LASBELA UNIVERSITY OF AGRICULTURE, WATER AND MARINE SCIENCES

BALOCHISTAN JOURNAL OF LINGUISTICS

Panel of Reviewers

Guidelines for Authors

Balochistan Journal of Linguistics is a journal published annually by the Department of English Language and Linguistics, Lasbela University, Uthal Balochistan. It accepts papers for consideration on any aspect of theoretical and applied linguistics. The authors are requested to send their papers according to the following guidelines
Sending papers for consideration for publication implies that the authors have accepted the terms and conditions/policy of the journal.

I. All manuscripts in English should follow the following format:

The first page should contain title; author(s)'s name(s), affiliation, E-mail address; and abstract of 150-350 words, followed by three to five key words, main text, acknowledgment, endnotes, and references in subsequent pages. Key words should be given in italics.

II. Manuscripts in English should use the following style for headings and subheadings:

1.
1.1
1.1.1
1.1.2
1.2
2

The main heading should be written bold in font size 14. All other headings should be written bold in font size 12. DONOT underline any headings at all.

III. Tables, figures, and maps should have headings and be numbered consecutively and should be clearly presented. Notes and sources should be placed under each table and figure. Photo will be treated as figures.

Format

Use Letter size paper with Times New Roman writing style font size 12 for the main text and 10 for the abstract with 1.15 line spacing for the whole document. Left margin should be 3.5 but all other margins should be 2.5 mm. Tables and figures should not be split on two pages.

Other requirements

Give one paragraph introduction of all authors in five to seven sentences (for each author) describing their educational background and research achievements in a separate file. But do not use hyperlinks. The authors are responsible for their material, so they should check plagiarism before sending their papers for consideration.

References

1) Use APA style of referencing.

Note on Authors

Zahid Ali Veesar got MA English Language and Literature from National University of Modern Languages, Islamabad. He is a lecturer in English at LUAMWS since April 2008. He taught English language, linguistics and literature there. These days he is doing PhD in LINGUISTICS at University Malaya, Kuala Lumpur, Malaysia. Syntax is his major area of research.

Illahi Bakhsh Gopang is a lecturer in the Department of English Language, Linguistics and Literature, Lasbela University of Agriculture, Water & Marine Sciences, Uthal. He did MA from Sindh University Jamshoro. Currently he does M.Phil in Linguistics from Sindh University Jamshoro.

Rimi Saleh Bagudu is a graduate of language Arts Education from University of Jos, Nigeria. He is appointed as a Graduate Assistant at the Bauchi state University, Gadau, Nigeria. Currently he is pursuing M.A linguistics at University of Malaya, Malaysia.

Khursheed Ahmad is holding master degree in English language and Literature from university of Peshawar and MPhil in Applied Linguistics from the Islamia University of Bahawalpur. These days, he is working on his PhD dissertation in the area of L 2 acquisition. His research interests include Applied Linguistics, Socio-linguistics and Discourse analysis. He has already got two publications in the area of Applied Linguistics and Discourse analysis.

Dr. Rajkumar Malik did his PhD in Hindi literature from Delhi University, New Delhi. He is a writer and researcher of Hindi and Saraiki. He has written on Saraiki and Hindi. He has presented and published a large number of papers in various universities of India.

Syed, Nasir Abbas is Associate Professor of Linguistics at the Department of English Language and Linguistics, Lasbela University, Uthal Balochistan. He did MA in theoretical phonology and PhD in Acquisition of Second Language Phonology from University of Essex, United Kingdom. He has presented papers in national and international conferences in England, France, Germany, Italy, Hungary & Turkey. His area of interest include phonology, socio-phonetics, historical linguistics and applied linguistics with special focus on Pakistani languages. He has published a number of papers in Pakistan, India, England, Italy and Hungary.

Dr Gul Hasan is Pro Vice Chancellor of Lasbela University of Agriculture, Water & Marine Sciences, Uthal. He is a writer and researcher of Balochi, Persian and Russian. He has presented and published a large number of papers in various universities of Pakistan.

CONTENTS

Factors triggering language attrition

Nasir Abbas Syed (nasirabbassla@gmail.com)
Dr Rajkumar Malik (rajkumar@sify.com)
Dr Gul Hasan (russlanguage2002@yahoo.com)

The current paper presents a case of language attrition in Delhi. In 1947, many Saraiki speaking families moved to India from Pakistan. The current study analyzes some of the phonemes of L1 consonant inventory of the Saraiki speakers of Delhi. 118 participants of both male and female gender participated in this study. Half of them were Pakistan-born migrants and the remaining half were Delhi-born progeny of the migrants. In a production task, the participants of were asked to produce a set stimuli carrying the target sounds i.e. [ɳ ɲ ŋ n^h l^h $ɳ^h$] in word medial and final position. The productions were recorded and the recordings were evaluated by four native speakers of northern Saraiki from Pakistan on a Likert scale. The results show that the participants who were born in Saraiki speaking monolingual environment of Pakistan, were slow in convergence than their sons and daughters who were born in a bilingual environment of Delhi. A strong role of function load and dominant language (Hindi) but a minor effect of markedness, gender and attitude was identified in attrition of L1 of the participants.

Key words: Attrition, bilingualism, breathy voiced, markedness

1. Introduction

The British East India Company managed to occupy the Subcontinent of India and Pakistan in 1857. For the next 90 years, the Subcontinent remained under the British control as its colony. In 1947, the Subcontinent got freedom and two independent states of Pakistan and India appeared on the map of the world. Since Subcontinent was divided on the basis of religion, therefore, at the time of independence, there was a large scale transfer of population to and from Pakistan. Lots of Saraiki speaking Hindu families moved from Pakistan to India in 1947 and Urdu and Punjabi speaking Muslims came to Pakistan from India. Thus, Saraiki reached Delhi as a minority language. The Saraiki speaking migrants and their sons and daughters slowly started converging from Saraiki to the dominant language Hindi. Consequently, Saraiki is an attriting language in some families of Delhi these days. This paper studies direction of language loss among the

Saraiki speaking community of Delhi. It is important to point out that the terms like attrition, loss, convergence and obsolescence will be used as synonymous in this paper although experts have pointed out subtle differences between these terms (Schmid, 2013). This paper attempts to study direction of the language loss with a focus on plain nasals [ɲ ɳ ŋ] and breathy voiced sonorants [nʰ lʰ ɲʰ ɳʰ] of Saraiki. The plan nasals [ɲ ɳ ŋ] also exist in the phonemic inventory of speakers of Hindi (Shapiro, 2007). In the words of Iverson and Salmons (2008) Hindi is a stop-rich but fricative-poor language. Therefore, substitution of stops with fricatives is also common in Hindi (Hock, 1991). Similarly, Saraiki is also a stop rich language (Syed, 2013). The retroflex nasal [ɳ] has special status in both Saraiki and Hindi in that it occurs very frequently in both languages. A close observation shows that both Saraiki and Hindi have many commonalities though they have some complementarities also. An example of complementarity is that alveo-palatal and velar nasal consonants occur in a restricted environment in Hindi whereas in Saraiki, these nasal consonants occur normally and freely. In the words of Shapiro (2007, p. 256) [ɲ ŋ] occur in Hindi in a specific environment when a nasal is followed by a stop. Thus, the occurrence of these two nasal consonants in Hindi is restricted as well as predictable. But in Saraiki, [ɲ ŋ] consonants occur freely on word-final and word-medial position. The current study focuses on [ɲ ŋ] and breathy voiced sonorants [nʰ lʰ ɲʰ ɳʰ].

In attrition of a dominated language, role of the factors like markedness (Seliger, 1996) and dominant languages (Ecke, 2004) has already been identified. Primarily, the current study tries to tease apart the effect of these two factors. A study of contribution of the following factors in L1 attrition is also a major aim of this study;

a. gender,
b. L2 learning environment,
c. frequency of speaking L1 and
d. functional load of a phoneme

As mentioned before, retroflex nasal is more frequently used than velar and alveo-palatal nasal in Hindi and Saraiki. According to the universal markedness scale, coronal sounds are less marked than velar sounds (de Lacy, 2007). But on account of complexity, a retroflex nasal is more marked than alveo-palatal (non-retroflex coronal) nasal. If language loss is exclusively triggered by only universal markedness, the velar nasal of Saraiki should be lost prior to the coronal nasals, and in the coronal nasals, retroflex nasal on account of being more complex, is expected to attrite before the alveo-palatal nasal. But if only a dominant language is the cause of language loss, the Saraiki speakers should be equally faithful to all three plain nasals but lose breathy voiced sounds because the target nasal consonants exist in the dominant language i.e. Hindi but breathy voiced consonants [nʰ lʰ ɲʰ ɳʰ] do not exist in it; And if the effect of frequency of occurrence

(functional load) in L2 also contributes to language loss, the alveo-palatal and velar nasals on account of being less frequently occurring phonemes, should disappear before retroflex nasal (a frequently occurring phoneme) from the phonemic inventory of the Saraiki speakers of Delhi. To test these hypotheses is a major objective of this study.

2. Literature Review

In this section, we shall discuss some factors which influence language attrition. Both linguistic and non-linguistic factors which have been found to play a role in language loss are briefly described in the following sub-section.

2.1. L1 Exposure and frequency of use

At the surface, it seems logical to think that frequency of use may have a direct link with language loss. If a language is spoken more frequently it will be lost later than a language which is spoken less frequently. However, the opinion of linguists is divided about the role of frequency of use in language attrition. The findings of some studies could not establish any link between frequency of use and language loss (Opitz, 2011; Varga, 2012, etc.) but some linguists give lot of importance to frequency of use and recency on language attrition. For example, Activation threshold theory lays stress on the frequency of use and recency of words in language loss (Paradis, 1993). Schmid (2007) and Schmid and Dusseldorp (2010) found some relationship between use of the attriting language in a professional setting and its attrition. In the opinion of Schmid (2013), frequency of speech may have negative impact in a vicious circle where speakers feel less confident in their own proficiency and start converging towards an L2 in a specific setting where the L2 is dominant.

Besides we have to keep in mind the difference between frequency of use and frequency of occurrence (functional load). Some sounds occur in a language more frequently than other sounds. For example, retroflex nasal is a most frequently used consonant in Hindi and Saraiki. On the other hand, velar and alveo-palatal nasal are relatively less frequently used consonants in Hindi. We need to keep these factors in front of us while deciding about frequency of use of a language.

2.2. Markedness

Markedness is a term which is much used but less understood in the world of linguistics. There is not much agreement among linguists about the real nature of markedness. The term markedness dates back to the linguists of Prague school namely Trubatzkoy and Roman Jacobson. One view about markedness is that the more complex sound is relatively more marked (de Lacy, 2007). Let us remember that markedness is relative. As an example, retroflex sounds are produced with more complex articulatory gestures than non-retroflex ones. Thus, other things being equal, a retroflex sound will be more marked

than a non-retroflex one. Another point of view is that if consonants are classified on the basis of major places of articulation, normally coronal sounds are least marked and the dorsal sounds are most marked with labial ones in between (de Lacy, 2007).

Another criterion to determine markedness is frequency of occurrence of sounds in the world languages. A commonly accepted view is that more frequently occurring sounds are less marked and vice versa. There is also an implicational scale of markedness according to which if the presence of a sound X implies that of the sound Y but not vice versa, then Y is more unmarked than X (Archibald, 1998). This may be illustrated with examples from phonemic inventories of the world languages. Oral plosives exist in all languages of the world but nasals are not necessarily part of the phonemic inventory of all languages of the world (Ladefoged & Maddieson, 1996). There are languages which have only oral stops and there are languages which have both oral and nasal stops. But there are no known languages which have only nasal stops without having oral stops. Thus, the presence of nasal stops implies that of
oral stops but not vice versa. Therefore, oral stops are more unmarked than nasal stops.
Another important way to determine markedness is direction of acquisition of sounds in L1. Normally, the unmarked or less marked sounds are acquired before the marked ones. Similar pattern is followed in L2 acquisition (Eckman, 1991). It is also claimed that the reverse is the direction of loss of consonants in language attrition. The claim that language loss is a mirror image of language acquisition implies that in language loss, the more marked sounds are lost before the less marked ones (Hansen & Chen, 2001). One of the objectives of this study is to test this claim in the current context.

One important thing related to this is that the direction of language acquisition and frequency of occurrence in the world languages may be different for explosives and implosives. Thus, for different classes of sounds (like nasals or implosives) markedness hierarchy may also be different from that observed in oral explosive sounds. For example, from viewpoint of language acquisition (Cissé, Demolin, & Vallée, 2011), articulation (Clements, 2002) and frequency of occurrence (Ladefoged & Maddieson, 1996; Maddieson, 1984), bilabial implosives are found to be the less marked than coronal implosives but for explosives it is claimed that coronal sounds are more unmarked than labial ones (de Lacy, 2007).

2.3. Dominant language

One of the major causes of attrition is that the speakers cannot inhibit the L2 in an environment where the L2 is dominant (Schmid, 2013). Because in the words of Opitz (2011, p.20) "In cases other than language pathology, we do not expect an established L1 to deteriorate or diverge from the grammar that has been fully acquired....There is some scientific support for the ‘immutable proficiency’ view: Some psycholinguists have

proposed a 'threshold of frequency of use' and/or proficiency level beyond which knowledge becomes immune to loss". Many linguists second this view (de Bot, 1998). The matter of fact is that bilingualism leads to reduced accessibility of linguistic knowledge. A dominant language does not allow the speaker to access to the data which is placed low in the memory and as a result, the speaker produces the corresponding linguistic material which is lying in the upper layers of memory. This is the reason that most frequent, recent and dominant linguistic material slowly takes place of less frequent dominated linguistic material.

In the current context, the target population speaks a minority language. Hindi is a dominant language. If due to certain reasons, the Delhiite speakers of Saraiki have to shift to another language, Hindi is the most favourite option because socially and economically it is the most effective language. Some linguists are of the view that "In cases other than language pathology, we do not expect an established L1 to deteriorate or diverge from the grammar that has been fully acquired" (Opitz, 2011, p. 20). When someone loses a language, actually s/he replaces it with another language. Thus, language loss is only possible when there is another language available to the loser (Herdina & Jessner, 2002, p. 95; Seliger, 1996, p. 616). Therefore, a dominant language may be most effective trigger of L1 loss.

