualitative approach towards data analysis. This exploratory design is used to seek a deeper insight to expose variant patterns in pronunciation. With the assistance of supervisor, a word list was developed as data for the present investigation. Words include target sound at initial, final and medial level to provide objective environment. The utilization of English in academic locations of Khyber Pakhtunkhwa directed the recruitment of participants from 5 public universities. University students according to Kadenge (2009) are presumed to have accomplished an acceptable level of English aptitude causing them ideal participants. Purposive sampling procedure was applied for the selection of required participants. 10 students were selected from each zonal university of KP for a balance representation. Overall, 50 participants were purposively selected for retrieving data. PRAAT speech detecting and processing software is employed for data collection and analysis. It analyzes data in terms of wave length, spectrogram, pitch, intensity and formants. It is capable of recording the sounds of speech, reflects duration of sounds, shows formants, wavelength, transcribes the words from audio file and even is capable of printing and saving files. The recording process involves mono sound recording with the help of microphone mounted in laptop. Data was annotated and transcribed enabling analysis. Words were also labeled and transcribed with RP and variant phonemes with the help of IPA symbols. Processed data is presented in the form of screenshots and analyzed on the basis of first and second formants and duration of each target sound.

ANALYSIS AND DISCUSSION

Distinguishing one vowel from other is ultimately based on the measurements of formants in the context of phonetics. The upper part of the mouth known as roof or hard palate offers reference point in the measurement of the position of tongue. The openness and closeness of short vowels are reflected by First Formant on PRAAT. The First formant is contrariwise proportionate to the height of vowel, the higher the vowel sound, the lesser First Formant. The segment of the tongue involved in the pronunciation is presented by Second Formant or F2. F2 shows the frontness and backness of the vowels. The followings are the screenshots of each variant English short vowel articulated by NSP.

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English short vowel /i/ at initial and medial level of word

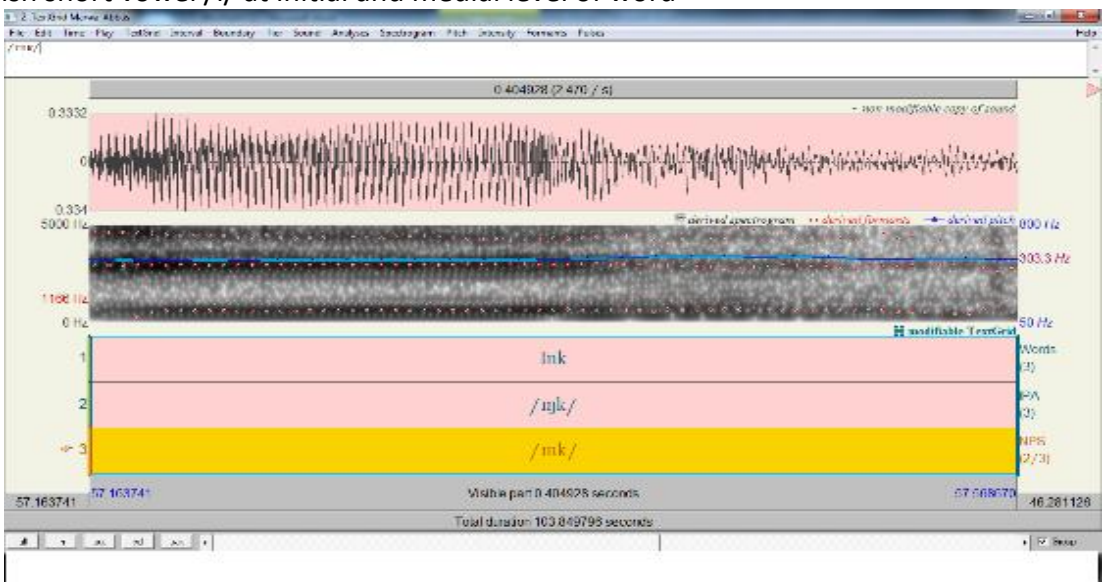

Figure 4.1 a

F1 881.8897771868545Hz (mean F1 in SELECTION) F2 3173.7591911343375 Hz (second formant in selected sounds) 74.61759517357937 dB (average-energy intensity)

