Acoustic Behavior of RP Diphthongs in Pakistani English (PakE)

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Abstract

In this research, the acoustic behavior of RP diphthongs has been analyzed in Pakistani English (PakE). A diphthong is a gliding movement from one vowel to another. Received Pronunciation (RP) has eight diphthongs; comprised with long and short vowel combinations. Contrarily, this condition is not compulsory for PakE as speakers show difference in the articulation. It is understood that two diverse languages are following different approaches. If there are some similarities, those are just coincidence. Presently, it has been proposed that Urdu effects the pronunciation of RP diphthongs. Therefore, two different experimental approaches have been selected for the identification of RP diphthongs and their acoustic behavior in PakE. Firstly, auditory approach has reported vocalic segments by using syllable count technique. Secondly, the identified segments have been acoustically investigated in PRAAT software. Data analysis and results have reported that Urdu language has influenced and transformed the features of PakE. According to the results, two diphthongs have been articulated as monophthongs (/o/ and /e/). Coincidently, four RP diphthongs have been identified as diphthongs (/aɪ/, /ɔɪ/, /aʊ/, /eə/) but only at word medial position. Two diphthongs (/eə/ and /ɪə/) have behaved as merger (/eə/). Whereas, one diphthong has been articulated in three different forms; it may be uttered either as a diphthong (at word medial position as /ɔɪ/ and /ɔe/ at word final position) or as a triphthong (/ʊae/). Although, these segments are not the part of British inventory but they are autonomous phonetic segments of PakE.

Key Words: RP diphthongs, Pakistani English, auditory and acoustic analysis

1. Introduction

This research is done to deal with the conundrum which has being faced by non-native speech communities. It also demands standardize models and norms for solving internal variations among different “Englishes”. Therefore, this study is based on the contrastive analysis of speech by identifying acoustic differences in the behavior of RP diphthongs in PakE. These acoustic variations occurred due the nativeness effect of first language, Urdu which is the hypothesis of this research. For confirming it, two experiments have been done. In first experiment, auditory

analysis has identified the differences in vocalic segments of both varieties. In the second experiment, acoustical analysis has identified the physical changes in PakE. Results have proved the idiosyncratic behavior of RP diphthongs in PakE. Although there exist some similarities but may occurred coincidently. The results are based on the evidence therefore would be positive addition in the vocalic inventory of PakE. It will also acknowledge PakE as an independent variety among world Englishes.

It's also true that PakE falls under the British Standard by showing some differences. There are number of factors which cause language change and variation in Pakistan. The foremost reason might be learners' acquisition. As, L2 learners acquire English language by Pakistani (non-native English) teachers which directly effects the pronunciation of English language. But the present research is about the behavior of RP diphthongs. The pronunciation of RP diphthongs is the major controversial difference in PakE which has been identified. Although, Ladefoged (1982) has claimed 24 consonants and 20 vowel sounds in PakE but he said diphthongs are the confusing sounds for Pakistanies. Thus, the present research has identified diverse acoustic behavior of RP diphthongs in PakE. It's also understood that every language has unique phonemic inventory which is different even within the dialects and accents of a language.

On realistic grounds, inter-languages have some similarities because they share same developmental orders (Hulya, 2009). Being Pakistani L2 learners, we people have being faced different socio-academic problems along with acoustic training of our vocal apparatus but unable to highlight them. As, we are living in a multilingual country where Urdu is a national language (Rehman D. T., 2006) and mother tongue (Zia, 2011) among other 60 regional languages (Farooq, 2015). But English also enjoys the status of an official language (Rehman T. , 2002). Therefore, English serves different roles in international communication, national identity, economical progress and access to modern technologies (Kavaliauskiene, 2009) (Mehboob, 2003).

On the other hand, Urdu is a largely spoken and comprehended language. Therefore, it directly or indirectly influences English Language Teaching and Learning (ELTL) in Pakistan. As, language is a living organism therefore accepts continuous changes and diversities (Amberg & Vause, n.d.). It has also been observed that there is a close relationship between language

acquisition and language learning. So, it would be right that language acquisition is the initiator of an utterance and learning is the monitor (Koucka, 2007). Therefore, in this research, data interpretation has been done by considering this relationship.