2.4. Non-linguistic factors

According to Schmid (2013), there is not much research on relationship between attitude and language attrition. She assumes that the attriters with positive attitude towards their L1 may undergo less attrition than those who have negative attitude towards their L1. Very few studies have established a correspondence between attitude and language attrition (e.g. Schmid, 2011) while some studies did not find any correlation between language attitude and attrition (Cherciov, 2011). Schmid (2012) reports some contexts in which the holocaust stricken attriters do not want to remember or speak their L1. Such detachment definitely contributes towards L1 attrition. In the current context, the migrants of both sides, those migrating to and from Pakistan, underwent horribly traumatic experiences at the time of division of the Subcontinent in 1947. Thus, the horrible memories of the dismal experiences may also motivate speakers of Saraiki in Delhi to detach themselves from Saraiki. On the other hands, Schmid (ibid) also talks about a possibility that some traumatic memories affiliated to the holocaust survivors may also pre-occupy their minds to remain there forever. In the study of language attrition, these linguistic and extra-linguistic issues may be revoked as important factors.

3. Research Methodology

The methodology used for data collection and analysis is detailed in this section. First the detail of the participants is given. Later on, the tools of data collection are explained.

3.1. Participants

Two groups of participants, one consisting of 57 and other of 61 native speakers of Saraiki, were selected from Delhi for this study. In one groups were those participants

Table 1: Detail of participants

	Group	Minimum	Maximum	Mean	Std. Deviation
Age (years)	Immigrant	66.00	87.00	75.25	6.26
	1st Generation	27.00	64.00	52.53	8.90
Speaking Saraiki (hours/day)	Immigrant	.50	10.00	02.97	2.92
	1st Generation	.50	10.00	02.53	2.76

who were born before the division of the Subcontinent into Pakistan and India in 1947 in the areas which are now part of Pakistan. These participants moved to India in 1947. The second group comprised of progeny of the migrants. In this study, they are called first generation of Delhi-born Saraiki speakers. The number of male and female participants was nearly equal in both groups. The average age of the Delhi-born first generation of Saraiki speakers was 52.53 years. The participants of this group were selected with a view that these participants were born only 13 years after their parents had arrived into India in 1947.[1] The participants of this group confirmed that their parents were speaking Saraiki when the former were born. In other words, both the migrants and the Delhi-born first generation L1 in a natural environment. The only difference is that the migrants were born in a monolingual Saraiki speaking area (now in Pakistan) while the Delhi-born participants were born in a multilingual environment where Hindi is a dominant language. The detail of the participants is given in Table 1.

Table 1shows that the migrant participants were 75.25 years of average age and the Delhi-born first generation of participants were of 52.53 years of average age at the time of data collection.

According to their own statements, the migrant group speak Saraiki for 2.97 hours daily and the 1st generation group speak Saraiki for an average of 2.53 hours daily. Table 2 shows the number of male and female participants in both groups.

[1] The data were collected in 2012.

Table 2: Gender-based detail of participants

Grouping		Gender		Total
		Male	Female	
Group	Migrant	30	27	57
	1 Generation	30	31	61
Total		60	58	118

Table 2 shows that the number of male and female participants is very similar in both groups. These information were elicited in an interview which was recorded. The detail of the data collection and analysis is given in the following sub-section.

3.2. Tools of research

Interview and word- production task were used as main tools for data collection in this study. The background information provided in the previous sub-section was taken from the participants in a semi-structured interview. The second author of this paper conducted the interview in Saraiki with the participants at different places of convenience for the participants. In the interview, questions about age and educational & linguistic background of the participants were asked. The interview was recorded which was later on transcribed by the first author. Both first and second author are native speakers of Saraiki.

Afterwards, the stimuli (words of Saraiki carrying the target sounds)[2] were presented to the participants orally one by one by the second author and the participants were asked to produce the same words in the best pronunciation of their L1(Saraiki). The productions were recorded. There was a long list of stimuli which were produced by the participants including the target sounds. It is ideal to use such words as stimuli which have target sounds on word-initial position because onset is considered relatively more unmarked as easier compared with coda position (Archibald, 1998). However, the target sounds of this study do not occur word-initially or syllable initially. Thus the words with the target sounds on word-medial and final position were selected as stimuli for evaluation of the target sounds, the recordings of productions were presented to four native speakers of Saraiki. In some of the cases there were repetitions of the stimuli. Among the repetitions, the best productions were selected by the first author for evaluation. The evaluators were asked to evaluate only the target sounds in the words on

[2] See the list of stimuli in appendix.

the following criterion, neglecting the pronunciations of the participants of the other sounds in the stimuli. The evaluators were asked to strictly take care that their judgements are not biased by the (in)correct pronunciations of the sounds other than the target sounds in the stimuli. Thus the evaluators marked the target consonants only without getting influenced by the overall productions of the participants. The evaluators speak northern Saraiki. The migrant participants of this study were living in the areas before migration where northern Saraiki is spoken. The evaluators were asked to judge the target sounds considering their own pronunciation as a standard. The judges were asked to evaluate the sounds using a Likert scale given in Table 3.

Table 3: Likert scale used for evaluation

Score	Definition
5	Native-like
4	Near-native-like
3	Different from natives but understandable
2	Hard to understand
1	Unintelligible

The opinions of the judges were different in productions. Four opinions for each of the productions were averaged for further analysis. The reliability of evaluation was determined by applying a Cronbach's alpha test on the evaluation scores awarded by the judges. The results of the reliability test are given in Table 4.

Table 4: Reliability of the evaluation

Sounds	Cronbach's alpha	Reliability (%)
[ɳʰ]	0.785	79
[lʰ]	0.607	61
[nʰ]	0.769	77
[ɲ]	0.787	79
[ŋ]	0.765	77

As Table 4 shows, in all but one cases, the reliability coefficient is above 0.7. A reliability coefficient of 0.7 is considered ideal in such
evaluation since it indicates 70% agreement among judges (Larson-Hall, 2010). Column three in the table shows percentage of agreement among the opinions of the judges. Overall high percentage of agreement among judges in most of the sounds, confirms reliability of the data. In the following section only averaged results are presented for further discussion and analysis.

4. Presentation and analysis of data

The results are presented in this section. First overall results will be presented. Later on, the results based on various research questions will be presented in the following paragraphs..

Table 5: Overall results

Sound	Minimum	Maximum	Mean	Std. Deviation
[ɳʰ]	1.00	5.00	1.78	1.05
[lʰ]	1.00	4.50	1.81	0.88
[nʰ]	1.00	5.00	2.01	1.18
[ɲ]	1.00	5.00	2.52	1.33
[ŋ]	1.00	5.00	3.48	1.19
[ɳ]	1.00	5.00	3.92	1.30

The results in Table 5 show that the participants performed better on retroflex nasal worse on breathy voiced sounds. The overall difference between the mean scores of consonants is significant (F=.518, p<.0001) . However, separate analysis reveals that the difference among three breathy voiced nasals is non-signficiant (F=2.237, p=.110). But, the difference between pairs of plain nasals is significant as Table 6 shows;

Table 6: Pair-wise comparisons

S. No.	Sound Pair	t	sig (2-tailed)
1.	[ŋ]- [ɲ]	8.168	.000
2.	[ɲ]- [ɳ]	-10.083	.000
3.	[ɳ]- [ŋ]	3.667	.000

According to the scale used for evaluation, a score of '1' was awarded for a thoroughly inaccurate production. In other words, a score of '1' indicates total loss of the L1 sound. A score of '2' stands for 'different from natives but understandable'. The results show that the breathy voiced were awarded a score between 1 and 2 which means these sounds are *almost* extinct from the phonemic inventory of the participants. Among plan nasals, the participants have scored the highest in retroflex [ɳ] and the lowest in alveo-palatal [ɲ]. A score of 4 indicates near native-like production. The average production of the participants is 3.92 for retroflex [ɳ] which indicates that the participants are closer to the near-native level in production of the retroflex nasal. Figure 1 reflects cumulative results.

Figure 1: Overall results

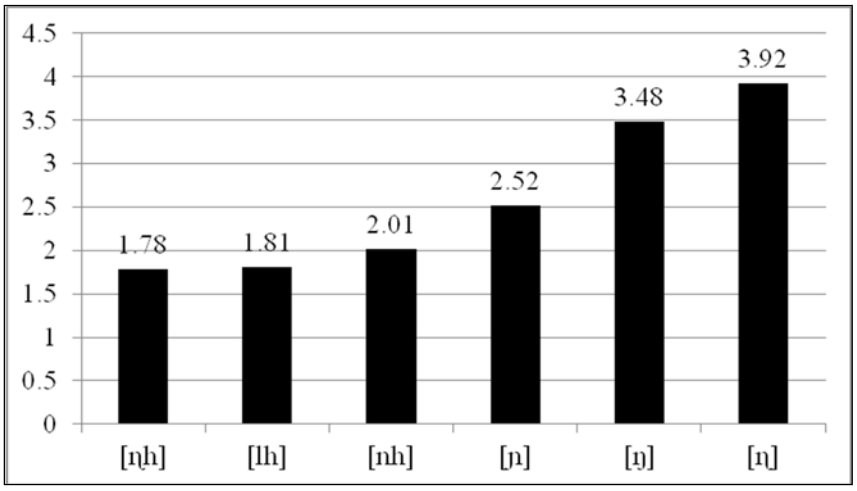


Figure 1 reveals that overall, only two sounds could obtain a score between 3 and 4 and none of the sounds could obtain more than 4. A score of 4 was awarded to a 'near native-like' production and 3 was awarded to a production which was rated as 'different from natives but understandable'. Figure 1 confirms that all target sounds are losing. However,

they are not attriting from the phonemic inventory of the participants simultaneously at the same speed. There is a directionality of loss. The sounds which are common in Hindi and Saraiki namely retroflex, alveo-palatal and velar nasal are among those which are attriting slowly as compared to the breathy voiced consonants which are almost extinct from the phonemic inventory of the participants.

Figure 1 presented an overall picture of direction of language loss among the Delhiite Saraiki speakers. For a detailed analysis, we counted the frequencies of the participants lying in different categories. Let us recall that the evaluation was based on a five point Likert scale given in Table 3 above. For further clarity, we summed up the number of participants who got 1-2 scores for the target sounds and those who got 3-4 scores together. On the scale used for evaluation, 1 denotes absolute loss and 2 means 'hard to understand' as the target sound. This is a category which is lower than 3 which is defined as 'different from natives but understandable'. We assume that, those participants who got 1-2 scores have almost lost the specific target sound from their L1 phonemic inventory. Similarly, 3 denotes 'different from natives but understandable' and 4 denotes 'near native-like' which also means different from natives. Thus, the candidates who obtained 3-4 scores show that they are on the way to lose their L1 sounds but they have not yet thoroughly lost the specific sound. And those who have obtained 5 points in the evaluation are those who have retained the target sounds. The summary of the participants according to this classification is given in Table 7. The numbers have been converted into percentage for having an accurate comparative view.

Table 7: Participants (%) who have lost/retained/or are losing the target consonants

Consonant	Lost	Losing	Retained
[ɳ͡ʰ]	78.26	20	1.74
[l^{h}]	70.34	28.81	0.85
[n^{h}]	68.93	27.18	3.88
[ɲ]	50.43	38.46	11.11
[ŋ]	19.66	64.96	15.38
[ɳ]	15.38	39.32	45.3

Table 7 shows that more than 45% of the participants have retained Saraiki [ɳ] with native-like accuracy and 15.38% of them have [ŋ] with native-like accuracy. Only 11.11% of the participants have retained alveo-palatal nasal in their L1 phonemic inventory. The remaining sounds have either been lost or are likely to disappear from the phonemic inventory of the participants very soon.

In the following sub-sections we analyze the whole data keeping view the research questions.

4.1. Role of the dominant language

As the results show, the participants have native-like pronunciation in production of retroflex nasal of Saraiki. Overall their performance is better in plan nasals than in breathy voiced sounds. Breathy voiced sounds do not exist in the phonemic inventory of Hindi. Thus, the poor performance of the participants on breathy voiced sounds and their better performance on plan nasals which do exist in Hindi confirm that Hindi has a very effective role in the loss of Saraiki consonants from the phonemic inventory of Saraiki speakers of Delhi. Besides, retroflex nasal which occurs in Hindi words frequently, is retained by the participants in almost native-like manner. But those sounds which, though exist in Hindi, do not occur so frequently, have also been lost in the phonemic inventory of most of the participants. This further confirms the role of Hindi in the loss of consonants of Saraiki from the L1 phonemic inventory of the speakers.

A possible question to these findings is why the participants are losing plan nasal consonants which exist in Hindi if the process of language is triggered by Hindi? The possible answer is that two of the plan nasal consonants namely alveo-palatal and velar nasal consonants do not occur in Hindi freely. Rather they occur in Hindi in a very limited context (Shapiro, 2007). Therefore, the participants are also losing these two consonants although the speed of loss is not that much fast as in case of breathy voiced sounds which the participants have already lost.

The results obtained in production of retroflex nasal need special consideration. The retroflex nasal consonant exists in Saraiki and Hindi and occurs in both languages so frequently. There is no apparent reason for loss of this consonant. But overall score of the participants in production of this sound is less than 4 (see Table 5). To our understanding, this is due to methodological issues. The participants are living in Delhi and are under strong influence of Hindi. The judges were from Pakistan and they judged the productions of the participants considering their own pronunciation as a standard. The apparently poor performance of the participants in production of retroflex nasal is perhaps because of the yardstick of pronunciation in used by the evaluators. It is quite possible that though phonologically the nasal retroflex in Delhiite Saraiki and the L1 of the judges are the same but phonetically they may be different from each other. The participants may produce Indian variety of retroflex nasal and the judges may be using the Pakistani pronunciation of retroflex nasal as a yardstick for evaluation. This needs further investigation. However, it is hypothesized that the participants are not losing retroflex nasal. Only their retroflex nasal has developed in acoustically different shape

from that of Saraiki retroflex nasal spoken in Pakistan. It may be considered a kind of dialectal variation.

These results confirm the influence of Hindi (a dominant language) in loss of Saraiki (a dominated language). From markedness point of view, retroflex is more complex than alveo-palatal nasal. If markedness were a stronger factor in language loss, then the participants would lose retroflex sounds before alveo-palatal nasal. But the results show the converse which is a consequence of the influence of Hindi language. It confirms that the role of a dominant language is stronger than that of markedness in language loss. However, if we compare the results obtained in velar and alveo-palatal nasal, the participants have produced velar nasal with relatively better pronunciation. According to the markedness scale, coronal sounds are more unmarked than dorsal ones. From that point of view, a velar sound should disappear before a coronal sound in the process of language attrition. But the results in Table 5 show that the participants are going to lose alveo-palatal nasal before the velar nasal. This puts a question mark on the view that marked sounds are lost before the unmarked ones. One possible reason may be the fact that markedness scale varies for oral and nasal sounds as it does for implosive and explosive sounds. This issue also needs further investigation.