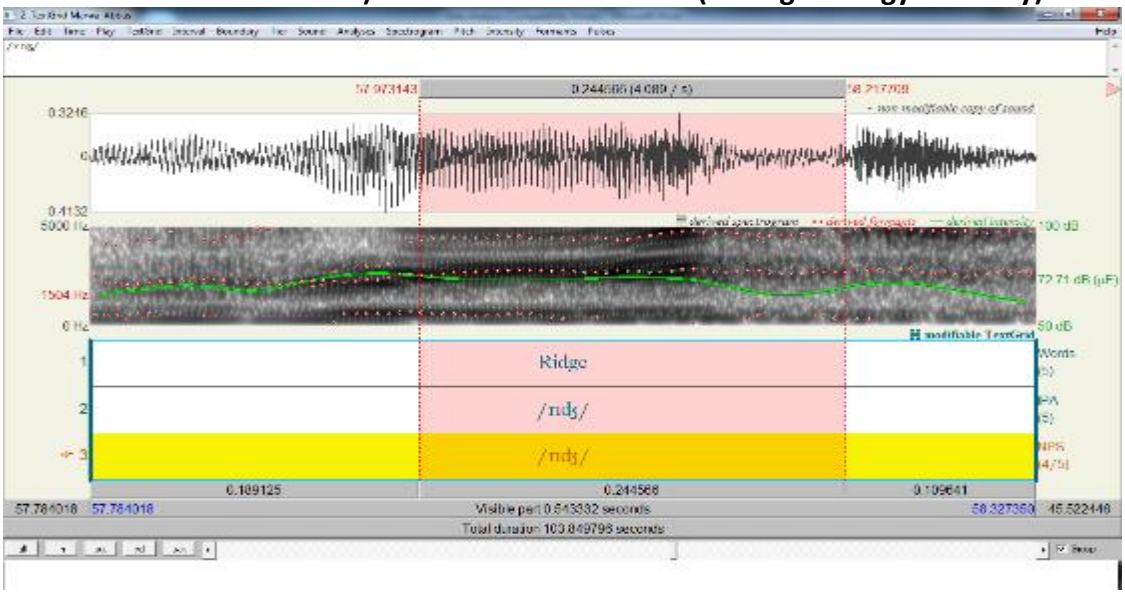

Figure 4.1 b

F1 881.73386409573 Hz (mean first formant in selected sound) F2 3172.429801754771 Hz (average second formant in selected sounds) 74.49161600553397 dB (mean-energy intensity)

First Formant of English short vowel sound /i/ at word initial and medial levels is lower which reflects a status between close and half-close spot in the pronunciation of vowel by the speakers of Pashto. Second formant F2 is displayed higher which shows the front segment of

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tongue, uttering the sound making it a front vowel. The prime most segment of the tongue hoists towards the rear part of alveolar ridge at the same time the tip is being slightly pushed downward. This is the manner peculiar to the pronunciation of short English vowel /i/ produced by the native speakers of hard and soft dialects of Pashto. Hence its articulation is detected with some kind of variation from the accurate pattern of Received Pronunciation. This may aid to the idiosyncrasy of variety of English specified to Pashto speakers in Khyber Pakhtunkhwa.

English short vowel /e/ at initial and medial level of word

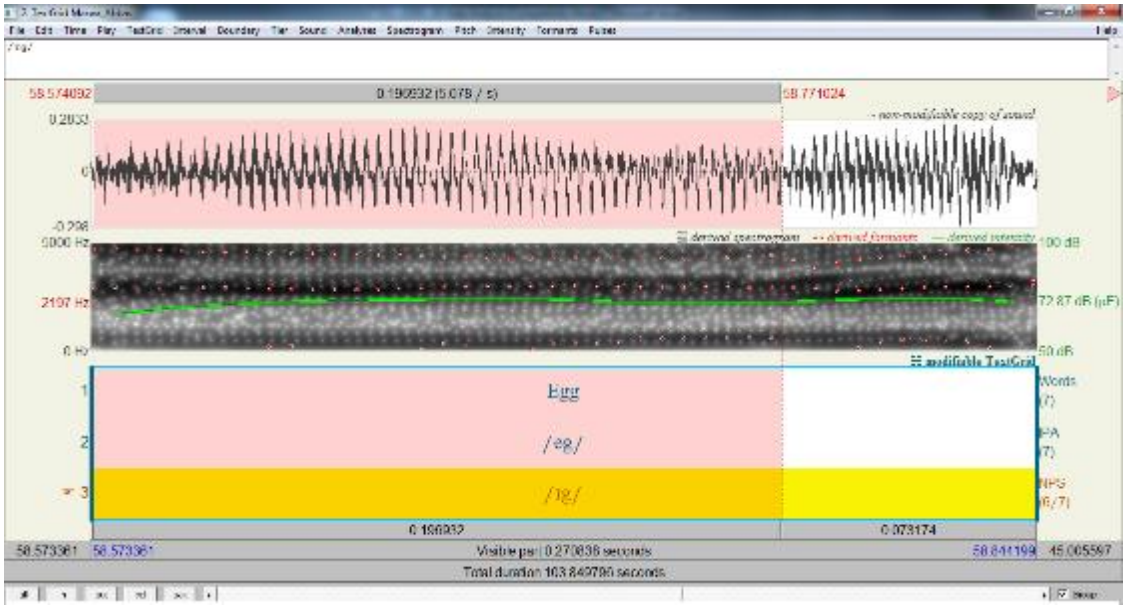

Figure 4.2 a

883.5415534265703 Hz (mean First formant in selected sound) 3170.2755234664664 Hz (average second formant in selected sounds) 74.86536043538759 dB (mean-energy intensity)