In Pakistan, English is a powerful medium of instruction. According to the education policy of Pakistan; it is a compulsory subject for all the learners in public and private sector (Lewis, Paul, Simons, & Fen, 2016). Consequently, it is self-evident for Pakistanies that English is the only key to success in every field of life. It would not be wrong if said that English learning has been stressed to struggle in the communication competition of the world (Romaine, 1994). Therefore, this study will prove beneficial for English language learners and teachers.

1.1.Research Questions

The hypothesis of the study is whether the prior knowledge of Urdu will affect Pakistani English or not? Therefore, this research will answer the following questions;

a. Is there any RP diphthong in PakE? If yes,
b. Is the acoustic behaviour of RP diphthongs different in PakE?

2. Literature Review

In Pakistan, this research would be first work for analyzing RP diphthongs based on the acoustic differences in PakE. This part will also discuss these differences and their reasons. Before starting the actual matter, the status of English is the most important point of discussion. As, the spread of English language is a debate; based on these questions: (i) is it the effect of linguicism or imperialism; (ii) English learning is an actually inner desire of people or (iii) it might be useful for knowing the cultural norms of people who speak it? According to Kandiah (2001), there is an inherent contradiction among the people in postcolonial era. But in reality, it's an argument for the existence of 'standard' English or many Englishes (as cited in Kirkpatrick, 2004).

People who are in favor of imperialism argue that British or American English increases at greater extent in all over the world. They also argue that both Englishes bring Anglo-cultural norms with them. Therefore, learning English does not only limit with the language learning but also deals with adopting British and American cultural norms (Rehman D. T., 1999). They have fear that English will threaten their thinking, culture and language as well (Kirkpatrick, 2004).

On the other side, people have realized the need to learn English as an international language. Some people and institutions are interested in the importance of English spreading for their own commercial and political benefits. For example, British Council is working with the purpose to build a mutual relationship among the people of UK and other countries (Sharifian, 2004). This mutual relationship ultimately becomes the cause for standardizing the local English as an individual variety.

Kachru says that local Englishes reflect local cultures and norms. Non-Anglo ways of thinking would receive attention by English language. He gives 'polymodel' instead of 'monomodel' for classifying and standardizing English varieties (as cited in Kirkpatrick, 2004). Different emerging Englishes express the cultural conceptualizations and national struggle of a specific language community. Even though, traditional SLA paradigms are identified variations as 'negative transfer' based on the so called 'native variety'. But in reality, these varieties must be evaluated on their own cultures. For example, Persian English must be judged under the banner of Persian cultural conceptualization rather than with American English. Since communicative strategies of speakers are psychologically depends on their culture. No doubt, in second language learning, speakers' cognitive, cultural and social horizons expand but emotional experiences remain unfeasible. Therefore, the speakers of overlapping non-native varieties share mutual cultural and communicative conceptualizations (Ramanujan, 1990).

English is a global language and has come into contact with a number of different languages. Evidently, about eighty percent English communication has been taking place in non-native countries (Sharifian, 2004). Consequently, English has been under a continuous process of changing in different ways (Modern Englishes, 2012). The same is the purpose of this research to study PakE with reference to native language, Urdu which would deal in subsequent sections.

2.1. Effect of First Language on English Language Learning

Dulay and Burt (1974) have suggested that mother language is influencing L2 production. Therefore learners have not been able to recognize their second language alternations. So, it has claimed if non-native speakers learn L2 without their native language they would be more fluent. In past, second language teaching has taken place by using Grammar Translation Method (GTM) (Tema, n.d.). Second Language Acquisition (SLA) along with the

help of first language creates challenging situations for learners. But it has also been claimed that the prohibition of one language and authorization of another would produce nervousness and anxiety among learners (Amberg & Vause, n.d.). SLA is a systematic process where language specific phonological constraints add the flavor of native language (Mahmood, Hussain, & Mahmood, 2011) which is a normal language behavior.

In Pakistan, English is emerging and developing as a "must-have language" due to its significant role in different fields of life (Mahmood, et al., 2011). According to education policy of Pakistani Government, it is also required for bilingual means of education (Mahboob & Jain, 2016). Along with this, Higher Education Commission (HEC) has launched English Language Teaching Reforms (ELTR) program to revolutionize the existing teaching methodologies. Consequently, teachers' training would lead to achieve the required results because a passive policy without any practical implementation could not bring any change in reality (Mehboob, 2003).