The attriters may be slow in naming low frequency words which Schmid (2013) ascribes to the system load on bilinguals and not particularly to language attrition. The way the participants of this study produced the words and the direction of loss shows a drift of phonetic categories of the target sounds of Saraiki in the L1 phonemic inventory of the participants towards the corresponding Hindi sounds. In other words, the Saraiki vocabulary exists in the minds of the Saraiki speakers of Delhi but they have lost only the relevant phonemes from their phonemic inventory. This indicates that language loss is not a simultaneous process. It rather occurs in stages. One specific aspect of the attriting language may attrite earlier than another.

In the following sub-sections we shall analyze and discuss the results with reference to some other research questions.

4.1. Role of Gender in language loss

Table 8 shows the scores obtained by male and female participants separately in production of the target sounds.

Table 8: Gender-based results

Sounds	Male	Female
[ɳʰ]	1.75 (1.09)	1.66 (0.81)
[lʰ]	1.97 (0.92)	1.81 (1.02)
[nʰ]	2.04 (1.10)	1.98 (1.26)
[ɲ]	2.53 (1.21)	2.52 (1.45)
[ŋ]	3.57 (1.06)	3.39 (1.31)
[ɳ]	**4.28 (1.13)**	**3.56 (1.36)**

A parametric test confirms that the role of gender is non-significant ($p>.1$) in production of all except retroflex nasal sounds (highlighted in bold) which was produced significantly more native-like by male than female participants ($t=2.353$, $p=.020$). A careful look at the results given in Table 8 shows that in production of all these sounds, the male speakers have obtained better scores than female participants. (Although the difference is statistically non-significant in all but one cases). It means the female participants are losing these sounds before their male counterparts. However, the scores of the male participants for all, (except one i.e. retroflex nasal), these sounds are also below 4 which means they are also losing these sounds but their female counterparts are faster in convergence. Only in production of retroflex nasal the male participants have acquired more than 4 score which shows that they are between *native* and *near native* stage in production of this sound. The reason for this is already discussed in the previous section.

According to Schmid (p.c.), it is very difficult to tease apart the effect of gender and sex in a society. Therefore, there are not many studies on the role of gender and language

loss. This issue also needs further research. The current results do not determine a clear cut effect of gender on language loss. One interpretation of these results is that the female Saraiki speakers of Delhi are more prone to produce Saraiki retroflex nasal like Hindi retroflex. This is because females are normally more innovative than males. Therefore, they may be quicker than their male counterparts to adopt Hindi language. Another reason for this is that females have to grow up their children and teach them the L1. The Delhiite Saraiki speakers realize that it is need of time that their sons and daughters acquire Hindi as L1. Therefore, their females are more interested than the male counterparts to adopt Hindi. However, we conclude this with caution because these data are too small for us to reach a big generalization regarding the role of gender on language loss.

4.2. Effect of linguistic environment on language loss

As discussed in section 3, there were two groups of participants in this study. One group comprised of the migrants and the other of their sons and daughters. Table 9 provides mean scores of the two groups separately.

Table 9: Generation-based results

Sounds	Migrant	Delhi-born
[ɳ^{h}]	**1.76 (1.01)**	**1.57 (0.76)**
[l^{h}]	**2.08 (0.92)**	**1.78 (1.11)**
[n^{h}]	**2.31(1.22)**	**1.80 (1.09)**
[ɲ]	2.76 (1.26)	2.30 (1.36)
[ŋ]	3.63 (1.69)	3.34 (1.20)
[ɳ]	**4.06 (1.30)**	**3.80 (1.29)**

The difference of scores between the two groups is strongly significant (F=4.771, p=.031) for the breathy voiced nasals. The interaction between the breathy voiced consonants and grouping is also significant (F=3.613, p=.029). The group difference is also significant (t=2.093, p=.039) for retroflex nasals. (The mean scores which are significantly different

are highlighted bold). For the other two nasal sounds namely alveo-palatal and velar nasals [ɲ ŋ], the difference is non-significant (p>.1). The interactions are also non-significant. These results confirm that the pronunciation of the migrants is better than their sons and daughters for breathy voiced and retroflex nasal sounds.

The above table shows that in all these sounds the scores of the migrants are higher than their sons and daughters. It means those participants who were born in the monolingual Saraiki speaking environment in Pakistan, have retained their L1 sounds longer than their sons and daughters who were born in bilingual environment of Delhi where Saraiki is a minority language. However, except for retroflex nasal, in all other sounds, the scores of the migrants is also less than 4. This confirms that the migrants, though slower in losing their L1 than their sons and daughters, are also losing Saraiki sounds.

4.3. Attitude and language loss

In the interview, the participants were asked which languages they can speak. In response to this question, they enumerated in a sequence the languages they know. All participants knew Hindi and Saraiki. With the exception of only four, all of them also knew English. For determining the affiliation of the participants to these three languages (i.e. Hindi, English & Saraiki) a score of '0' to '3' was awarded to each language. The first language that they mentioned in the sequence was given 3 marks, second one was given 2 marks and the third one was given 1 mark. If they did not mention either of Hindi, English and Saraiki, in that case zero mark was awarded. In most of the cases they did not mention that they know Saraiki. Table 10 shows the mean values.

Table 10: Affiliation of the participants with Saraiki, English and Hindi

Language	Minimum	Maximum	Mean	Std. Deviation
English	.00	3.00	1.61	1.00
Hindi	.00	3.00	2.54	0.71
Saraiki	.00	3.00	0.96	1.08

The difference between the mean values is strongly significant (F=53.779, p<.0001). The attitude of the of migrant and Delhi born participants towards these three languages was not significantly different from each other (p>.1). Figure 2 shows the attitude of all participants towards the three languages which they speak.

Figure 2: Affiliation of the participants with English, Saraiki & Hindi

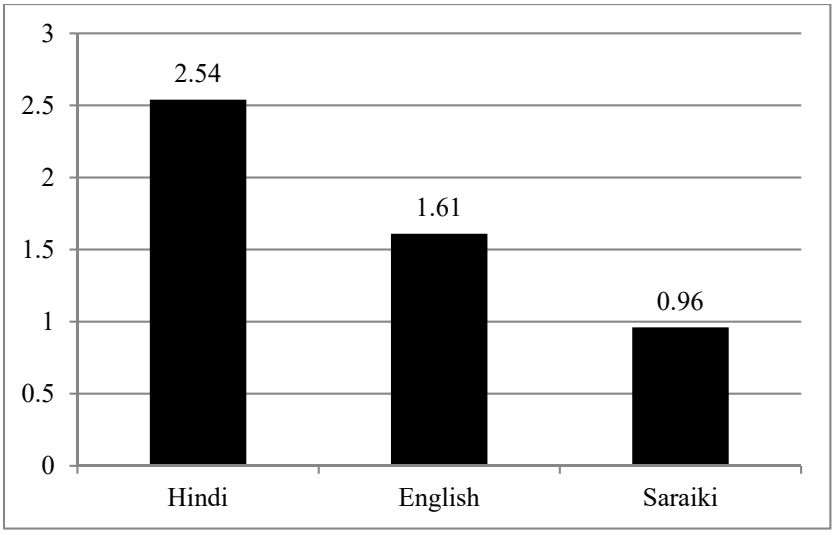


Figure 2 and Table 10 both reflect that the participants have the strongest affiliation with Hindi and the weakest affiliation with Saraiki. In response to the question, how many languages they know, they either did not enumerate Saraiki among the languages they knew or they enumerated it at the end. On the other hand, in most of the cases, they enumerated Hindi first of all. This shows their affiliation to these languages. Since the participants feel more affiliation with Hindi than with Saraiki, they prefer to shift from Saraiki to Hindi.

4.4. Frequency of use and language loss

As discussed in section 2, some of the studies claim that frequency of use has direct positive effect on language retention while others claim that there is no correlation between language loss and frequency of use of the moribund language. To determine a relationship between frequency of use and language loss, a correlation test was applied on number of hours the participants speak Saraiki and their accuracy in pronunciation. The results show that there was no correlation between frequency of use and pronunciation of the participants of all sounds.

A correlation test was again applied on the scores of migrants only, with a view that they had acquired Saraiki in a monolingual setting so there is a probability of correlation between the number of hours they speak Saraiki and the language loss. The results show that there is medium to small size positive correlation between frequency of use and two of the target sounds. The results of the correlation test are given in Table 11.

Table 11: Frequency of use and language loss

S. No.	Sound	Spearman's rho	Sig. (two-tailed)
1	[ɳ]	.311	.021
2	[ŋ]	.308	.022

Again these results do not provide us a strong footing to develop a big generalization about the relationship between frequency of use of the moribund language and its loss. However, the results in Table 11 confirm there is some relation between language use and language loss. One of the main reasons that a strong relationship between the two factors could not be established is that the participants of this study speak Saraiki among themselves. They all are gradually losing their mother tongue. In other words, they are listening to incorrect Saraiki. (At least from the view point of the standard used for evaluation, their Saraiki is not correct). Therefore, frequency of use in such a context may not incur any strong benefit to the users.

5. Summary of findings

The current study was based on an experiment conducted with Delhi-based Saraiki speakers. The results show that there was no significant ($p>.1$) correlation between number of hours the participants speak Saraiki and their accuracy in pronunciation of the Saraiki in most of the sounds. This supports the view that the L1 spoken in the L2 environment does not accrue any benefit to the L1 speakers (Schmid, 2012). The results also confirm that contribution of a dominant language rather than universal markedness, is more effective in attrition of a moribund language. The findings also indicate that more frequent occurrence (i.e. functional load) of the target sounds in the L1 and L2 is also an effective resistant to language obsolescence. Although retroflex nasal is more complex, the performance of the participants is better in production of retroflex nasal than dorsal nasal. Since the performance of the participants is better in the dorsal nasal (a non-coronal nasal) than alveo-palatal nasal (a coronal sound), the better performance of the participants in production of retroflex nasal may not be ascribed to the universal un-markedness of coronals. Actually, the participants performed better in retroflex nasal because retroflex nasal occurs more frequently than velar nasal in Saraiki and Hindi. This supports the idea that a high functional load also resists L1 attrition (Babel, 2008). Another important finding of this study is that the participants who are born in monolingual environment are slow to lose their L1 as compared to those participants who are born in bilingual environment. The findings also indicate that affiliation or detachment with a specific L1 or L2 may also affect L1 attrition. The role of gender in

language loss cannot be thoroughly determined in this study which may be a future research project.

Appendix: List of Stimuli

S. No.	Word Meaning	IPA	Consonant
1.	'mengadian' dung (of goats)	[meŋŋjã]	[ŋ]
2.	'sunj' barren	[suɲ]	[ɲ]
3.	'kand' defect (in one eye)	[kaɳ]	[ɳ]
4.	'galha' stupid	[ɠal^{h}a]	[l^{h}]
5.	'anhar' virile	[an^{h}ʌr]	[n^{h}]
6.	'landha' loan	[laɳ^{h}a]	[ɳ^{h}]

References

Archibald, J. (1998). *Second language phonology* (Vol. 17). Amsterdam/Philadelphia: John Benjamins Publishing Company.

Babel, M. (2008). The Phonetic and Phonological Effects of Moribundity. *University of Pennsylvania Working Papers in Linguistics, 14*(2), 24-34.

Cherciov, M. (2011). *Between Attrition and Acquisition: The Case of Romanian Immigrant Contexts.* PhD, University of Toronto.

Cissé, I., Demolin, D., & Vallée, N. (2011). *The Acquisition of Plosives and Implosives by a Fulfulde-speaking Child Aged from 5 to 10;29 Months.* Paper presented at the ICPhS XVII, Hong Kong.

Clements, N. G. O., S. (2002). Explosives, implosives and non-implosives: The linguistic function of air pressure differences in stops. In C. G. N. Warner (Ed.), *Laboratory Phonology* (pp. 299-350). Berlin: Mouton de Gruyter.

de Bot, K. (1998). The Psycholinguistics of Language Loss. In G. Extra & L. Verhoeven (Eds.), *Bilingualism and Migration* (pp. 345-361). Berlin/New York: Mouton de Gruyter.

de Lacy, P. (2007). *Markedness: reduction and preservation in phonology*. Cambridge: Cambridge University Press.

Ecke, P. (2004). Language attrition and theories of forgetting: A cross-disciplinary review. *International Journal of Bilingualism, 8*, 321-354.

Eckman, F. R. (1991). The structural conformity hypothesis and the acquisition of consonant clusters in the interlanguage of ESL learners. *Studies in Second Language Acquisition, 13*(01), 23-41.

Hansen, L., & Chen, Y. L. (2001). What counts in the acquisition and attrition of numeral classifiers? *JALT, 23*, 90-110.

Herdina, P., & Jessner, U. (2002). *A Dynamic Model of Multilingualism: Changing the Psycholinguistic Perspective* Clevedon: Multilingual Matters.

Hock, H. H. (1991). *Principles of Historical Linguistics* (2nd ed.). Berlin: Mouton de Gruyter.

Iverson, G. K., & Salmons, J. C. (2008). Germanic Aspiration: Phonetic enhancement and language contact. *Sprachwissenschaft, 33*(3), 257-278.

Ladefoged, P., & Maddieson, I. (1996). *The sounds of the world's languages*. Oxford: Blackwell.

Larson-Hall, J. (2010). *A guide to doing statistics in second language research using SPSS*. New York: Routledge.

Maddieson, I. (1984). *Patterns of sounds*: Cambridge University Press.

Opitz, C. (2011). *First language Attrition and Second Language Acquisition in a Second Environment.* PhD, Trinity College Dublin.

Paradis, M. (1993). Linguistic, psycholinguistic and neurolinguistic aspects of interference in bilingual speakers: the activation threshold hypothesis. *International Journal of Pscholinguistics, 9*(2), 133-145.

Schmid, M. S. (2007). The role of L1 use for L1 attrition. In M. S. S. B. Kopke, M. Keijzer and S. Dostert (Ed.), *Language attrition: theoretical perspectives* (pp. 135-153). Amsterdam/Philadelphia: John Benjamins.

Schmid, M. S. (2011). *Language Attrition*. Cambridge: Cambridge University Press.

Schmid, M. S. (2012). The impact of age of exposure on bilingual development in international adoptees and family migrants: a perspective from holocaust survivors. *Linguistic Approaches to Bilingualism, 2*(2), 177-208.

Schmid, M. S. (2013). First Language Attrition. *WIRE's Cognitive Science, 4*(2), 117-123.

Schmid, M. S., & Dusseldorp, E. (2010). Quantitative analyses in a multivariate study of language attrition: the impact of extralinguistic factors. *Second Language Research, 26*(1), 125-160.

Seliger, H. (1996). Primary language attrition in the context of bilingualism. In R. Bhatia (Ed.), *Handbook of second language acquisition* (pp. 605–626). San Diego: Academic Press.

Shapiro, M. C. (2007). Hindi. In G. Cardona & D. Jain (Eds.), *The Indo-Aryan Languages* (pp. 250-285). London: Routledge.