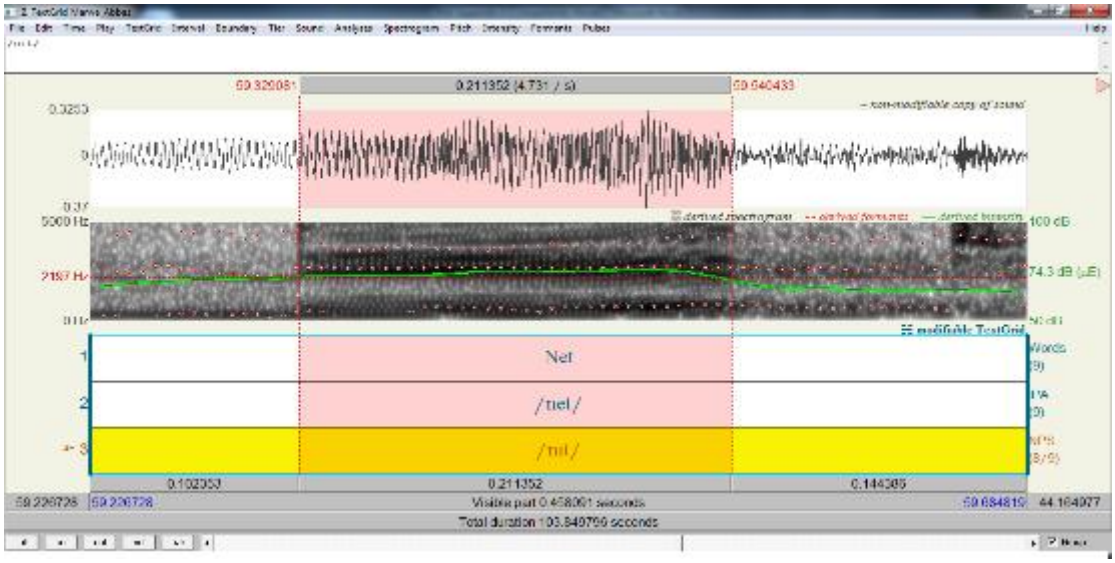

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Figure 4.2 b

F1 883.8825497233329 Hz (mean First formant in selected sound) F2 3171.6931356131886 Hz (mean second formant in selected sounds) 74.30092752613785 dB (mean-energy intensity in selected sound).

F1 of /e/ at both levels is lower which indicates the closeness of vowel sound by Native Speakers of Pashto. F2 is higher which shows frontness of sound, /e/ is pronounced with the anterior portion of the tongue ascends towards the posterior section of the alveolar ridge, accompanied by a subtle downward deflection of the tongue tip. Based on the acoustic measurement in the articulation of NSP, /i/ and /e/ are exposed with similar F1 and F2 values which suggest deficiency in distinction between target vowels. Remarkably, these speakers tend to articulate /i/ and /e/ with deficient phonetic and phonological differences that result in juxtaposition of these two phonemes. The broader pattern displays increase in first formant and decrease in second formant in /e/ instead of /i/. Hence the required difference between these two sounds is trifling as both of them are articulated in same manner to the extent of being identical. This acoustic analysis also exposes the intensity, frequencies of both F1 and F2 formants as well as duration of uttering /e/ explicitly identical to /i/. It demonstrates that the customary difference between the two target sounds is not detected in the English speech of the native speakers of Pashto. Resultantly, the potent contrast between these two phonemes is abridged which makes them compatible phonemes. As the difference between these distinct sounds are not maintained consistently, the articulation results in variant form of pronunciation. Notably, the front-mid-close vowel /e/ and the front-close vowel /i/ have same pronunciation resulting in variants of the RP phonemes. This indicates that the articulatory setup of the native speakers of Pashto does not differentiate the two sounds from each other.