In Pakistan, it has also been observed that English usage is not restricted to the educated people but even uneducated people are using English loan words due to the influence of media and class consciousness. But the process is going through a continuous make-up caused by the phonetic constraints of their native languages which ultimately cause multiple variations in pronunciation (Riaz, 2015).

In Pakistani English literature, "Urduised" words are directly influencing PakE by causing a number of lexical innovations. This vocabulary shows distinctive and indigenous cultural impact in using dynamic lexis of Pakistani culture. It also bridges the localization by representing an independent linguistic norm which makes PakE an independent variety among world Englishes (Ahmad & Ali , 2014). All these studies reported the nativeness effect of Pakistani first languages on Standard English which gives the way to an autonomous English variety.

2.2.Pakistani English (PakE)

Linguistic differences become an obvious reason for dialectal variations in PakE (Schneider, 2010). Actually, first language defines the regional dialects of English variety in a specific country. Pakistan is a multilingual country where more than 60 different languages are

being spoken in different geographical areas (Farooq, 2015). In such country, borrowing complications would cause dialectal variations in English because speakers are more influenced with their first languages. Even though, people are living in same country but are language user of at least more than two different indigenous languages. Therefore, phonological variations occur due to; (i) complex language contact, (ii) social interaction, (iii) gender differences, (iv) educational variations, (v) geographical shifting, etc. (Mahboob & Szenes, 2010). PakE has identified in different perspectives such as; phonology, morphology, syntax, and semantic. Phonologically, it is distinctive by having different consonantal and vocalic features (Khan, 2012). Urdu and Punjabi also have influenced PakE with vowel alternations and substitution (Hussain, Mahmood, & Mahmood, 2011). These variations have been briefly discussed here.

2.1.1. Vowel Alternation

Kachru (2005) claimed that Pakistani English speakers could not maintain the distinction between /e/ or /æ/, along with long /i:/ and a short /ɪ/ vowels. But these claims have been refused later (Bilal, Mahmood, & Saleem, 2011a) (Bilal, Mahmood, & Saleem, 2011b). According to another research, PakE speakers could not distinguish between /ə/ and /ɜ:/ vowels because there is no /ɜ:/ sound (Mahboob & Ahmar, 2004) in the phonetic inventory of Urdu/Punjabi (Hussain, et al., 2011), (Bilal, Mahmood, & Saleem, 2011c).

2.1.2. Full Vowel Articulation

PakE belongs to the outer circle Englishes where full vowel articulation is a shared tendency among different speech communities. There is no possibility of reduced vowel production even in unstressed articulation (Crystal 2003). If these patterns are not following standards of RP still would be identified as one possible standard. Then ultimately, non-native English teachers would continue their norms of pronunciation with confidence (Kirkpatrick 2007). Moreover, they would believe that English belongs to them as much as to anyone else (Deterding, 2010). This principle supports the present research as the language nativeness affects the phonological or acoustic differences by showing alternative pronunciations. Alternative pronunciation would occur due the change in phonetic inventory of the second language.

2.2.Phonetic Inventory

Every spoken language has its own phonetic inventory which is the combination of consonants, vowels, monophthongs, diphthongs and triphthongs (Roach, 2009) (Skandera &

Burleigh, 2005). By considering the research scope, except consonants, all of these phonemic segments have been briefly introduced here.

2.2.1. Vowels

Phonetically vowels are produced without any constriction in oral tract. Phonologically, it occupies the central position in a syllable. In speech production, they are essential segments as the sound quality of a language is based on the intensity, loudness, pitch, and frequency of vowels. RP has twelve vowels while different accents might have different number of vowels. All English vowels are voiced, oral and articulated with open oral tract along with the slight movement of lips and tongue (Roach, 2009).

2.2.2. Monophthong

Monophthong is a vowel sound but has no separate phonetic symbol therefore indicated by using vowel symbols. The sound of a monophthong is fixed from the start till the end of a vowel therefore is called "*monophthonggos"*. A monophthong is different from a vowel by showing large segmental duration which may be equal to a diphthong. It has contrastive properties as compared with a diphthong or triphthong. The conversion of a monophthong into a diphthong and vice versa is a prominent feature of language change (Mahajan, 2014) and this process is called diphthongization (Kohnlein, n.d.).