Varga, Z. (2012). *First language attrition and maintenance among Hungarian speakers in Denmark.* PhD, Arhus University.

/ʌ/ Sound among Hausa Native Speakers of English

Rimi Saleh Baguddu

Pronunciations of some sounds are often determiners of differences between one language(s) and another. While some sounds are pronounced differently across languages, some others tend to be completely absent in some languages. The /ʌ/ is one of the sounds that only a few languages over the world exactly have. Many languages even among some varieties of English do not have the sound exactly in all positions. This paper explores the way the Hausa speakers of English pronounce this vowel. The study is based on data collected from four (4) Hausa speakers of English. Praat software was used to analyse the data.

Keywords: Backness, pre-fortis clipping, rhotacization, velopharyngeal.

1. **Introduction**

The English vowel /ʌ/ which exists in words such as 'cup', 'enough' and 'love' is one of the shortest yet stressed vowels. Though, it shares similar characteristics with the weak unstressed schwa /ə/. Like /ə/, /ʌ/ is also a "central vowel with no lip rounding, but the position of the tongue is high low" for /ʌ/ (Thorum, 2012) although, not as low as the German vowel /a/. However, there was no formal difference between /ʌ/ and /ə/ in the transcription systems scripted during the eighteenth century. The stressed vowel sound /ʌ/ is observed in different spellings in words of English, for instance, und*e*r, b*u*t, l*o*ve, y*ou*ng, d*oe*s, bl*oo*d, c*o*mpass and en*ou*gh (Hickey, 2010).

Hausa has approximately 30 million as first language speakers. The number of Hausa speakers is more than any other sub Saharan African language. The language excludes the English vowel sounds /ə/, /ʊ/, /ʌ/, /æ/ and /ɜ/ though it shares the other English vowels. Hausa which is a stress-free syllable-timed tonal language consists of 10 vowels, 5 long and 5 short counterparts. It also contains 2 diphthongs (Jaggar, 2000).

Due to specific vowel phonemic inventory of Hausa, it turns out to be a challenge for the Hausa people to pronounce some vowels accurately as in RP. In particular, the English vowel /ʌ/, which is central to the current research, is observed (heard) in the speech of Hausa people different from that in RP. Therefore, the following hypothesis is drawn;

(a) The Hausa people pronounce it as /a/,
(b) alternatively, theypronounce it as /o/

which probably is an influence of their mother tongue (the Hausa language).

In light of the above stated hypothesis, the research aims to examine the articulation of the English vowel /ʌ/ amongst the Hausa native speakers, considering its existence in the syllable initial and syllable medial position.

2. **Background**

2.1. **English Vowels**

All English vowels are voiced. The English vowels consist of 12 monophthongs, i.e. /i/, /I/, /e/, /æ/, /ɒ/, / ɔ:/, / ʊ/, / u/, / u:/, / ʌ/, / ɜ:/, /ə/, and 8 diphthongs that are /eɪ/, / əʊ/, / aɪ/, / ɔɪ/, / aʊ/, / ɪə/, / eə/, / ʊə/ (Crowther, ed. 1995). English vowels can be categorised as high, mid or low pertaining to the tongue level within the oral cavity and the position of the jaw, that is to say, the raising and lowering of the jaw. These can be called as front, central and back vowels, and this depends significantly on if the tongue is far in front or at the back within the oral cavity. It also matters which part of the tongue is involved during utterance. Besides that, these sounds which are core in syllables are named as either lax or tense. This is due to the amount of tension created in the production of a vowel, the gliding of the vowel, its existence in open or closed syllable and the place of articulation (the position of vowel quadrant). Vowels too are labelled on account of lip rounding during their articulation. In short, it is quite impossible to address a vowel with just any one of the features mentioned above (Celce-Murcia, 1996).

It is also observed that vowels are influenced by the environment within which they occur; they are longer before the voiced consonants. There are differences in the sound of vowels when they precede certain consonants such as /r/, /l/ and the nasals. The environmental influence not only involves the lax vowels but also the tense vowels. Nevertheless, the tense vowels are the longest when preceding the voiced consonants and the shortest sound when preceding the voiceless consonants. This refers to pre-*fortis* clipping.

Apart from that, all vowels tend to go through reduction when they are in the unstressed syllable. In other words, they are reduced if they are in a syllable or a word (in a speech) which is less important, and therefore, left unstressed. When the stressed vowels get unstressed, they take the form of weak unstressed vowel /ə/, which is commonly known as schwa, its German name (Celce-Murcia, 1996; Ladefoged, 2001).

The vowel /ʌ/, also known as wedge is central to the research. Thorum (2012) describes precisely the articulation of the vowel as

“The airflow from the lungs passes through the closed vocal folds to create vibration and sound waves (voiced). The velopharyngeal port is closed and the sound waves are directed into the oral cavity. The tongue is somewhat retracted, and its sides are closed against the upper molars. The front portion of the tongue is raised towards the palate (mid-central) just behind the alveolar ridge but does not make contact with it.’’

In other words, it is a voiced as well as central stressed vowels unlike the other central vowel i.e. schwa. In addition, the position of the tongue is mid central and the lip remains unrounded. The wedge is produced without much tension; thus it is known as a lax vowel too. Though short, /ʌ/ normally remains a stressed vowel. It appears in a closed syllable as in 'buck' but not in an open syllable without a consonant at the end. Furthermore, the vowel also occurs in the initial and medial positions only, for example, 'upper' and 'hunter'.

Ladefoged (2001) summarizes that there are six features which describe the quality of a vowel. However, the features height and backness are more prominent to distinguish the vowels from one another. He also mentions that it is true almost in each language. Features such as height, backness and rounding are the articulatory properties while the auditory properties include nasalization, rhotacization and ATR (Advanced Tongue Root). As mentioned earlier, height correlates the frequency of formant one, backness correlates the difference between frequencies of formant one ($F1_{Hz}$) and formant two ($F2_{Hz}$) and rounding correlates the F3.

2.2. Hausa Vowels

The standard Hausa comprises only thirteen vowels, five short monophthongs, a, e, i, o and u and five long aa, ee, ii, oo and uu which are also written as ã, ẽ, i, o and ũ and aː, eː, iː, oː and uː; it also has three diphthongs, ai, au and ui. Similarly to English, Hausa too has the articulatory properties that are height, backness and rounding, so its vowels are also categorised in the same way as the English vowels (Sani, 2005).

Hausa, a tonal language, often has minimal pairs of words - of the same spelling yet different in meaning. The vowel length distinguishes the meaning in these pairs, to illustrate, /fitoo/ – ferrying and /fiitoo/– whistling. Vowels are significantly different in open and closed syllables. An open syllable may consist of any length of vowels unlike the closed syllable. The latter is formed with a short vowel. Another phonological feature that concerns vowel is neutralization. The vowels /e/, /o/, /ai/ and /au/ neutralize to 'a' in a closed syllable, for example, /maʃen/ – /maʃan/, /gwadon/ – /gwadan/, /dagatain/ – /dagatan/ and /tabaraun/ – /tabaran/. This is noticed in closed syllables which end in /n/.

Gruyter (2004) has cited from Jibril (1986) and Jowitt (1991) and finds interesting information about the vowels of the educated Hausa English. He notices that the phonemic vowel length is inadequate. Occasionally, their pronunciation – vowel sounds seem to differ greatly from the RP. The examples are, /I/ in kit, /ə/, /a/ in dress, /aː/ in nurse and /ɒ/, /ʊ/ in strut. /I/ (kit) is closely approximated while in dress the vowel is realized as /ə/, /a/. Meanwhile, in nurse, /aː/ is understood as the vowel and in strut the allophone of /a/ which is close to /ʌ/ is articulated. The researcher too identifies another phonological process where there is a tendency amongst the educated Hausa English to gemmination such as in /gʌmmənt/ for government.

3. METHODOLOGY

The method taken in this research is a quantitative one, where data was collected from 4 male participants. All the participants were male native speakers of Hausa language. They are all students, who are exposed to some Western education. The data was taken through recording method, using Praat.

The participants were asked to pronounce some words, containing the /ʌ/ sound. But some other words were also mixed among the words containing the /ʌ/ sound, in order not to allow the readers to guess and know what the researchers were looking for, equally, in order to have a spontaneous natural flow of the pronunciation of the target words. Similarly, all speakers were asked to pronounce the words separately, so as to avoid them from being influenced by the pronunciation of each other.

The sound /ʌ/ appears at word initial and word-medial position in English. Therefore, English words that contain /ʌ/ sound were presented to the participants and they were asked to individually utter the words, in isolation, and in sentences, to ascertain the accuracy of the data. The words which were examined include;

Upper, Utter, Hut, Bug

“Upper” and “Utter” contain the English vowel sound /ʌ/ in word initial position, while 'hut' and 'bug', contain /ʌ/ in word medial position. The vowel is not found in word final position.

These words were also put and produced in sentences, so as to see if there exits any difference concerning the context of the words, in isolation, and in sentences. The sentences which were presented to the speakers are given below:

Table 1: Stimuli

S.No	WORDS USED IN ISOLATION	SENTENCES IN WHICH THE WORDS WITH /ʌ/ SOUND APPEAR.
1	Bug	She picked up a bug last Tuesday.
2	Power	People struggle for power all the time.
3	Utter	This is an utter surprise to me.
4	Snobbish	She is a snobbish type.
5	Hut	We live in a hut.
6	Spray	I bet the spray painting will fail.
7	Upper	He is from an upper class.
8	Pretentious	They are really unpretentious.

As can be seen in table above, the words; hut, bug, upper and utter, were all presented in words and in sentences. Other words were also mixed, so as to misguide the participants, not to guess what is being tested and give it a special emphasis and attention.

4. DATA ANALYSIS

As discussed above, the data were gathered through an interview with 4 male Hausa native speakers. Praat programme was used to analyze and compute the data phonetically. All the participants' pronunciation was measured to get the formant frequency, especially the F1 and F2. The average F1 and F2 of each word was taken, together with what appeared in word in isolation and while the words were produced in sentences. All these, were carefully measured.

The results found by the researchers shows that, there is no much difference between the utterance of the whole speakers, especially as regards the words in isolation and while the words are in sentences, and this was presented to be nearly the same. Secondly, the sound /ʌ/ as it appears in English language happens to be a mid-low central vowel, but that is not the case while it was pronounced by the Hausa participants.

5. **FINDINGS**

This section informs the /ʌ/ sound position as articulated by the Hausa native speakers; the Figures reflect the position of the vowel at word and sentence level. Figure 1 presents that the average of F1 and F2of the /ʌ/ in initial position at word level is 585 and 1116 respectively as produced by the Hausa speakers. Meanwhile, the average of F1 and F2 of the /ʌ/ in the word initial position at the sentence level is 599 and 1107 respectively.

Figure 1: F1 and F2 of /ʌ/ in the words upper and utter

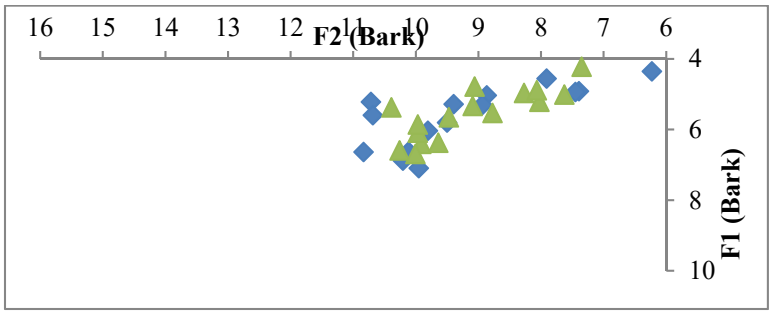


Figure 2 indicates that the average of F1 and F2 of the /ʌ/ sound in medial position at word level is 598 and 1299 respectively as produced by Hausa speakers. The average of F1 and F2 of the /ʌ/ sound in word medial position at sentence level is 591 and 1282.

Figure 2: Formant values of /ʌ/ in the words 'hut' and 'bug'

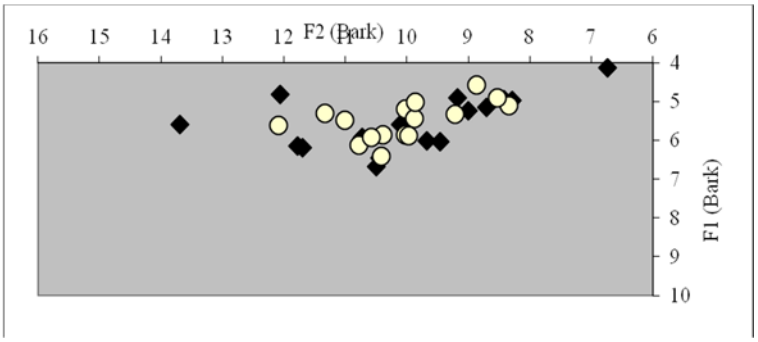
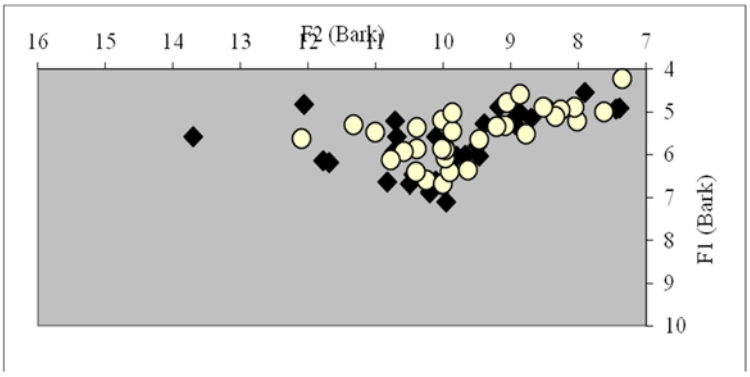


Figure 3 describes the overall findings pertaining to the production of the /ʌ/ amongst the Hausa native speakers. It represents the sound at both word and sentence level. While the black indicates the vowel sound at word level, the white circle informs the vowel sound at sentential level. The vowel production has clustered around one area as shown in Figure 3. This suggests that the informants produce the sound in nearly the same phonetic environment with a slight variation. In other words, it is observed that the position of /ʌ/ sound, produced by Hausa speakers varies from that of the production of English native speakers. Moreover, the position of /ʌ/ in their production moves to the place of / u /.

Figure 3: The overall formant values of /ʌ/



5. **CONCLUSION**

Based on this research, we come to the conclusion that Hausa native speakers have a different variety of English vowel sound /ʌ/, which has different F1 and F2 measurements. This may be as a result of many factors, that need a further research, which shall have to delve deep into in a future project. This may be a good socio-phonetic field research that will provide an in depth knowledge about why the variation occurs. Some of the foreseen reasons may include; mother tongue influence, an influence that has to do with learning the Hausa Roman alphabets, where /u/ vowel is always pronounced as [u] and is not context dependent, rapid speech, lack of exposure to general learning of English sounds, societal influence of exerting the status of Nigerian English, and so on.