English short vowel / æ/ at initial and medial level of word

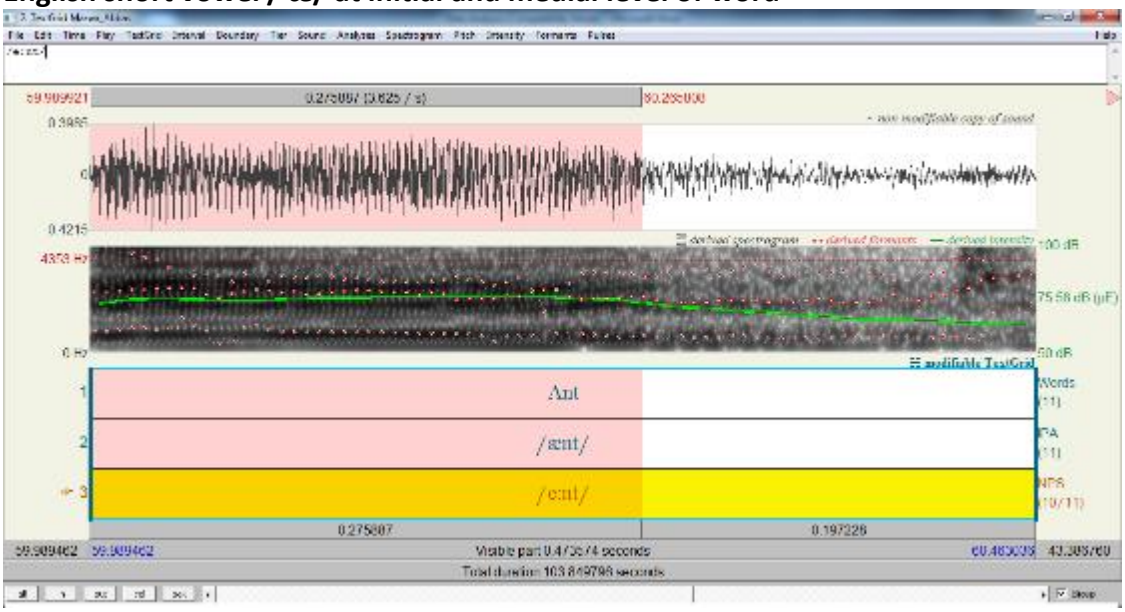

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Figure 4.3 a

891.7558472270549 Hz (mean F1 in SELECTION) 3097.1881796178336 Hz (average second formant in selected sounds) 75.58194579149435 dB (mean-energy intensity

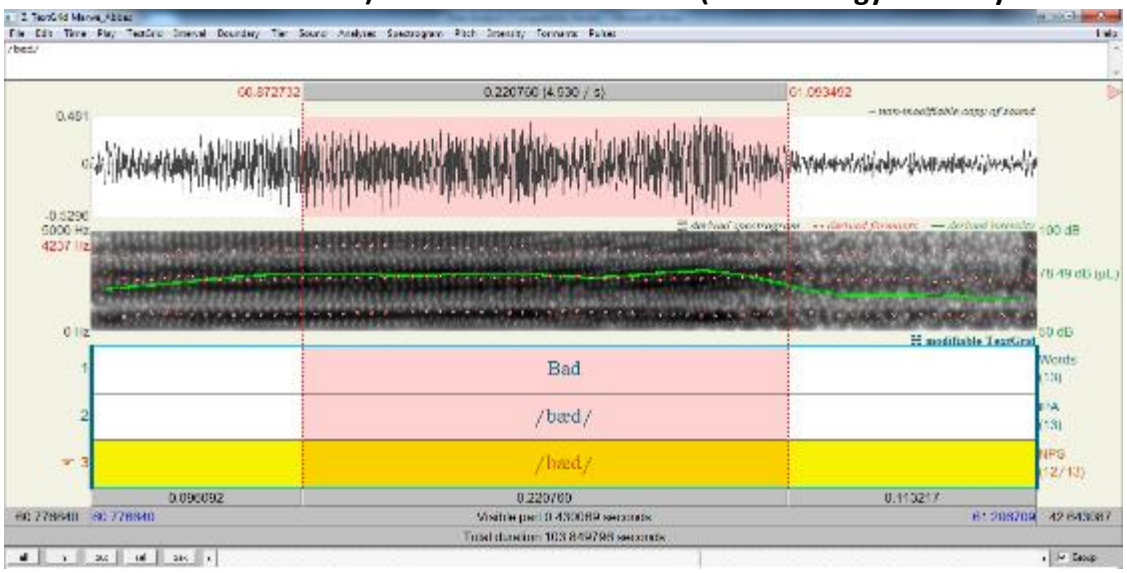

Figure 4.3 b

891.4717144943373 Hz (mean F1 in SELECTION) 3099.7900079221363 Hz (average second formant in selected sounds)75.4853394115627 dB (mean-energy intensity in selected sound)

The Received Pronunciation of open mid phoneme denoted by /æ/ in International Phonetic chart (IPA) is uttered with explicit variation by native speakers of Pashto. The PRAAT analysis of /æ/ displays variations in the first and second formants, duration and intensity which reflect a pattern that is different from Received Pronunciation.

Significantly, words that are built on this target phoneme like /bæd/, /ænt/ are articulated with closer proximity with long vowel /e:/ or short /e/. this demonstrates that the native speakers of Pashto articulate the open mid vowel /æ/ as front-close vowel /e/ at word initial and medial positions thus violating the standards of Received Pronunciation. In short, the native speakers of Pashto substitute /æ/ by /e/ which is a low unrounded phoneme grasped as mid-front vowel. Furthermore, RP phoneme /e/ is uttered with somewhat elevated position of tongue, subsequent in a relatable closeness with the impression of /æ/. Hence as a result the apparent difference between /æ/ and /e/ is minimized to the extent of closest proximity. Somewhere the distinction between the long phoneme /e:/ and this short /æ/ vowel is very minute as both of them are articulated with same frequencies. This analysis demonstrates that the customary articulatory difference between /æ/ and /e/ are not maintained by the speakers of Pashto directing towards visible overlap between the two phonemes. The apparent difference is reduced and the overall pattern of decrease in second formant and increase in first formant indicates a juncture between the target vowels. As discussed earlier that First formant displays the resonant frequency of vocal tract, having higher degree presents wider and more

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open tract. Similarly, this elevation in the first formant of /e/ and not in /æ/ displays wider and more open vocal tract configuring /e/ instead of /æ/. This is consistent in the pronunciation of native speakers of Pashto with all the apparent features of /e/.