2.2.3. Diphthongs

There seems no apparent consensus on the phonetic definition of diphthongs. According to some linguists, it has dual targets and transition period. Interestingly, onset must be considered a default element for the phonetic definition. But the transition period and offset position are always equally essential for the acoustic realizations. Diphthongs have no different phonetic ID therefore normally used combination of vowel symbols for transcription. RP has eight diphthongs. More exactly, they start with one vowel then the sound quality changes into another vowel with the gliding movement of tongue. These sequences are also called *vowel glides, gliding vowels***,** or *diphthongs* [from Greek *"diphthonggos"* which means 'double sound']. They can be categorized into three groups: (i) *centering diphthongs* (ii) *closing diphthongs* and (iii) *opening diphthongs* (Lee, Potamianos, & Narayanan, 2014). According to Roach (2009), English diphthongs are divided in following way:

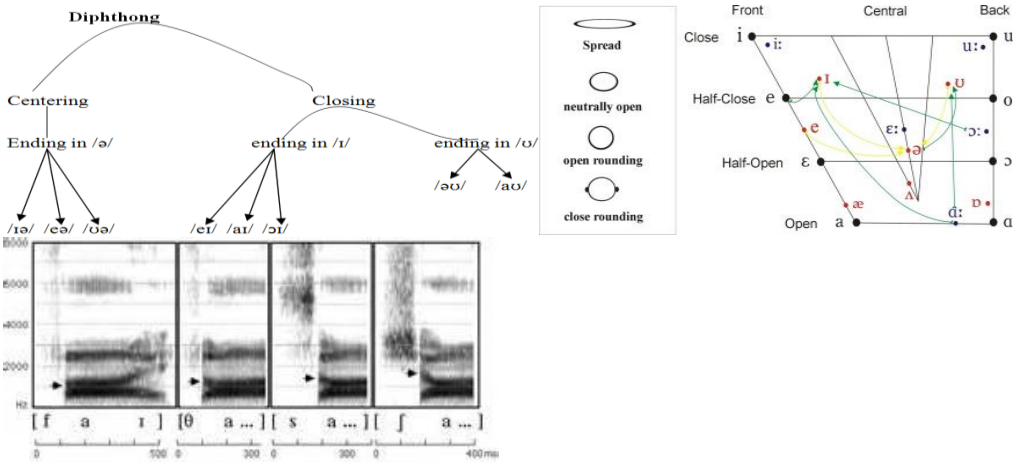

Figure 1: RP Diphthongs

Another categorization has divided them into descending, and ascending diphthongs. When the first vowel is longer and louder than second, it would be called *descending diphthong*. All English diphthongs are descending in manner. If the second vowel is more prominent than the first, it would be called *ascending diphthong* but this condition is very rare in English. Acoustically, diphthongs are characterized with the movement of formant frequencies of both vowels from onset to offset position. Especially the second formant frequency (F2) is more important for identification. The rate of change for F2 is always different for the transition period of each diphthong therefore proves a discriminating parameter for them (Lee et al., 2014).

2.2.4. Triphthongs

English also has archetypal vowel sequences which consist of three sounds known as triphthongs [derived from the Greek word "*triphthonggos"* means 'triple sound']. In RP, there are five triphthongs; /eɪə/, /aɪə/, /aʊə/, /ɔɪə/ and /əʊə/. All triphthongs are consisted of closing diphthongs entailed by a schwa sound.

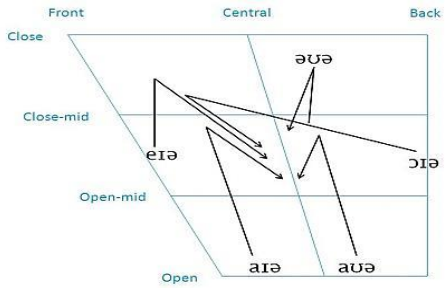

Figure 2: British English Triphthongs[1]

Different researchers have described triphthongs in different ways. According to Peter Roach, they are most complex English sounds, difficult to pronounce and recognize. It is an uninterrupted glide from one vowel to second and second to the third (Roach, 2009). But their pronunciation is the major cause of difficulty for L2 learners. Secondly, segmental duration is very short except in conscious pronunciation. Thirdly, the middle vowel loses its phonetic features due to the influence of surrounding vowels. Fourthly, there is difficulty for the non-native speakers whether a triphthong has felt to comprise of one syllable or two (Wells, 2009).