/ʌ/ Sound among Hausa Native Speakers of English

REFERENCES

Collins, B and Mess, M. I (2003). *Practical Phonetics and Phonology:* a resource book for students. London Routledge Taylor and Francis Group.

Guessenhoven, C. & Jacobs H. (1998). *Understanding Phonology*. Britain J.W Arrowsmith LTD.

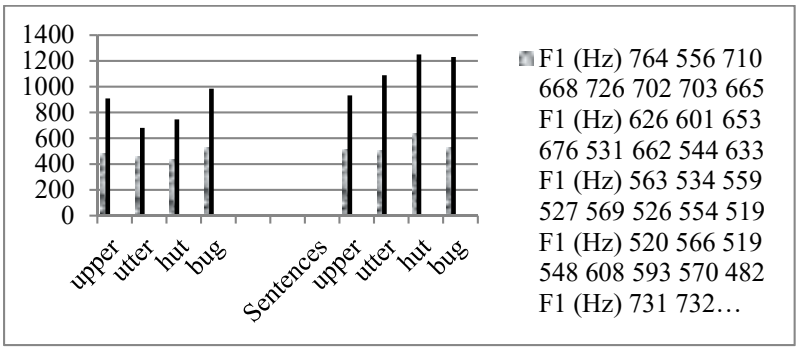
Ladefoged, P. (2001). *A course in Phonetics.* Heinle and Heinle, Thomson Learning. USA. Fourth Edition.

Sani, M.A.Z (2005). *An Introductory Hausa Phonology.* Kano Benchmark Publishers.

Sani, M.A.Z (2005). *Jagoran Nazarin Tsarin Sautin Hausa.* Benchmark Publishers.

Stevens, K.N (2000). *Acoustic Phonetics*; London MIT, Press.

Appendix A: Graph showing overall formant values



Investigating Teacher Code-switching at Higher Secondary Level in English and Science Classrooms in Pakistan.

Khursheed Ahmad (ahmadmalik2007@gmail.com)
Illahi Bakhsh Gopang (ibenglican@gmail.com)

This study examined instances of teacher code-switching at higher secondary level in English and science classrooms in one of the colleges run by Pakistan Air Force, where English is used as a medium of instruction for science. Data for the desired study were obtained by observing two English lessons and a science (Physics) lesson. Data (instances of teachers' codes-switching) were analyzed using Gumperz's (1982) semantic model. It was found that code-switching in the two English lessons was quite different, with no code-switching in the teacher facilitated lesson. However, the lesson in which English was taught as a content subject was similar to the science lesson with frequent use of code-switching. One interesting fact was that the direction of the language switch was not only from English to Urdu (National language of Pakistan) but some instances of Code-switching to Pusthto and Hindko (Local languages) were also observed. It suggests that though the medium of instructions in defense-run colleges in Pakistan is English, code-switching is an inevitable tool for teachers to achieve teaching goals in content-based lessons, particularly science lessons.

Key words: Code-switching, English, Pakistan, Hindko, Pashto

1. Introduction

According to Ting (2007) in multilingual cultures and communities, code-switching occurs in daily life discourse and can extend to teaching and learning activities in classroom where a particular language is officially specified as a language of instruction. Teacher's code-switching takes place especially in content based subjects such as History, Linguistics and Science (Martin, 1999; Mwinsheikhe, 2003; Probyn, 2005). Martin (1996) conducted a study at level 4 and 5 in Brunei Darussalam and concluded that code-switching frequently takes place while teaching history, science, geography and mathematics with almost no code-switching. Studies and related literature has revealed that code-switching is indispensible at various levels: Kindergarten to university because it can facilitate students' comprehension of content of the lesson. Ustunel (2004) states that teachers use code-switching to cure silence or to cover troubles in classroom. However, the finding stated above are based upon teachers reported observations and reasons for code-switching in classroom. To understand different forms and functions of

code-switching which takes place inside classroom, classroom observation to record naturally occurring instances of code-switching will provide a better understanding of the phenomenon of code-switching. Generally Gumper'z (1982) model which was designed for the study of understanding of social and cultural meaning of language is the best approach (Nilep, 2006).

1. Gumper'z Model and Students Code-Switching

In classroom environment, Gumper'z model is found useful for the study of use of code-switching by students and teachers. Choi and Kuipers (2003) studied the conversation of two bilingual Hispanic and two monolingual English students in a chemistry class. They found that Hispanic students while explaining a procedure of a problem, switched between English to Hispanic and from Hispanic to English to clear the procedure. They switched their code many times for the sake of quoting and stressing an idea. Similarly Zing (2009) conducted a study in Melbourne to examine code-switching among 30 Chinese students ranging from age six to eight. The interviewer used Chinese only as the language of interview while students switched between English and Chinese when responding to the questions. It was thus concluded that the situational switch may occur due to a change in context.

2. Teachers Code-Switching

We have seen that Choi and Kuipers (2003) and Zheng (2009) conducted studies about code-switching at student's level; however other researchers took interest in code-switching taking place at teachers' level. The major study regarding teachers' code – switching was conducted by Mahadhir and Then (2007) examined code-switching done by Nine- pre service teachers in their classrooms in Malaysia. Code switching mostly takes place for calling attention and personalization in the classroom. Moreover code-switching is done for the sake of making the students to understand the content as well the vocabulary. In another study which was conducted by Seidlitz (2003) in Germany on five American teachers and three German teachers. It was found in the study that American teachers had more situational switches than the native German teachers. Moreover it was found that reiteration of the German teachers was more frequent than the American teachers while the reiteration of the American teachers was lengthier than the German teachers. The American teachers used the German language first and then explained that concept in English while for the German teachers the matter was totally reversed because they used English first and then explained that concept in English. The American teachers used to switch when they thought that students would misunderstand the concept on the hand German teachers used to speak in the language which students demand them to speak in. American teachers used English for humour, praise and courage while the German teaches did that in reverse. All the above studies confirmed that code- switching took place in classrooms at student's level as well as teacher's level.

Code-switching can be defined as the use of more than one code or language in the course of a single speech event (Gumperz, 1982), taken to refer to teacher utterances in the classroom for this study This study examines the discourse functions of teacher code-switching in secondary school English and science classrooms in Pakistan.. The teachers' use of code-switching to convey meanings to students was analysed using Gumperz's (1982) semantic model of conversational code-switching. In this paper, I show that it is the content knowledge or language focus of the lesson that influences the discourse functions of choice of the "official" language of the classroom or other languages. The findings point to selected code-switching functions being useful for teachers to achieve teaching goals in classrooms where lack of proficiency in the instructional language might compromise learning.

3. Research Site

The setting for the study is Pakistan. The study was conducted in three different classes at PAF Inter College Kohat. National language of Pakistan is Urdu however; the medium of instruction at the above mentioned college is English because it works under Pakistan Airforce. The majority of students can understand English easily but only a handful is able to speak correctly and efficiently.

3.1. Participants

The participants were two English teachers and a Science teacher with masters in their respective fields with more than 10 years teaching experience and equally fluent in English and Urdu.

3.2. Data Collection

For the purpose of comparing the nature of code-switching in science and English lessons, two lessons were selected from a corpus of English lessons. The first was a lesson with frequent code-switching. For contrast, a second English lesson with few instances of code-switching was selected. The classroom data for the science teacher were collected as part of a larger study. Prior to the data collection, verbal consent was sought from the teachers and they were requested to audio-record a single 50-minute lesson. Total recorded duration for each class was 200 minutes i.e. four classes each teacher. The transcripts were analysed for code-switching functions using Gumperz's (1982) semantic model encompassing situational and metaphorical code-switching.

4. Results and Discussion

This section presents the results on code-switching in the English and science lessons. Table 1 is the expression of a number of code-switching instances took place during three lessons i.e. two content based lessons; English and Science and one English language lesson.

Table 1. Frequency of Teacher Code-switching in the English and Science Lessons

Lesson	Topic	Code-switching instances
English 1	The poem: One way of Love	18
English 2	The Stuffed Trout	5
Science 1	Sample machine: Lever	20
Total		43

The results show that there were 43 instances of code-switching in form of phrases, sentences and sometimes words, in the three lessons combined (Table 1), involving mainly English and Urdu. Both the science teacher (n=20) and English Teacher 1 (n=18) code-switched frequently during the lesson but English Teacher 2 code-switched very little when he taught reading skills (n=5). The frequency does not take account of the word "Okay" as an example of code-switching as it may not be considered as an English word any longer.

Table 2. Frequency of Code-switching Functions in Science and English Lessons

Functions of Code-switching	Scien	Englis	English	Tota	%
Reiteration	8	9	0	17	39.53
Message Qualification	10	6	0	16	37.20
Interjections	2	1	0	3	6.97
Quotations	0	0	03	3	6.97
Personalization and Objectivisation	0	0	02	2	4.65
Addressee specifications	0	01	0	1	2.32
Situational code-switching	0	1	0	1	2.32
Total	20	18	05	43	99.96*

Table 2 shows that the most common discourse functions of code-switching were reiteration (39.53%) and message qualification (37.20%), and these were used only by the science teacher and English Teacher 1.For example, English Teacher 1 said

[reiteration(*Mukhtasaran* ('as a whole') to sum up his explanation on point of view in a poem. Similarly, the science teacher said *samajh ayi?* ('got it?')]. Similarly Jeffery Chaucer, [Messag Qualification(*Jo k Angrezi shairi ka baba he*) wrote Prologue to the Canterbury Tales.

4.1. Teacher-fronted Content Lessons

The science lesson was conducted in class with a simple teacher demonstration of the operation of levers. It was not a laboratory session where students had hands-on experience experimenting with the three types of levers. The science teacher began the lesson by explaining the working of a simple lever. He initially explained the essential elements of a lever (load, effort, and fulcrum) in English and reiterated the explanation in Urdu. He also elaborated on his explanation by interspersing the use of English and Urdu. The alternation of reiteration and message qualification is illustrated in examples given below.

*In English it is called fulcrum which is represented by F. [**Reiteration** (isy F sy zahir kya jata hai)]*

*To life a load you need to exert some force. [**Message qualification** (ksi bhe cheez ko uthany k ly kowat ki zarurat hoti hai) Hindko Language - Appny hth nal ye ksi hor shai dy)]*

*It consist of three parts : you must have a fulcrum, load and force [**Reiteration** (yani teen chezain zaruri hai ek fulcrum dosra wazan aur kuwat)]*

*The force end should be longer then a load end [**Message qualification** (yani agar wazan ka bazoo 2 inch ho to kuwat ka bazu 4 inch hona chahye)*

Example 1.

In this example, the science teacher uses using English to explain how effort needs to be exerted for a lever to lift a load while resting on a fulcrum. He reiterated by translating it to Urdu (*Kisi bhe cheez ko uthanay k ly takat ki zrurat hot hai*). He went on to qualify what he meant by making a reference to the students' force and load/object (*kisi cheez yaw azan to uthany k ly hm force yani kuwat ka istemal kerty hai*). Following this, the science teacher talked about the three parts of a lever again and immediately reiterated the concepts in Urdu. This pattern of alternation between reiteration and message qualification with the message first given in English and then Urdu seemed to have worked for the science teacher because he used this pattern throughout the lesson. The use of English seemed to be a launching pad for the explanation in Urdu, considered as

the part that students could grasp. This tendency arose from his use of English as the base instructional language for the science lesson, in compliance with government/ Armed forces language policy. However, the science teacher had to code-switch to Urdu during the lesson because his students complained that they could not understand a new topic if he used only English--and this was from a class considered the second best in the school. Technical vocabulary was a problem. To familiarise his students with the key terms for the topic (i.e. fulcrum, effort, and load), he embedded the English lexical items in the Urdu discourse, similar to linguistic strategies used by two English teachers in Martin's (2005) study in two Malaysian schools.

English Lesson 1 was about a literary element of a poem, the point of view used by the writer of the poem, making it a content-oriented language lesson. English Teacher 1 began the lesson by reviewing what was taught in the previous lesson about central idea and individual thoughts in the poem before introducing the notion of "first person" and "third person" point of view, which was reiterated with a translation into Urdu to help students draw upon their background knowledge. English Teacher 1 proceeded to cite evidence from the poem (e.g., the use of "I") to show that it was the poet expressing his feelings using the first person point of view. When asked whether they understood, the students replied in no, after which he made another attempt to re-explain "point of view", and this time beginning with Urdu, as shown in example below:

What is a point of view?

A person who is speaking in the poem ***[Reiteration*** *(jo shakhs kisi bhe nazam ya ghazal me bol raha ho)] who do you think is speaking in this poem? [* ***Message qualification*** *(Robert Browning jo k is ka shair bhe hai khud bol raha hai)]*

You can see that poet himself speaks that's why it is called first person point of view.

*Robert Browning is an optimist [****Reiteration*** *(masbat soch wala , perumeed batain kerny wala)]*

*The poet is expressing his internal feelings about love [****Message qualification*** *((Pashto language) laka khpal da zra khabara wayi mung ta)]*

4.2. Teacher-facilitated English Lesson

In contrast to the teacher-fronted science lesson and English Lesson 1, where teacher acts like a leader or to be more precise a dictator, English Teacher 2 facilitated a reading lesson by asking students questions and building on their responses. Only Five instances of code-switching were identified (Table 2). This section describes the functions of code-

switching which could occur despite the teacher's attempt to keep to an English-only lesson. In this lesson on *The Stuffed Trout*, English Teacher 2 began by asking students to look at a picture on The Stuffed Trout, and state the gist of the story. After an effortful sixteen-turn attempt, a student finally said, big lies. The teacher prompted for the meaning but inferring big lies from contextual clues proved too difficult for the students. Realizing the complexity of the task, he called upon a student to role-play the scenario in the picture with him to explain its meaning. This time he was successful and students responded with laughter and side remarks. He went on to ask the students about the number of characters in the dialogue, their identity, their relationship with one another, and the real life context of the scenario before getting students to role play two scenes based on the dialogue. Throughout the lesson, English Teacher 2 said only two non-English words, the first was initiated by him and the second by his student. After giving students some time to read the dialogue, he repeatedly asked the students if they had finished, only to be met with silence and soft replies of "yes". So he said, "Why? Why do you all not want to answer me? You are afraid or what?" the teacher got angry and said " if you don't answer me , I will make you *dadu*. The closest translation of "I will *make* you dadu" in this context is "I will mak mp like frog" but the Urdu word carries the meaning of getting the person into trouble and pain. In this context, English Teacher 2 stated his observation of the students' silence in response to his question, and proceeded to make a guess that the students did not want to answer in case he called upon them to answer the questions that follow. We coded this instance of code-switching as personalization, where the personal opinion of English Teacher 2 is indicated and where the teacher used his personal influence in the form of a threat. The personalization strategy worked and the students were more responsive after that. The other incidences of code-switching by English Teacher 2 happened on another occasion when he was illustrating what a conversation was. He gave an example of a conversation starter as "how are you today?" and instructed a student to answer him. A student unexpectedly answered "*thak gya ho sir"* ('got tired, an example of *reiteration.*

5. Conclusion

The above results clearly confirms that in Pakistani deference- run colleges, code-switching takes place most frequently in content based lessons than those lessons in which content is not supposed to be conveyed to the students rather the focus is on listening or speaking skills. Moreover, teachers use local languages to make his/her students understand the concepts. The use of code-switching is made to ensure the content to be comprehend by the students for whom it is meant while in those lessons in which content is not meant to be conveyed, a very few instances of code-switching were observed in defense colleges of Pakistan.