English short vowel /ɒ/ at initial and medial levels of words

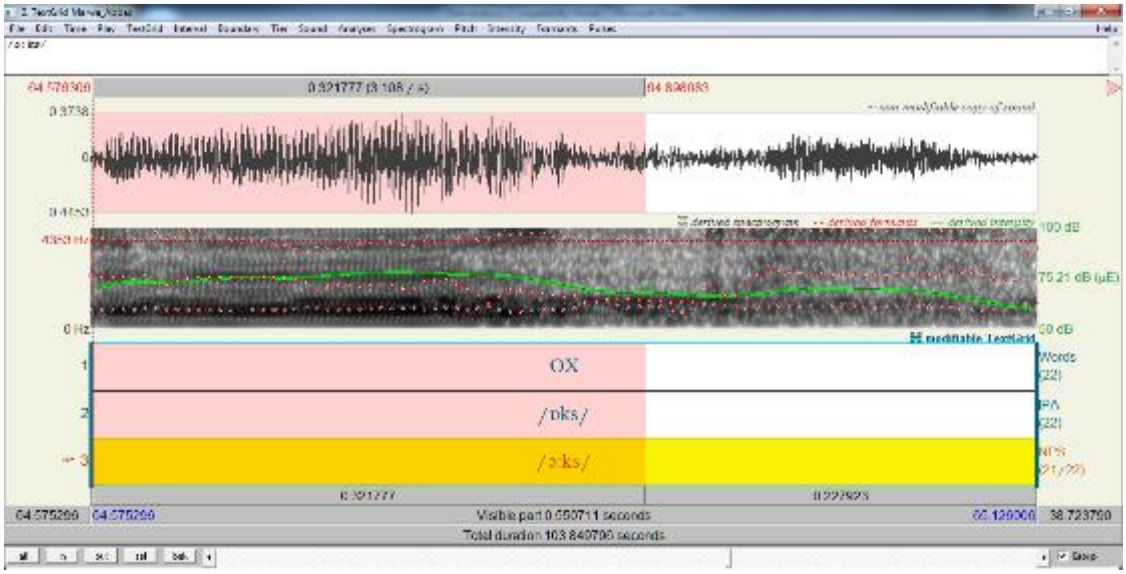

Figure 4.4 a

890.7191622866736 Hz (mean First formant in Selected sound) 2563.9315112407266 Hz (average second formant in selected sound) 74.84483820887384 dB (mean-energy intensity in selected sound)

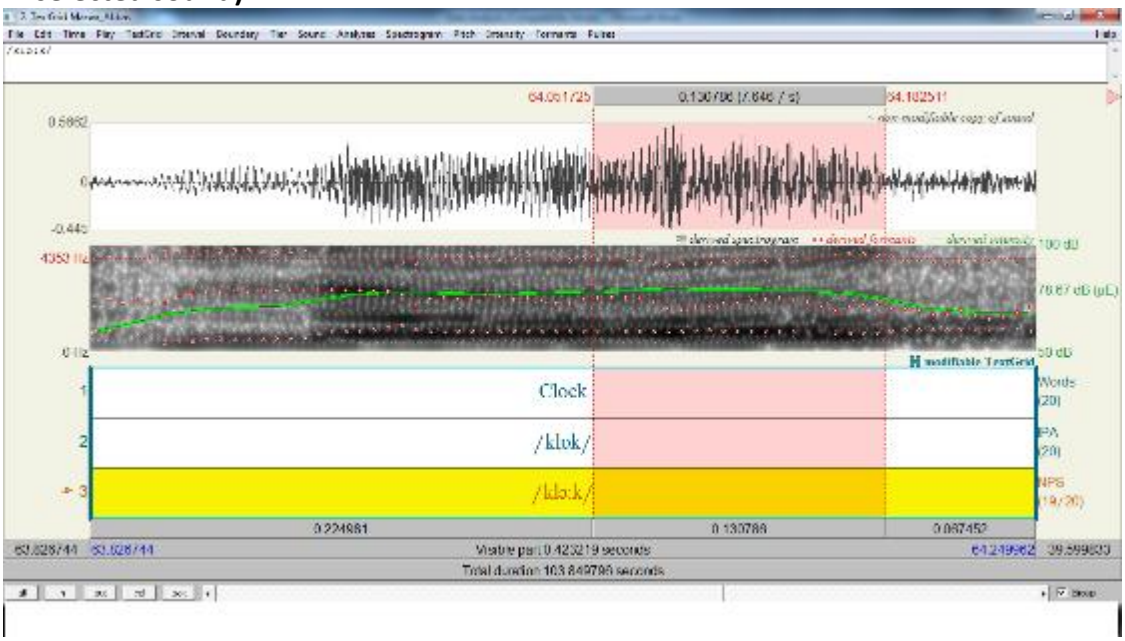

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Figure 4.4 b

890.7699214346088 Hz (average/mean First formant F1 in Selected sound) 2558.7717117514176 Hz (average second formant in selected sounds) 74.67429107435 dB (mean-energy intensity in selected sound)