Summing up the whole review of literature, English is a global language which is essentially required for growing in all fields of life. Therefore, it is being used by a large non-native population for individual as well as national excel. Consequently, non-native speakers add the flavor of their first languages consciously or unconsciously at different levels. Among them phonological variation is apparently visible in their speech. It also confirms that every language has its own phonetic inventory where vowels are most significant speech segments. As, the speech quality is based on the quality of vowels' frequency, intensity, pitch, loudness, etc. Diphthongs are important and complicated part of vocalic inventory. RP has eight diphthongs but literature review refused their presence in PakE. This present research has investigated the presence of RP diphthongs and their acoustic behavior in Pakistani English variety.

3. Methodology

The nature of study is epistemological which is directly related with positivism as it has acquired the results by using the analytically scientific methodologies. So, the area of acoustic phonetics has been selected for contrastive analysis of PakE with reference to RP diphthongs. The purpose of the study is to investigate whether Urdu phonetically influences PakE or not.

[1] http://www.phonologythree.blogspot.com

Therefore, by using convenience sampling method, thirty Pakistani speakers have been selected as research sample. Their speeches have been acoustically analyzed in PRAAT (Boersma & Weenink, n.d.) for finding out the possible acoustic variations. So, the list of words which is comprised of RP diphthongs has been selected to make text corpus (10 sentences) for recordings. Later, the speech has been recorded in anechoic chamber at the sampling rate of 48 KHz in PRAAT.

This speech corpus has been annotated. Each vocalic segment would be marked phonologically not phonetically by using Case Insensitive Speech Assessment Method of Phonetic Alphabets, CISAMPA (see appendix). Vocalic segments have been analyzed physically by measuring their segmental differences i.e. alternation, durations, formant frequencies, etc. Afterwards both speeches have been compared for identifying unique acoustic behavior of PakE.

Thirty Pakistani English speakers (12 males and 18 females whose ages vary from 25 to 30 years) have been selected for this research. According to the research requirement, all speakers are not professional vocalists but all of them are graduates. The purpose behind the selection of this group is their good understanding of English language. The other main reason is that a graduate person would be equally influenced and attached with his/her mother language as with the second language, English. Their speech has been served for developing an annotated speech corpus. Later, this annotated speech corpus has been used as data for analyzing speech variations.

4. Data Analysis and Results

It is a comparative research to identify acoustic behavior of RP diphthongs in the speech of Pakistani speakers. But it is difficult to approach native English speakers therefore vocalic inventory of British English has been selected as a model for comparison. The whole analysis has been divided in two steps; (i) auditory experimental methodology and (ii) acoustic experimental methodology.

4.1. Auditory Experimental Methodology

Auditory experimental methodology is based on the listening skills and comprehension of the linguists. The selected text has been asked to record by thirty PakE speakers for verifying the hypothesis. The used text has eight diphthongs (10 sentences x 8 vocalic segments x 3 repetitions

x 30 speakers = 7200 utterances). Every speaker has been asked to utter each word three times. Afterwards these recordings have been asked to listen by two linguists for identifying the gliding segments in each word. For this purpose, a checklist has already been constructed for counting number of syllables in a word as syllable count is a good cue (Bhatti & Mumtaz, 2016) for the identification of diphthongs.

In pilot testing, listening comprehension of the linguists has been checked prior for getting better results. Therefore, confusing words have been included in the test audio files. After taking the consensus, the actual experiment has been started. Diphthongs have been catered at initial, medial and final positions of words. Respondents have listened all utterances carefully by counting the number of syllables in each word. On the basis of their syllable count log-sheet, PakE shows idiosyncratic behavior of RP diphthongs. The initial results reported that there are four similar diphthongs (/aɪ/, /ɔɪ/, /aʊ/ and /eə/) but remaining four RP diphthongs have been articulated as monophthong (/e/, /o/), or triphthong (/ʊae/ which is not the part of RP diphthongs). The remaining word list shows syllabic alternation by showing segmental insertion therefore, not used further.