References

Choi, J., & Kuipers, J. (2003). Bilingual practices in a science classroom: Bilingual Hispanic students' ways of constructing school science. Retrieved March 28, 2006, from http://www.gwu.edu/~scale-up/EQRE.doc

Mahadhir, M., & Then, C. O. (2007). Code-switching in the English language classrooms in Kuching secondary schools. Sarawak Museum Journal, Special Issue No. 7 on Social Sciences and Humanities, LXIV(85), 197-219.

Martin, P. W. (1999). Encounters of a bilingual kind: Interactional practices in the primary classroom in Brunei. International Journal of Educational Development, 19, 127-140.

Martin, P. (2005). "Safe" language practices in two rural schools in Malaysia: Tensions between policy and practice. In M. Y. Lin & P. W. Martin (Eds.), Decolonisation, globalization: Language-in-education policy and practice. New perspectives on language and education (pp. 74-97). Cleveland: Multilingual Matters.

Mwinsheikhe, H. M. (2003). Using Kiswahili as a medium of instruction in Tanzania secondary schools as a strategy of improving student participation and performance in science. Journal of Instruction in Tanzania and South Africa, 129-148. Nilep, C. (2006). "Code Switching" in sociocultural linguistics. Colorado Research in Linguistics, 19(1). Retrieved June 19, 2009, from http://www.colorado.edu/ling/CRIL/Volume19_Issue1/paper_NILEP.pdf

Probyn, M. J. (2005). Learning science through two languages in South Africa. In J. Cohen, K. T. McAlister, K. Rostlad & J. MacSwan (Eds.). Proceedings of the 4th International Symposium on Bilingualism. Somerville, MA: Cascadilla Press.

Seidlitz, L. M. (2003). Functions of codeswitching in classes of German as a foreign language. Unpublished doctoral dissertation, University of Texas, Austin.

Ting, S. H. (2007). Influence of ethnicity and hierarchical status on language choice in a multilingual organization in Sarawak. Sarawak Museum Journal, Special issue No. 7, LXIV(85), 221-250.

Ustunel, E. (2004). Preference organization in learners' language choice following teacher-initiated and teacher-induced code-switching in Turkish EFL classrooms.

Zheng, L. (2009). Living in two worlds code-switching amongst bilingual Chinese-Australian children. Australian Review of Applied Linguistics, 32(1), 5.1-5.18. DOI: 10.2104/aral0905.

Acoustic Analysis of Pakistan English Vowels: A Comparative Acoustic Analysis of Pakistan English and Singapore English Vowels

Zahid Ali Veesar (zahiimahii85@gmail.com)

This paper presents acoustic analysis of Pakistani English vowels in comparison with Singaporean English vowels. The main purpose is to see if Pakistani spoken English in terms of vowels is different from Singaporean English. The paper confirms the findings by Asim (2011) which establishes Pak English as a separate variety of English. This research tries to analyse the height (F1) and quality (F2, front and back) of Pakistani English vowels, and also to analyse the difference between Pakistani English and Singaporean English vowels. The data have been collected through recording the sounds of five Pakistani male speakers' vowels during reading a piece of written material "North Wind and Sun" which they were given to read. The data of three speakers out of five have been used for analysis. While Singaporean English speaker's recording has been downloaded from internet. It was assumed, before the analysis, that the two varieties would be different from each other. But, after analysis, it was found that there is no major difference in Pakistani and Singaporean English vowels, though slight difference has been noted in the F1 and F2 of the sounds /ɒ/, /ɔ:/ and /ɜ:/ . However, it is suggested that larger set of data may be used to claim that both Pak English and Singapore English are two different varieties of English language.

Key words: PRAAT, Acoustic analysis, Pure Vowels, Formants

1. Introduction

English is spoken as an international language all over the world. It is spoken as first language in more than fifty independent States or countries of the world. Almost half of the population of the world speaks English language as a source of communication. In the present world, it is the language of science, medicine, arts, literature, business, engineering and most importantly computer and internet. It is used as a language of trade in the form of lingua franca (a language which is shared by non-native speakers). It has many varieties across the world, among them Pakistani English variety is the one which is spoken in Pakistan. Pakistanis use mixture of both varieties British English and American English (BrtE and AmE); some people prefer to use AmE while others like BrtE. Since Pakistan was a colony of Britain; thus, most of the people prefer BrtE to AmE. Many studies have been done to prove PakE as a separate variety of English language. Asim, Sumera & Shahida, (2011) studied front vowels in Pakistani English;

they compared Pakistani English front vowels (/i:/, /I/,/e/ and /æ/) with those of AmE and found that Pakistani English is different from American English and hence is a separate variety of English language.

1.1. Statement of Problem

The problem of this research paper is same as that of Asim, Sumera & Shahida (2011) to prove that Pakistani English as a separate variety of English language. It compares its vowels with those of Singaporean English (SgE). They conducted the research to prove Pakistani English vowels and to prove it as a separate variety.

1.2. Research Objective

This research paper aims

1- to analyse length and quality (F1 and F2) of Pakistani English vowels, and

2- to see the difference between Pakistani English and Singaporean English vowels (Monophthongs or pure vowels).

1.3. Research Questions

To obtain these objectives, this paper asks two questions:

1- what are the length and quality (F1 and F2) of Pakistani English?

2- How are Pakistani English vowels different from Singaporean English in terms of length and quality (F1 and F2)?

2. Literature Review

We can find many works on acoustic analysis of English vowels and other languages' vowels. Researchers have done works on world Englishes to find difference between vowels of varieties of English language, a little amount of work has also been done in Pakistan as well. Din and Rehman (2011) did the acoustic analysis of Pashto vowels and confirmed the findings of Yallop and Clark (1999) that "the smaller the number of vowels the lesser is their space from each other." Ahmed (2011) found that there are only two central vowels in Pakistani English and there is no /ɜ: / sound in it. As mentioned in Bilal. H (2011), 'Kachru (2005) described that there is no distinction between strong and weak vowels in Indian English. Deterding (2005) concluded that there are a few examples of reduced vowels in Singaporean English. Mesthrie and Bhatt (2008) reported that there are six short vowels in Pakistani English.' Farhat, Asim and Asghar (2010)

found that epenthesis is a regular feature of Pakistani English and it allows certain pattern. Asim, Sumera & Shahida (2011) studied "Front Vowels in Pakistani English". They compared PakE front vowels (/i:/, /I/, /e/ and /ae/) with those of AmE and found that PakE has different vowel formant frequencies and durations, which proved that Pakistani English is a separate variety of English .

To strengthen further the idea of Asim, Sumera & Shahida (2011) this research paper tries to find differences in PakE and SgE and to determine whether Pakistani English is a separate variety of English like other varieties of English language.

3. Methodology

This research uses quantitative research method (Creswell, 2004) with descriptive research design.

3.1. Participants/subjects

Five Pakistani male speakers doing PhD and Master programs in their respective fields, at University of Malay, were given a piece of written material "North Wind and Sun" to read, which was then recorded through PRAAT on a laptop. While Singaporean English speaker's recording of the same text was downloaded from internet.

3.2. Data Collection

The data of Singaporean English was collected through internet from "North wind and sun" in NIE corpus link. The same piece of written paragraph is given to five Pakistani English speakers to read freely, which was recorded in laptop through the software called PRAAT. Three out of five speakers of Pakistani English were selected to compare their vowels with those of one Singaporean English speaker. Due to the unavailability of resources only one speaker was selected from SgE and three speakers from PakE (having, Sindhi, Balochi and Punjabi L1), which is limitation of this research paper. Therefore, this study cannot be generalized for all Pakistanis and Singapore English speakers.

3.3. Analysis

Data were analysed with certain steps in a sequence. Firstly, the researcher measured the location of F1 and F2 of Singaporean English speaker using spectrogram on PRAAT. Secondly, researcher measured three Pakistani English speakers using the same process. It was found that all speakers (of SgE and PakE) had different F1 and F2 for English vowels (monophthongs). Thirdly, summary of each speaker (of SgE and PakE) was taken from excel file and put into word file so that their individual differences can also be seen and noticed. Finally, the data of three Pakistani speakers were measured and compared

with one Singaporean English speaker. All monophthongs, except schwa / ə/, were compared, and it is tried to find their probability value (p) through T-Test. The researcher took minimum three tokens of each sound
(e.g, /e/ in *when, attempt and confess*) in both varieties of English (PakE and SgE). Thus, total 12 tokens (09 tokens, 03 from each person, of PakE and 03 of SgE) for almost each monophthong vowel were taken, measured and compared with each other. However; for some sounds like /a:/, **/æ**/ and /**ɜ:/** the researcher got less than 12 tokens prior to the availability of the text. The results are summarized in the following tables.

Table 1: F1 values

Sound	Pak E	F1 SingE	p-value	t-value
/i:/	343	386	0.07	1.59
/I/	726	923	0.38	0.32
/e/	535	532	0.72	0.61
/æ/	645	524	0.07	1.67
/ʌ/	554	701	0.76	0.76
/a:/	715	364	0.96	2.09
/ɒ/	617	796	0.20	-0.87
/ɔ:/	617	648	0.02	-2.45
/ʊ/	440	449	0.52	0.04
/ɜ:/	533	567	0.04	-2.57
/u:/	387	385	0.72	0.61

Table 2: F2 values

Sound	Pak E	F2 Sing E	p-value	t-value
/i:/	2145	2134	0.09	1.13
/I/	2105	2382	0.08	1.54
/e/	1771	1422	0.72	0.27
/æ/	1708	1712	0.44	0.15
/ʌ/	1404	1594	0.76	0.73
/a:/	1366	1250	0.21	0.87
/ɒ/	1173	1389	0.02	2.29
/ɔ:/	1060	1156	-3.23	0.004
/ʊ/	1295	1366	-0.14	0.44
/ɜ:/	1418	1146	0.08	1.86
/u:/	1627	1377	0.71	0.59

4. Discussion

As discussed earlier, this research was to analyse the height and quality of Pakistani English vowels and to highlight the difference between Pakistani and Singaporean English vowels in terms of their F and F2. During the analysis it was assumed that PakE and SgE would be different from each other. But, after the analysis, it was found that there was no major difference between the two varieties. However; slight difference was seen only in the F1 for the sounds /ɔ:/ and /ɜ:/. The probability values of F2 also show a difference for the sounds /ɒ/ and /ɔ:/.

We also found that that F1 values of the sounds /ɒ/ and /ɔ:/ are equal, which means Pakistanis do not make difference between the height of the sounds, while F2 values of these sounds were seen as 1173 (Hz) and 1060 (Hz), which means /ɒ/ sound is more fronted as compared to the /ɔ:/ sound in Pakistani English. While F1 values of these sounds in Singaporean English was seen as 796 (Hz) and 648 (Hz) and F2 values 1389 (Hz) and 1156 (Hz), which means they differentiate between the two sounds and the /ɔ:/ sound is more higher and back warded than the /ɒ/ sound in SgE.

We also found difference in the F1 values of the /ɜ:/. F1 and F2 values of this sound in PakE are 533 (Hz) and 1418 (Hz), while in SgE they are 567 (Hz) and 1146 (Hz), which means this sound is higher and fronted in Pakistani English than Singaporean English.

6. Conclusion

To conclude we can say that Pakistani English vowels are not completely different from Singaporean English vowels. Though there are differences in the values of F1and F2 of these sounds, but the probability values show that there is no difference in the two languages. But, on the basis of this small scale and limited research we cannot claim that the two languages are different from each other.

This study attempted to analyse the Pakistani English and Singaporean English vowel sounds. The findings prove that PakE is different from SgE. A broader research is to be carried out with maximum data and subjects to find major differences in both Pakistani and Singaporean English.

Acknowledgement

Special thanks are paid to Dr. Tan Sui Richel, lecturer, Faculty of Languages and Linguistics, whose teaching, supervision and guidance was like umbrella to me, without which I could not be able to complete this paper. Secondly, I am thankful to Dr. Kais Amir, lecturer, Faculty of Languages and Linguistics, for his moral support to me. Thirdly, I am thankful to my University, Lasbela University of Ariculture, Water and

Marine Sciences, Uthal, Balochistan, Pakistan, for giving me opportunity for the higher studies. I am also grateful to my parents for their continuous moral and financial support. Besides, I am also thankful to my friends Auranzeb Alamgeer (my roomat), Junaid, Farhan, Zeeshan, Kamran, Ahmad, Alhaji, Hazirah, Afiqa and most importantly Rimi Saleh Baggudu for their support and help.

References

Ghani, R.-u.-D. R. (2011). The Acoustic Analysis of Pashto Vowels. *Language in India, 11*, 793- 797.

Asim, S. S. (2011). Front Vowels in Pakistani English. *International Journal of Academic Research, 3, No. 5, II* 393- 396.

Hafiz, B., A., W, A., Ali. , Talha, R., Nida, F., & Deep, S., T. (2011). Acoustic Analysis of Central Vowels of PakE. *International Journal of Linguistics, 3*(1), 01-13.

Jabeen, F., Asim, M., M., & Muhammad, A. (2012). Vowel Epenthesis in Pakistani English. *Interdisciplinary Journal of Contemporary Research in Business. 3*(10), 224-233.

Keerio, A., Lahhman, D. D., Asad, S. A., & Yasir, M., A. (2011). Comparative Analysis of Vowels, Dipthongs and Glides of Sindhi. *Signal & Image Processing: An International Journal (SIPIJ), 2*(4), 109-120.

Clynes, A., & Deterding, D. (2011). Standard Malay (Brunie). *Journal of the International Phonetic Association. 41*(2), 259-268.

Deterding, D. (2003). An Instrumental Study of the monophthong vowels of SgE. *English World-Wide., 24*(1), 1-16.