Words like <ox> and <clock> that contain the vowel sound /ɒ/ at word initial and medial levels, when pronounced by Native Speakers of Pashto (NSP), exhibit a very minimal difference from the vowel sound /ɔ:/. In fact, the duration, F1, F2, and intensity of both sounds are almost identical. Precisely, the pronunciation of words like clock, hot or pot by the native speakers of Pashto, all the duration, first and second formants are equal to the features of /ɔ:/. The PRAAT analysis reveals that the mean values of these formants demonstrate the articulation of this vowel as at half open status with back part of the tongue showcasing the half-open status of the back of the tongue. It shows that the articulation of /ɒ/ has half-open back articulatory status which is basically the feature of long vowel and that this is variant from the comparatively open as well as central position of /ɒ/ of Received pronunciation (RP). These status and position of tongue indicates variation in the pronunciation of /ɒ/ by the native speakers of Pashto.

English short vowel /ə/ at initial, medial and final levels in words

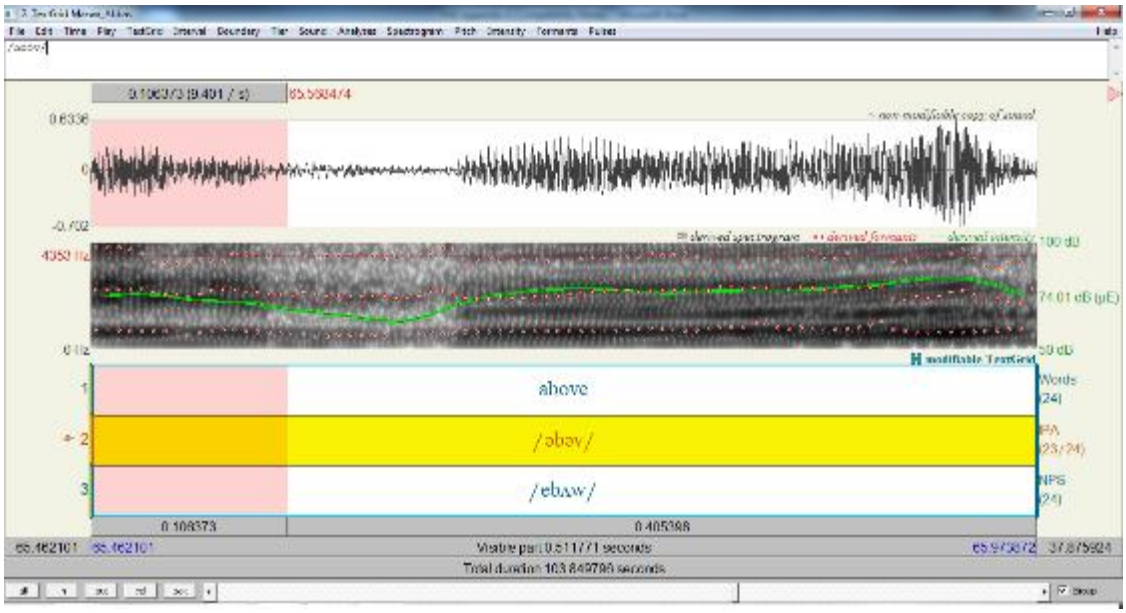

Figure 4.5 a

883.5671965450515 Hz (mean First formant F1 in selected sound) 3159.467242898385 Hz (average second formant in selected sound) 73.01399689346928 dB (mean-energy intensity in selected sound)