Table 1: The Checklist for Auditory Analysis

		Phonological Transcription	**No. of Syllables**	**Identification**	**Insertion**
1	Day, great	/eɪ/ → /e/	1	Monophthong	
2	Sure, January	/ʊə/ → /o/	1	Monophthong	
3	Close, know,	/əʊ/ → /o/	1	Monophthong	
4	Town, mountain	aʊ	1	Diphthong	
5	Guide, Died	/aɪ/	1	Diphthong	
6	Parents, wear	/eə/	1	Diphthong	
7	Hear, appear	/ɪə/ → /eə/	1	Diphthong	
8	Fire, tired	/aɪə/ → /aɪ/	1	Diphthong	
9	player, mayor	/eɪə/ → (eə)	1	Diphthong	
10	Voice, choice	/ɔɪ/	1	Diphthong	
	Boy, joy	/ɔɪ/ → /ɔe/	1	Diphthong	
		/ɔɪ/ → /ʊae/	1	Triphthong	
11	hour/our, power	/aʊə/ → (a.v.ə)	2		/v/ insertion
12	lower, widower	/əʊə/ → (ɔ.v.ə)	2		/v/ insertion
13	loyal, royal	/ɔɪə/ → (ɔjæ)	2		/j/ insertion

4.2. Acoustic Experiment Methodology

Afterwards, acoustic analysis has been done. The acoustic behavior of RP diphthongs reported that 8 diphthongs have been articulated differently in PakE. The spectral analysis shows that three RP diphthongs (/aʊ/, /aɪ/, /eə/) articulated similarly by Pakistani speakers but only at word medial position. But /ʊə/ and /əʊ/ diphthongs have been articulated as /o/ monophthong and the diphthong /eɪ/ has been altered with /e/ monophthongs. The /ɪə/ diphthong has been articulated as /eə/ and behaves as merger. The /ɔɪ/ diphthong shows a very strange behavior in

three different manners. As it has been similarly articulated as a diphthong at word medial position but it has been articulated as /ɔe/ or /ʊae/ at word final position.

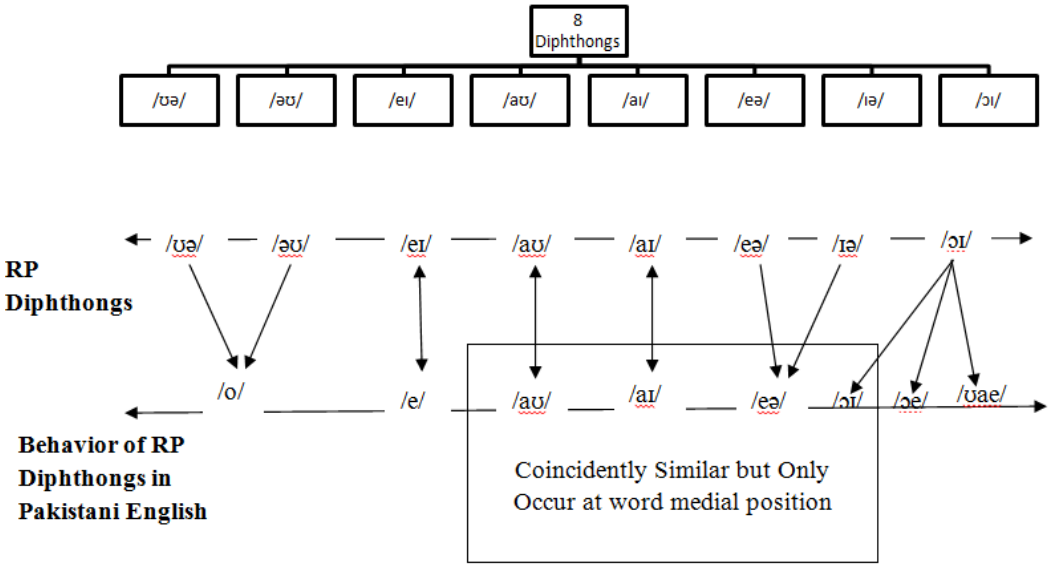

Figure 3: RP Diphthongs and their Acoustic Behavior in PakE

Segmental duration and formant frequencies have been analyzed both at stressed and unstressed conditions separately. Average values have been taken by enlisting their values among male and female Pakistani English speakers which have been enlisted in table. Moreover, minimum values have been observed in unstressed articulation while maximum values in stressed articulations. Firstly, vocalic segments have been selected or rejected on the bases of duration.

1. A monophthong is different from an ordinary vowel by the means of duration as it has more duration than an ordinary vowel (2.2.2.). This hypothesis also supports the segmental duration in the present study as well. For example, the average durational range for an unstressed vowel is between 100-120 milliseconds (ms) while a monophthong ranges from 150-170 ms. An average duration of a stressed vowel is 110-150 ms while a monophthong ranges from 200-220 ms.
2. All unstressed diphthongs have segmental duration around 300 milliseconds (or below) and stressed segments have 350 milliseconds (2.2.3.). This duration also supported in the past research for Pakistani Urdu diphthongs (Khurshid, Usman, & Javaid, 2003-2004) (Bhatti & Mumtaz, 2016).