Edward, F., & Stephanie, J. (2007). Rosa's roses: Reduced vowels in American English. *Journal of International Phonetic Association. 37*(1), 83-96.

Shirai, S. (2004). Spectral Vowel Reduction in Japanese. *University of Washington Working Papers in Linguistics. 2*.

Meuniera, C., & Espessera, R. (2011). Vowel Reduction in conversational speech in French. *Journal of Phonetics. 39*(3), 271-278.

Influence of L1 laryngeal contrast on acquisition of allophonic Variance in English plosives

Nasir Abbas Syed (nasirabbassla@gmail.com)

This paper reports on a production test with 34 adult students of MA English in Pakistan. The participants speak Saraiki as their mother tongue. The experiment was conducted with a view to determine how the L1 laryngeal contrast influences the acquisition of English allophonic variance. The L1 of the participants has aspiration contrast at phonemic level (Syed, 2013) but in English, the same contrast is allophonic (Davenport & Hannahs, 2010). Pakistani English does not maintain the aspiration contrast in plosives because average Pakistani learners of English produce English stops without aspiration in all positions (Rahman, 1991). The same trend has also been observed in Indian English (Gargesh, 2004). The current study aims to know if advanced learners of English who have knowledge of English phonology maintain allophonic variance in English plosives on the basis of their knowledge of English phonology. For this purpose, VOT of English stops on simplex onset (when stops are produced with aspiration by native speakers) and on complex branching onset with [s] preceding the stops (when the stops are produced without aspiration by native speakers of English) produced by a group of adult Pakistani student learners in a carrier sentence and in isolation were taken. The VOTs were taken using Praat (Boersma & Weenink, 2012). The results show that, in most of the cases, there is no significant difference in the VOTs of stops produced in isolated words and in carrier sentences. The VOT increases from labial to coronal to velar stops. Maximum learning is observed in the acquisition of velar and minimum in the coronal stops. The voice onset time for English unaspirated coronal stop in the word 'steal' is bigger than that in the word 'teeth'. This is because in the word-initial position, the English /t/ is pronounced as retroflex by Pakistani learners but in 'st' cluster, it is produced as alveolar on account of articulatory constraints.

Key words: Aspiration, L2 acquisition, Pakistani English, plosive, voice onset time

Introduction

English was imported as a language of the British colonialists in the Subcontinent of Pakistan, India and Bangladesh. Being the language of the rulers, it enjoyed a prestige of being the sole official language of the Subcontinent for approximately one hundred years of the colonial era. In 1947, when the Subcontinent got freedom, the government of akistan decided to adopt English as a language of official communication and correspondence till it is thoroughly

replaced by Urdu the national language of Pakistan (Rahman, 1996) . In this way, English continued enjoying the status of being the sole official language of Pakistan even after the departure of the English rulers from the Subcontinent. Since the importance of English increased with the advent of science and technology, it remained an official language of Pakistan. Now, it has become a second language of educated class in the country. Although English remained successful in retaining its official prestige in Pakistan, but it

could not escape transformation. Its shape changed to such an extent that according to Rahman (1990), Pakistani English (PE) has become a separate independent variety of English like other varieties e.g. Indian English, African English, American English, etc. The main reason for this development is that after the departure of native speakers of English from the Subcontinent, there was no live model of spoken English in front of Pakistani learners to follow. In the early decades of its life, there was a scarcity of modern technology in Pakistan. So most of the Pakistani learners in public sector educational institutions did not have access to even recorded speech of native speakers of English. The non-native teachers of English spoke accented English. They produced next generations of English language teachers who further produced speakers of the same accented English in Pakistan. This cyclic process continued and the multiple increase of generations of speakers of the accented English culminated to the emergence of a variety of English namely PE which now claims its status among other varieties of English (Rahman, 1990). The PE has its own specific phonology. Almost simultaneously, Indian English (IE) also developed in the same way and was accepted as a variety of English (Ritchie & Bhatia, 1996). One of the prominent features of PE and IE is that both, unlike native British English, neutralise the contrast between aspirated and non-aspirated plosives of English.[1]

These days, in Pakistan, English is taught in schools right from the age of four when a child starts his/her formal education. However, it is the PE which is taught to Pakistani students in educational institutions run under the supervision of government of Pakistan. An interesting paradox starts when the Pakistani students, who want to specialise in English language and literature, reach universities/post-graduate colleges. At the post-graduate level, they

are taught phonology of British English in the Departments of English Language and Linguistics in Pakistani universities. In this way, Pakistani students start learning British English at the age of almost 19-20 years when they have already acquired a variety of English e.g. PE. However, we need to keep in mind that this situation prevails only in the public sector institutions of Pakistan. In the private sector educational institutions of high calibre, the scenario of teaching and learning English is amply different. The best quality private sector institutions of Pakistan where only the children of upper class of society can afford to study, follow the British or American English thoroughly. That is why different varieties of English are identified in Pakistan (Rahman, 1990). However, a majority of Pakistani learners do not have access to these quality educational institutions.

[1] See Rahman (1991) and (Mahboob & Ahmar, 2004) for a detailed study of PE and for IE see Gargesh (2004).

In other words, majority of the Pakistani learners of English have to learn PE till the age of around twenty.

As pointed out before, the development of PE is a consequence of the influence of indigenous languages of Pakistan. Pakistan is a multi-linguistic society in which a large number of languages belonging to three different families, namely Indo-Aryan, Indo-Iranian and Dravidian, are spoken. Saraiki is one of the major languages of Indo-Aryan family spoken in central areas of Pakistan (Shackle, 1976). It is also a language which is spoken as a mother tongue in all four provinces of Pakistan. In other words, it is a lingua franca in Pakistan. Along with its six-way phonemic contrast, (Syed, 2009, pp. 16-17), Saraiki has 9 oral and 8 nasal vowels and 49 consonants (Syed, 2013). Saraiki is a unique language in Pakistan for having implosive stops, breathy voiced sounds and oral-nasal contrast in stops on all places of articulations. In Pakistan, only Sindhi language shares these linguistic qualities with Saraiki. Strong and systematic nasalization is one of the main phonological features of Saraiki (Bahri, 1962, 1963). Saraiki has aspirated and unaspirated stops in its phonemic inventory. On the other hand, the same contrast is allophonic in English (Roca & Johnson, 2007). Keeping in view the existing theories of L1 interference in L2 acquisition, one can safely predict that Saraiki learners of English can acquire English aspiration contrast with effortless ease because they are already familiar with aspiration contrast in their mother tongue.

The current study focuses on advanced learners of English in Pakistan who speak Saraiki as their mother tongue. The paper is divided into seven sections. The next section provides a detailed comparison of consonantal phonemes of English and Saraiki. In this section, the existing differences between coronal stops in Saraiki and English will be highlighted. Section 2 is based on the theoretical background of the study in which an introduction of some popular models of second language acquisition is given. A brief introduction of voice onset time (VOT) is also given in this section. Section 3 includes research questions and section 4 gives a detail of the research methodology used for data collection and analysis in this study. The results are presented in section 5 and analyzed in detail in section 6. The chapter ends with conclusive remarks in section 7.

1. The context of the study

This study provides an acoustic analysis of English plosives produced by adult Saraiki learners of English. The purpose of the study is to determine whether Saraiki learners, maintain aspiration contrast in English plosives or not. For the purpose of comparison, consonantal phonemic inventories of English and Saraiki are given in tables 1 & 2.

Table 1: Consonantal inventory of English

	labial	dental	alveolar	Alveo-palatal	Velar	Glottal
Stop	p b		t d		k g	
Affricate				ʧ ʤ		
Fricative	f v	θ ð	s z	ʃ ʒ		h
Nasal	m		n		ŋ	
flaps/trill			r			
Liquids			l			
semi-vowel	w			j		

Table 2: Consonantal inventory of Saraiki[2]

	Voice	Aspiration[3]	Labial	Dental	Alveolar	Retroflex	Alveo-palatal	Velar	Glottal
Plosive	- - + +	- + - +	P pʰ b bʰ	t̪ t̪ʰ d̪ d̪ʰ		ʈ ʈʰ ɖ ɖʰ	c cʰ ɟ ɟʰ	k kʰ g gʰ	
Implosive			ɓ		ɗ		ʄ	ɠ	
Fricative	- +		f		s z		ʃ	x ɣ	ɦ
Nasal	+ +	- +	m mʰ		n nʰ	ɳ ɳʰ	ɲ ɲʰ	ŋ	
Flaps		- +			r rʰ	ɽ ɽʰ			
Lateral		- +			l lʰ				
Semi-Vowel		- +	ʋ ʋʰ				j		

[2] The phonemic inventory of Saraiki has been adapted from Shackle (1976) with some modifications.

A cursory view of the phonemic inventories of Saraiki and English reveals that the former is a rich language with as many as 49 consonants.[4] An important feature of Saraiki which is relevant to the current study is that it has aspirated and unaspirated plosives at phonemic level which English lacks. English has the same contrast but it is not phonemic. In English, the plosives are produced with longer aspiration duration if the sounds occur word-initially or in the onset of a stressed syllable but without strong aspiration if they occur in unstressed syllable word-medially or in s+stop clusters in words like 'stop' etc. (Spencer, 1996).

Besides obstruents, Saraiki also has a large number of plain and breathy voiced nasal and liquid consonants. Phonological processes like nasalization (Syed, 2009), palatalization and metathesis (Shackle, 1976) are also common in Saraiki. A major difference between the plosives of the two languages is that Saraiki has two consonants at the coronal place of articulation (Syed, 2012) whereas English has one at the same place. Thus vis-à-vis English alveolar [t d], Saraiki has retroflex [ʈ ɖ] and dental [t̪ d̪] stops. Another difference between Saraiki and English is that, corresponding to English affricates, Saraiki has stops at the same place of articulation (Varma, 1936). But the current study is only related to acoustic analysis of stops. Therefore, other differences and similarities between the two languages which are not relevant to this study are out of the scope of this paper.

2. The study of related literature

It is a common practice in second language research to analyse stops by studying their VOT values (Foulkes, Docherty, & Jones, 2010). Following the standard practice, the VOT of stops will be used as acoustic cues for analysis in this study. Therefore, a brief introduction of VOT is given in section 2.2. Before that, major predictions of some well-known models of second language like Feature Model (Brown, 1998), hereinafter FM, Perceptual Assimilation Model (Best, 1994, 1995), hereinafter PAM, and Speech Learning Model (Flege, 1995), hereinafter SLM, will also be briefly described in this section.

2.1. Models of second language acquisition

According to Brown (1998, 2000), if a feature which is required to differentiate two new L2 sounds is active in the L1 of adult learners, they may perceive and acquire the new contrast easily, but if the required feature which distinguishes the new L2 sounds is not active in the feature geometry of the L1, the L2 sounds will not be perceived and

[4] In Saraiki, breathy voiced alveolar implosive [ɗʱ]is also produced in words like [gʌɗʱã] 'donkey'. But this is the only word which has this sound. Perhaps, this sound disappeared from the phonemic inventory of Saraiki speakers. Another sound which also seems to have disappeared is breathy voiced velar implosive [ɠʱ]. An example of its existence is the word [aɠhã] 'ahead' in Multani dialect.

acquired by the learners. In other words, the L1 feature geometry filters the sounds of L2 according to the corresponding L1 features. In this way, FM differentiates between 'input' and 'intake'. According to the FM, input is what L2 learners hear but 'intake' is what their L1 phonological feature geometry allows them to perceive. The model concludes that *intake* matters in L2 acquisition (Brown, 1998, p. 139). The FM was developed on the basis of empirical studies by Brown with East Asian learners of English (1998). According to Brown (2000), factors like the time spent on learning a second language, nature of input or accessibility to the universal grammar play effective role in L2 learning *provided* the relevant feature required to differentiate a new sound pair is active in the L1 feature geometry. If the required feature is not active in the L1, new L2 sounds cannot be acquired. According to Larson-Hall (2004), the predictions of the FM are so far tested in the studies by Brown herself. The current study aims to extend the scope of the FM by testing its predictions in a novel context.

Perceptual Assimilation Model (Best, 1994, 1995; Best & Tyler, 2007) identifies directionality of difficulty in perception of L2 sounds. The model classifies L2 sounds into categories like TC, CG and SC type. The Two Category (TC) type of sounds are two L2 sounds which are perceived by L2 learners as 'gesturally similar' to two native sounds (Best, 1994, p. 191). The SC type of phonemes are those L2 sounds which are considered by L2 learners equally similar or discrepant' to one native sound of L1 (Best, 1994). In the Category Goodness (CG) type of L2 pair, one phoneme is perceived good exemplar than the other of the corresponding L1 sound (Best & Tyler, 2007). Sounds which L2 learners cannot map onto the L1 sounds are classed as 'non-speech sounds' in the PAM (Best, 1994). According to the PAM, TC is the easiest and SC the most difficult sound for L2 learners. Levy (2009) suggested further steps to refine PAM using some statistical measures. The findings of Best, McRoberts & Goodell (2001) substantiate the PAM with empirical evidence. The findings of the current study may also either substantiate or challenge the Perceptual Assimilation Model.

The Speech Learning Model (SLM), in the words of Flege (2003, p. 326) 'is the only extant theory that focuses explicitly on L2 speech acquisition. Flege develops seven hypotheses about various L2 contexts (1995, p. 239). The SLM classifies sounds of L2 into three categories namely 'identical', 'similar' and 'new'. Out of these three types of sounds the 'similar' ones are most difficult for L2 learners (Fox & McGory, 2007, p. 108). The SLM assumes L1 capacities remain effective throughout life. This stands in conflict with the Critical Period Hypothesis (hereinafter CPH) (Lenneberg, 1967; Patkowski, 1990; Scovel, 1988) which claims that the capability to acquire new L2 sounds terminates at the age of around thirteen years when a learner acquires puberty. The model claims that long exposure to L2 minimizes the blocking effect of the L1 grammar (Flege, 2003, p. 237). Contrary to the CPH, Flege claims that a phonetic shift

occurs at the age between five and seven which 'may render late learners less able to establish additional phonetic categories for sounds after the age of five to seven years' (Flege, 1992, p. 591). The CPH ascribes termination of ability to learn new sounds to neurological maturation (Scovel, 1988) but the SLM claims that the ability to learn an L2 sounds diminishes 'because the L1 phonetic system has developed and stabilized' (Flege, 1992, p. 591). An important prediction of the Speech Learning Model relevant to this study is that L2 learners are able to understand differences based on dialect or idiolect or vocal organs (Flege, 1992, pp. 593-594).