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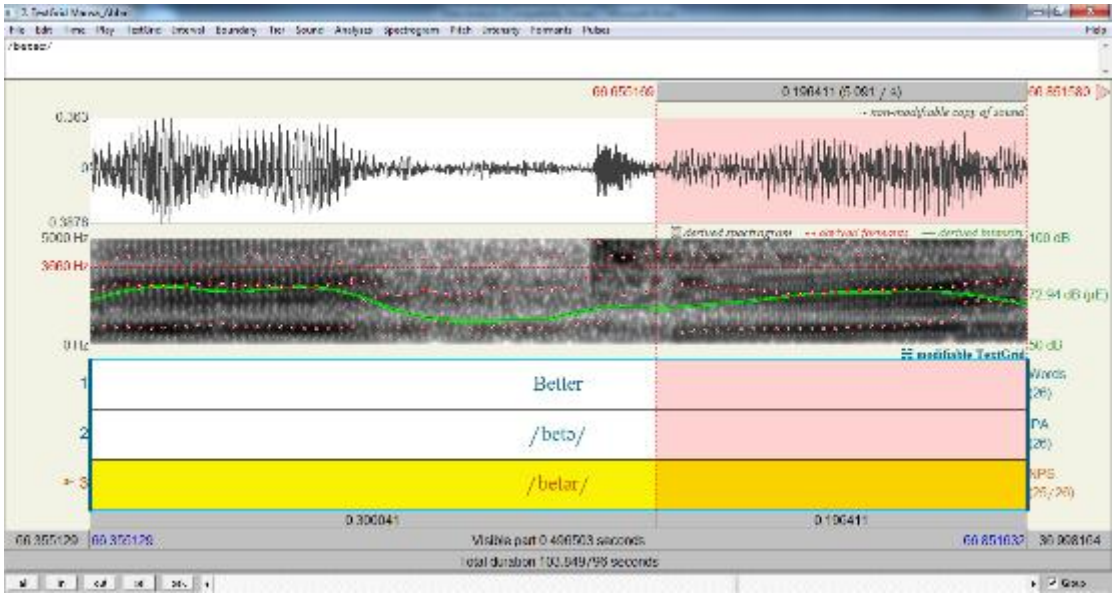

Figure 4.5 b

886.5575199580267 Hz (mean First formant F1 in selected sound) 2851.084147484154 Hz (average second formant in selected sounds) 73.94061786575797 dB (mean-energy intensity in selected sound)

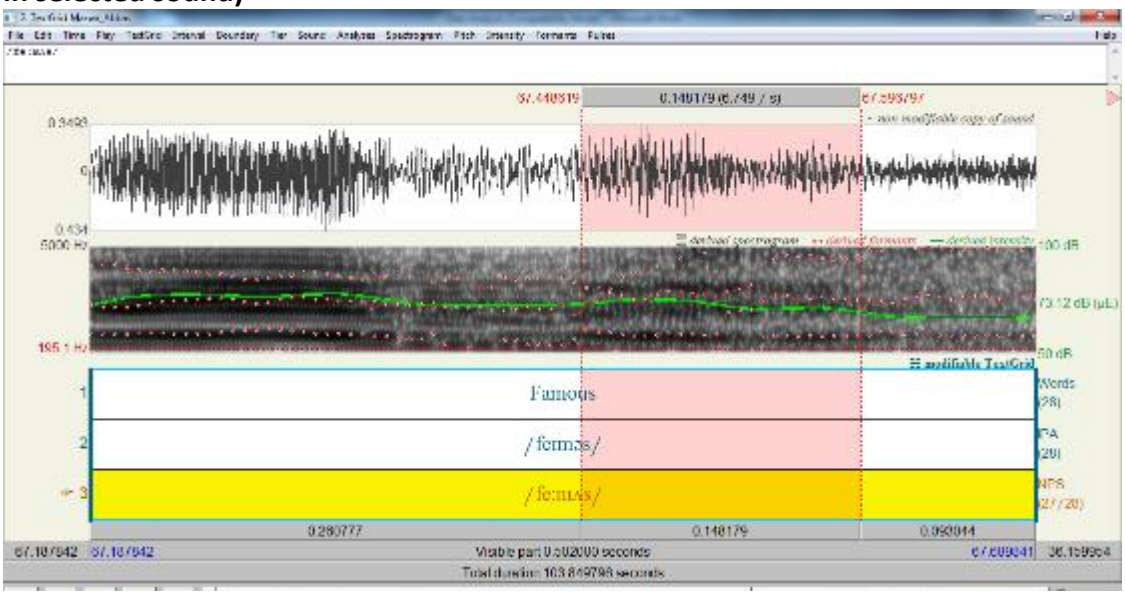

Figure 4.5 c

886.5177461729953 Hz (mean First Formant F1 in selected sound) 2853.003394991785 Hz (mean second formant in selected sound) 73.11952361574306 dB (mean-energy intensity in selected sound)

Fascinatingly, the RP of /ə/ as represented by IPA chart is completely deviant in its articulation by native speakers of Pashto. The inconsistency in the production of this short vowel sound