3. Strangely, unstressed segmental duration of a triphthong have been observed equal to a diphthong i.e. around 300-350 milliseconds or below. According to literature review, in RP triphthongs, the middle vowel is confusing (2.2.4.) but contrary to this, in the PakE, first short vowel is confusing than both of the other vowels.

Table 2: Vocalic Sequences and their Duration in PakE

	Diphthongs	**Average of Unstressed Duration of Diphthongs (ms.)**		**Average of Stressed Duration of Diphthongs (ms.)**	
		Males	**Females**	**Males**	**Females**
1	eɪ → e	151	154	200	212
2	əʊ → o	139	170	164	210
3	aɪ	164	159	180	226
4	aʊ	162	159	240	220
5	eə	176	150	227	220
6	ɔɪ → /ɔe/	223	220	330	324
7	ɔɪ → /ʊae/[2]	245	263	287	292

Formant frequencies of identified vocalic segments (i.e. two monophthongs, four diphthongs and one triphthong) have been manually measured in PRAAT. Therefore, first formant (F1) and second formant (F2) have been measured while remaining formants (i.e. F3, F4, F5) have been ignored as they are not much supportive like first two formants. A diphthong has been divided into three parts i.e. on glide, transition period and off glide (2.2.3.). Presently, transition period has been used for the acoustic identification. Three instances of every vocalic segment (10 sentences x 8 vocalic segments x 3 repetitions x 30 speakers = 7200 utterances) have been measured and their average values have been reported in the following table.

[2] /ʊae/ is a suggested triphthong in Pakistani English variety.

Table 3: Vocalic Segments and their Formant Frequencies in PakE

	Vocalic segments	Average Formant Values of Males' Diphthongs (ms.)		Average Formant Values of Females' Diphthongs (ms.)	
		F1	F2	F1	F2
1	aɪ	680	1502	593	1739
2	aʊ	561	1098	713	1176
3	eə	546	1712	438	1864
4	ɔɪ → /ɔe/	753	1453	779	1700
5	ɔɪ → /ʊae/	624	1298	676	1298

Places and manners of articulation of four diphthongs and one triphthong of PakE have been displayed in the figure 5 by using the above given values.

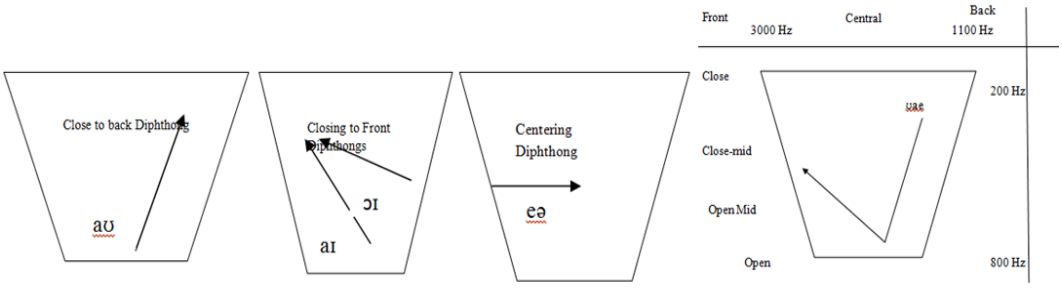

Figure 4: Places and Manners of Articulation of Vocalic Segments in Pakistani English

In Pakistan, Urdu is our national language but English also has been considered as an official language (2.1.). Obviously, English should our second language but fortunately or unfortunately it has been considered more than the native languages. Therefore, in this study, the speech of Pakistani English speakers has been acoustically analyzed in PRAAT software and results show that there are number of differences in native British English and Pakistani English variety.

1. Pakistani speakers have been articulated vocalic segment with segmental lengthening without creating vowel reduction. Therefore, 2 monophthongs have been articulated in place of diphthongs e.g. in articulating the word ‘great’ /e/ monophthong has been articulated by Pakistani speakers in place of /eɪ/ diphthong.

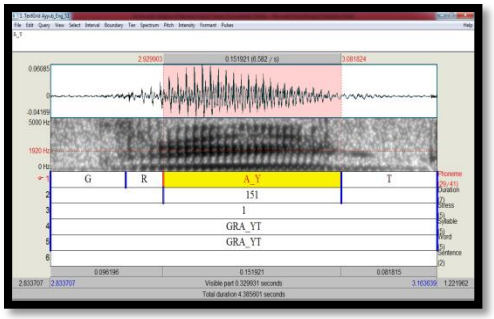

Figure 5: Monophthong in PakE

2. In the present study, only four diphthongs have been reported by using auditory method and also acoustically confirmed by the researcher.
3. But all these diphthongs have been identified at word medial and final positions only. The reasons might be; the nativeness effect of Urdu language and lexical stress.
4. Diphthongs are also replaced by the vocalic or consonantal segment by increasing number of syllables.
5. A triphthong /ʊae/ has been articulated by Pakistani speakers in the words; boy, toy, etc. But in the traditional English phonetic inventory, these words have been transcribed with a diphthong /ɔɪ/.
6. Due to extra metrical rule, short vowel /ɪ/ has been substituted with /e/ vowel at word final position as in the articulation of word July.
7. At word medial position /aɪ/ has been articulated by Pakistani English speakers. But word finally, it has been converted into /ai/ diphthong with long-long vowel combination. The reason might be its existence in Urdu inventory (Bhatti & Mumtaz, 2016) and extrametrical rule.

5. Conclusion

The present work has concluded the contrastive nature and acoustic differences in PakE. It has been concluded that native language, Urdu or Punjabi phonetically influences English speech of Pakistani L2 speakers. This influence effects the word syllabification, vowel duration and formant frequencies of the RP diphthongs. The spectral analysis confirms that four RP diphthongs (/aʊ/, /aɪ/, /eə/, /ɔɪ/) show similarly acoustic features in PakE but only at word medial level. But two diphthongs (i.e. /ʊə/ and /əʊ/) have been merged and articulated as /o/ monophthong. Similarly, /eɪ/ diphthong has been articulated as /e/ monophthongs. The /ɪə/

diphthong has been articulated as /eə/ and behaves as merger. The /ɔɪ/ diphthong may articulate in three different ways; (i) similarly articulated at word medial position but it has been articulated (ii) either as /ɔe/ diphthong or (iii) /ʊae/ triphthong at word final position. These results are based on the data collected from thirty speakers. PakE speakers have not been articulated short vowels at word final position due to the extra metrical rule and nativeness effect of Urdu language. Consequently, we can say that PakE would become an independent variety by the addition of these vocalic segments.

6. Future Work and Recommendations

PakE is acoustically different from the phonetic inventory of British English. The study will also prove helpful for Pakistani English language teachers and learners. But it is based on a limited speech and narrow number of speakers. Therefore, following steps would be considered in future for further confirmation by increasing number of speakers and speech corpus. This would enhance and establish the phonetic inventory of PakE. In future, accent variation would be analyzed. The phonological rules for acknowledging the causes of variations in PakE would be discussed in future work.

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Appendix

IPA Symbols and CISAMPA of Short and Long Vowels which have been used to mark diphthongs in PakE

	IPA	CISAMPA
1	uː	U_U
2	oː	O_O
3	ɔː	O
4	ɑː	A_A
5	iː	I_I

6	e:	A_Y
7	æ:	A_E
8	ɛ	A_E_H/A_Y_H[3]
9	ɪ	I
10	ʊ	U
11	ə	A

Table 1: CISAMPA for PakE

Table 2: Diphthongs in British English

Sr. #	**English Words**	**IPA**	**CISAMPA**
1	Day, afraid, great	eɪ	A_Y_I
2	Hair, parents, wear	eə	A_Y_A
3	Town, mountain, flower	aʊ	A_A_U
4	July, decide, buy	aɪ	A_A_I
5	Boy, voice, joy	ɔɪ	O_I
6	Sure, January	ʊə	U_A
7	Close, know, moment	əʊ	A_U
8	Hear, here, appear	ɪə	I_A

[3] 3 medial vowels (i.e. /e/, /æ/ and /o/) have been suggested by the Oxford Urdu-English Dictionary, 2012. These vowels are shorter in length than the long vowels but larger than the short vowels in duration. As they have no IPA symbol therefore same symbols have used for the long and medial vowels. Therefore colon mark (:) has been used with the long vowels in order to create difference.