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makes it a paradox due to its simplest and at the same time complicated nature in pronunciation. If on one hand its central and neutral status of tongue makes its pronunciation complex, necessitating an accurate placement of tongue with least movement, on the other side, the absence of this movement in the position of tongue makes it stress free and easy phoneme to articulate. This extraordinary blend of simplicity and complexity makes /ə**/** a captivating phoneme valiantly used by native Pashto speakers. The articulation of weakest English phoneme /ə/ faces and goes through noteworthy challenges in the speech of Pasho speakers. It is assumed as the most variant sound in their production of words built on /ə/ either at initial, final or even at medial levels. For instance, the NSP incline to rely on the orthographic features that molds their pronunciation and /ə**/** is inconsistently spelled in English as indicated in words like of, and, button, father etcetera which becomes another cause of complication in its pronunciation. Hence NSP alternatively pronounce /ə/ with inconsistent degrees of precision and facing it as significantly tough phoneme to master in RP. The acoustic characteristics of the sound /ə/ in various words, including its F1, F2, duration, intensity, and spectrogram, vary significantly depending on the orthography. This sound is fundamentally an oral phenomenon, and its pronunciation is not consistently represented in the spelling system of English. Preferably, the orthographic system of a language should precisely represent and reflect the pattern of pronunciation (Ghani, 2015) but English in this regard has no one to one correspondence between its sounds and graphs. The graphemes of English do not corelate to its phonemes that cause challenges in the pronunciation of sounds like /ə/. In the word <above> /ə/ is either replaced by /e/ or /ʌ/. In words <famous> /ə/ is replaced by /ʌ/ and in <better> by /ʌr/ based on the Rhotic feature of this variety of English. F1 and F2 of schwa sound varies but it shows inclination towards /ʌ/. English schwa is most probably replaced by /ʌ/ in the English pronunciation of NSP. RP speakers showed a greater difference in the way they pronounced the vowels /ə/ and /ʌ/, using different tongue positions for each. NSP, on the other hand, pronounced the two vowels more similarly, with less distinction in tongue position. The PRAAT analysis of /ə/ indicates that the phonetic difference between two short vowel sounds is neutralized by Pashto speakers. This proposes that the acoustic differences of these vowels are less indicative in the phonemic inventory of Pashto language.

Such variations in the pronunciation of RP vowels were examined in different phonemic environments and indicate flexibility in the articulated pattern of Native speakers of Pashto. Furthermore, the similarity index in the pronunciation of /i/ and /e/ demonstrate the alternative use of them as free variants which means that the target population use both of them interchangeably without intending change in the meaning of minimal words. Hence the distinction between both become blur. In the same way the replacement of RP /æ/ by /e/ also show tendency of flexible pattern across linguistic diversity. The target population is detected with these substitution of RP vowels by other vowels to ease their pronunciation patterns. Likewise, the substitution of /ɒ/ by /ɔ:/ in the production of NSP, the tendency is to replace the short open and back vowel sound by long half open back vowel sound. Such variance displays existence of flexibility in the utterance of back monophthongs by the target population. Finally,

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the target population's articulation of /ə/ an open mid central vowel is entirely replaced by /ʌ/ which is a mid-open central short vowel sound. Thus, /ə/ is realized as /ʌ/ by the whole target population in their articulation of the respective phoneme neutralizing the essential contrast between the two. The overall examination of these RP short vowels and their variant manners in respect to the status of tongue that determines height allay with the reviews of Neary's (2013) and suggest that First Formant is more significant than Second Formant. First Formant displays the height of tongue that determine the manner of articulation of vowels as compare to the part of the tongue representing front and back status. Such significance of first formant become apparently crucial in comparison of language having diverse phonological pattern whereupon the variation is measured in form of distance between the surface of the tongue and hard palate.

Vowels articulated by the non-native speakers of English are attributed with major variations as compare to consonants (Wang, Jia, Li & Xu, 2016). The tongue positions and part of non-native speakers of English diverge a lot in the production of vowel sounds as compare to English consonants. Though some English vowels are produced like native speakers (very few in numbers) but more others are produced with different tongue position (MacKenzie, 1959). Observation and violation of minute change in the position and part of tongue create variations from RP. Hence English vowels are more variant for Pashtun speakers than consonant sounds because variations in languages are found mostly in vowel sounds (Al-Badawi, & Salim, 2014). The reason behind this is that the part and position of tongue in the production of vowel sounds go through minute changes of close, half-close, half-open and open positions simultaneously with tip, blades, front and back part of the tongue respectively. However, Pashto speakers demonstrated native-like production of vowels /ʊ/, and /ʌ/, with accurate height but varying backness. Notably, the vowels /ə/ and /ɒ/ were produced almost distinguishably from native speakers, with significant differences in height and backness. These findings highlight variations in vowel production which reflect uniqueness and cause indigenization of English short vowels by native speakers of Pashto in the context of Khyber Pakhtunkhwa.

CONCLUSION

The PRAAT analysis of the short vowels of Received Pronunciation in the speech of native speakers of Pashto made it evident that though variations exist in more vowels, yet some notable vowels demonstrate excessive variability and necessitates comparatively more attentive investigation. The above investigated variant vowels are prone to fluctuation. It is concluded from the analysis of F1, F2, mean intensity on spectrogram of each monophthong that Native Speakers of Pashto (NSP) frequently adapt English phonemes by substituting them with variant vowels, revealing a common pattern of adaptation in their pronunciation of English monophthongs. The process of this adaptation encompasses the replacement of the vowels of target language by the vowels of source language displaying substantial impact of native language. The PRAAT processing's demonstrate that in the utterance of RP of English monophthongs short vowels, the native speakers of Pashto:

1: do not discriminate between /e/ and /i/

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2: replace short open-front /æ/ vowel by short half-closed front /e/ vowel
3: substitute short vowel /ɒ/ by long vowel /ɔ:/
4: replaces /ə/ by /ʌ/

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