According to the Speech Learning Model, if two L2 sounds are similar to one L1 sound, 'the category formation may be blocked and that discrimination will be decreased between these sounds' (Frieda & Nozawa, 2007, p. 89). It is the same context which is categorized as the SC type in the PAM (Best, 1995). The SLM predicts that if a learner perceives some phonetic difference between two sounds, s/he may develop two separate phonetic representations for the two sounds in her/his L2 phonemic inventory.

We can contextualize the predictions of models of second language acquisition with the current study. According to FM (Brown, 1998, 2000), if the relevant feature is active in the L1 of learners, the L2 contrast may be acquired easily. In Saraiki, the feature [spread glottis] is active because Saraiki has aspirated and unaspirated plosives in its consonant inventory. In other words, the feature model predicts that Saraiki learners of English may not face any difficulty in acquisition of English aspiration contrast because corresponding to English aspirated and unaspirated stops, Saraiki also has similar stops in its phonemic inventory. In other words,

English aspirated and unaspirated stops make TC type of sounds for Saraiki learners. According to the PAM, such a pair of sounds are expected to be easier for Saraiki learners. And finally, the SLM predicts that if L2 learners perceive the sounds of L2 as different, they can acquire these sounds. Saraiki learners of English can easily discriminate between aspirated and unaspirated stops of English on account of positive transfer from the L1. Thus, the SLM also predicts learning of plosives for Saraiki learners of English. In the light of these predictions it is hypothesized that Saraiki learners of English may acquire English aspiration contrast easily. The current study aims to test this hypothesis.

2.2. Voice Onset Time (VOT)

Voice onset time, commonly known as VOT is the time interval between the burst of a stop and the onset of periodic voicing for the immediately following vowel (Docherty, 1992). It is assumed that the term was coined by Lisker & Abramson (1964). VOT is measured in milliseconds . Lisker and Abramson (1967) identify three types of VOT

ranges. First, if the vocal folds of a speaker start vibrating within approximately 30 milliseconds of the burst, this range is called short-lag VOT. Second, if the voicing of the following vowel starts longer than 30 milliseconds after the burst, such a VOT is called long-lag VOT. In some languages of the world, the periodic voicing starts before the burst. This is called pre-voicing and the VOT is described in negative values. Saraiki (Syed, 2013), Arabic (Flege & Port, 1981), Dutch (Simon, 2009, 2011), Spanish, (Flege & Eefting, 1988), Japanese (Nasukawa, 2010), French (Flege, 1987), etc. are languages with pre-voiced stops but languages like English (Honeybone, 2005), German (Hamann, 2011), Swedish, Korean, Icelandic (Backley, 2011), etc have phonologically voiced stops which are produced with short-lag VOT.

Factors like place of articulation and contact area between organs of speech influence VOT of plosives. A strong relationship between VOT and place of articulation has been identified in the previous research. The previous literature shows that VOT is inversely proportional to the distance between place of articulation of the stops and the vocal folds of a speaker (Lisker & Abramson, 1964) which means a closer distance between the point of articulation and the vocal folds yields a bigger VOT and vice versa. The reason for this is that if there is a smaller distance between the vocal folds and the point of blockage of the airstream, a relatively higher pressure is built up in the cavity which takes longer time in normalization of vocal folds. The vocal folds only start vibrating when they come to their normal position. Therefore, most of the studies on VOT show that compared with labial stops, dorsal stops have bigger VOT (Cho & Ladefoged, 1999). Another important factor which influences VOT is the contact area between active and passive articulators. The contact area of the articulators also determines the nature of VOT. The principle is that a bigger contact area between active and passive articulators yields a bigger VOT (Stevens, Keyser, & Kawasaki, 1986). The reason for this is that a larger contact area of articulators takes longer time in separation of the active articulator from the passive one as a result of which vocal folds also take longer in returning to their natural position. And vocal folds only start vibration when they are in their natural position. That is why compared with dorsal stops, coronal plosives have relatively smaller VOT. Although in most of the world languages direction of increase of VOT is from labial/coronal to dorsal, there are some exceptions to this generalization (Lisker & Abramson, 1964, Cho & Ladefoged, 1999, etc.)

Markedness differential hypothesis (Eckman, 1977) suggests that L2 learners acquire the marked sounds after they have acquired the unmarked ones. In the current study we shall also try testing this hypothesis by determining if the participants of this acquire accurate voice onset time for unmarked sounds before the marked ones? The current study will also determine if the direction of increase/decrease of VOT in the L2 phonemic inventory of Saraiki learners is in accordance with the previous findings.

2.3. Role of context in acquisition of L2 sounds

Previous studies show that the context in which a sound is produced influences the fluency and accuracy of speakers of a second language. The most frequently quoted example is the variant performance of L2 learners on production and perception of consonants of L2 on onset and coda position. The L2 literature confirms that L2 consonants are acquired on the onset position first and coda position later, because onset position is more unmarked than the coda position for certain L2 sounds (Archibald, 1998).

Similarly, rate of speech and context of the target sound in a word also matter in L2 acquisition.

Birdsong (2007) attempted to know if adult learners can attain native-like accuracy of speech in a second language. For this purpose, seven male and fifteen female American learners of French were taken as a sample of study. A number of seventeen native speakers of French (ten males and seven females) were also selected as a control group. The purpose of this experiment was to study the acquisition of four French vowels namely [e], [i], [o] and [u] and VOT of [p], [t] and [k] by the learners. The participants produced 21 words carrying the target sounds; 12 of the target words had the target vowels and nine the target consonants. Twenty two control items were also included in the list of stimuli. The participants were asked to read the stimuli in continuous sentences and exclusively in words. For continuous speech production, three paragraphs were read by the participants. Out of the three paragraphs, two were selected for analysis. The stimuli were also produced as exclusive words. Both types of stimuli i.e. those in sentences and exclusive words, were read by both groups of participants. The productions were recorded and the target words embedded in the sentences elicited from the sentences. The recordings of the native and non-native speakers were mixed and randomized, and presented for evaluation to three native speakers of French who were teachers of English in the USA. The native French teachers in the USA were selected with a view that they may identify even the slightest L1 accent in the participants' productions on the basis of their experience of listening to French by Americans. The results show that those participants who were better in production of the target sounds in the continuous speech were equally better in the production of the same sounds in isolated words. But on the other hand, all those participants who performed better in the production of the target sounds in isolated words were not equally better in production of the same sounds in continuous speech. On the basis of these findings, the author concludes that there is unidirectional relationship between competence in continuous speech and segmental production, in that, better production in the former context implies the same in the latter but not vice versa.

The current study also takes into account the role of context in acquisition of VOT of English stops by adult Saraiki learners at segmental and global level.

3. Research questions

The current study attempts to answer the following questions;

1. Does context influence acquisition of VOT of English stops by adult L2 learners?
2. Does place of articulation influence acquisition of VOT plosives by L2 learners?
3. Do L1 (Saraiki) phonemic contrast facilitate or resist L2 (English) allophonic contrast?

4. Data collection and tools of research

A group of 34 students of MA English language and literature from 3 postgraduate colleges of Southern Punjab participated in this study. The homogeneity of the participants were strictly controlled. All participants were selected from similar type of educational institutions. In Pakistani society, we have various types of educational institutions like religious schools, privately run English medium institutions and public sector government colleges (Rahman, 2003). The participants were selected from government post-graduate colleges on the basis of availability and convenience sampling. All participants were studying in MA final at the time of experiment. All of them speak Saraiki as L1. Before recording, the students were asked to fill a questionnaire which had questions about linguistic and educational background of the participants. The following table provides summary of some of the information elicited through the questionnaire.

Table 3: Detail of the participants

Factors	Minimum	Maximum	Mean	Std. Dev.
Age in years	19.00	27.00	22.28	2.55
Speaking English (hours/day)	1.00	05.00	02.03	1.21
Listening L2 from non-natives (hours/day)	1.00	08.00	02.79	1.61
Listening L2 by native speakers (hours/day)	.00	06.00	.90	1.23

Table 3 shows that the participants speak English for an average of approximately 2 hours daily. They listen to non-native English for two to three hours. On average, they listen to English spoken by native speakers for less than an hour daily. In response to a question they informed that none of them had visited an English speaking country. They were all students of linguistics and were taught phonology of British English at the

Departments where they were studying. Thus, they were familiar with the basics of the phonology of British English. None of the participants had any speaking or listening disorder.

Before recording, the participants were requested to grant a written permission to the researcher to record their voices and use for research purpose maintaining anonymity of the speakers. The stimuli consisted of some distracters and the target words of English, namely 'peak, speak, teeth, steal, key, ski'. Each of the target words was written thrice in the list in a random order. The stimuli list had two sets, words and sentences. In the list of sentences, actually one carrier sentence was repeated with the target words embedded in it. The carrier sentence was 'I say …….again'. So, each of the words was spoken in the carrier sentence three times and in isolation three times. The participants were requested to read the stimuli in normal speech. The details of the experiment were explained to the participants in advance in Saraiki by the researcher who is also a native speaker of Saraiki. However, the purpose of the experiment was not explained to them.The recordings were completed in the campuses of the post-graduate colleges where the students were studying. Permission for conducting the experiment in the campus was also obtained from the competent authorities.

The target words which were embedded in the carrier sentences were elicited and the VOTs of stops produced by the participants in isolated words and in carrier sentences were taken using Praat (Boersma & Weenink, 2012). Since there were six (three in words and three in sentences) repetitions of each of the target sounds, a Cronbach's alpha reliability test was applied on the repetitions to confirm the consistency of the participants' productions.[5] The reliability in the repetitions ranged between 51% and 78%.

Normally, a Cronbach's alpha value of 0.6 or 60% consistency is taken as a cut-off point of reliability by statisticians (Hair, Anderson, Tatham, & William, 2006, p. 118; Jones, James, Hornick, & Sells, 1979, p. 215) and linguists (Ghenghesh, 2010, p. 131; Scholfield, 1995, p. 206; Tseng, Dörnyei, & Schmidt, 2006, p. 93). However, the results in table 4 show that reliability in two cases does not reach the cutoff point which implies inconsistency of the speakers in their productions.

[5] In principle, the reliability test should be applied on the VOTs of stops in exclusive words and sentences separately. Since there is no significant difference between the VOTs of stops obtained in the exclusive words and the carrier sentences (as the later analysis shows), and the VOTs obtained both contexts is averaged for further analysis, so the reliability test is run on the combined data.

Table 4: Reliability/consistency in repetitions

Sound	Cronbach's alpha	Percent consistency
[p^h]	0.74	74
[p]	0.59	59
[t^h]	0.78	78
[t]	0.64	64
[k^h]	0.51	51
[k]	0.68	68

5. Presentation of data

Out of the total 34 participants, the recordings of five participants were discarded due to technical reasons. The VOTs of the remaining 29 students are described in this section. The data are presented according to the research questions. A paired-sample t-test on the VOT values obtained in isolated words and carrier sentences confirms that there is no significant ($p>.1$) effect of the context on four of the target sounds [p p^h t^h k]. But the VOT of non-aspirated coronal [t] ($t=-2.07$, $p<.05$) and aspirated dorsal [k^h] ($t=2.39$, $p<.03$) are significantly different in the two contexts i.e. in isolated words and in the carrier sentence. Since the VOTs of [t] and [k^h] are significantly different in the two contexts, the following table shows the details of VOTs of these two sounds.

Table 5: VOTs obtained in words and sentences

Sounds	Context	Minimum	Maximum	Mean	Std. Deviation
[t]	Words	8.67	26.67	18.85	4.80
	Sentences	4.67	51.67	22.52	10.27
[k^h]	Wrods	10.67	61.67	37.47	10.08
	Sentences	.00	53.33	30.54	12.04

Table 5 shows that the VOT of [t] is bigger in continuous sentences than in isolated words but that of [k^h] is smaller in the sentences. No generalization about the influence of the context on VOT can be developed from these results. Since the VOTs of most of the consonants is not different in two contexts, the VOTs of stops (including those of [t] and [k^h]) are cumulated and an average is taken for further analysis. The following table shows the average VOTs.

Table 6: Voice onset time for English plosives

Sounds	Minimum	Maximum	Mean	Std. Deviation
[p^h]	.00	21.50	07.89	5.98
[t^h]	05.83	33.00	14.73	6.82
[k^h]	18.17	47.33	34.01	7.91
[P]	.00	24.67	09.59	5.99
[t]	10.50	37.00	20.68	6.45
[k]	09.67	42.17	25.05	7.19

A repeated measures ANOVA confirms a significant ($F = 150.618$, $p < .001$) effect of place of articulation but an overall non-significant ($p > .1$) effect of aspiration contrast on VOTs. The interaction between place of articulation and aspiration is also significant ($F = 78.259$, $p > .001$). Since, the overall effect of aspiration on VOTs is non-significant, each pair of aspirated and unaspirated stops was compared separately. The results of a series of paired-sample t-tests confirm that the VOTs of the aspirated and non-aspirated plosives are significantly different in case of /t/ ($t = -4.08$, $p < .001$) and /k/ ($t = 6.69$, $p < .001$) but non-significant in case of /p/ ($p > .1$). These results are analyzed and discussed in the following section.

6. Analysis and discussion

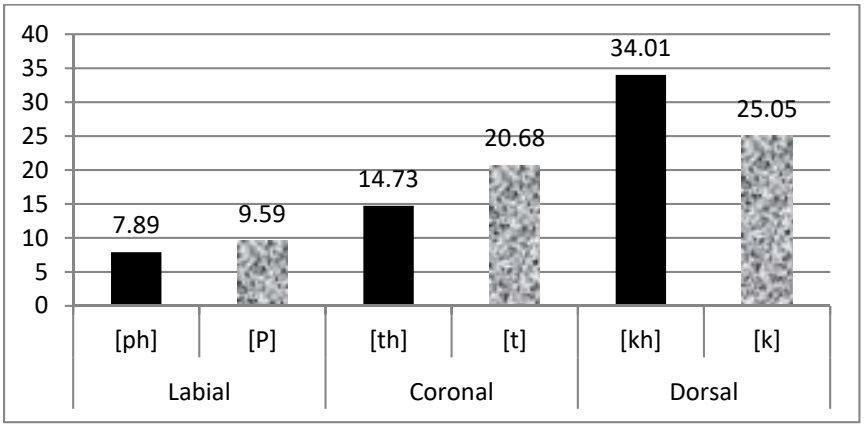
One of the research questions was to determine the effect of place of articulation on VOT of plosives by L2 learners. The results indicate that the VOT of the learners is increasing from labial to coronal to dorsal place in both aspirated and unaspirated plosives.

Lisker and Abramson (1964) claim that a longer distance of vocal folds from the place of articulation yields smaller VOT and vice versa. The results are in accordance with this. Thus, the direction of increase of VOT for plosives in the L2 phonemic inventory of the Saraiki students is according to the world trends as long as the relationship between VOT and place of articulation is concerned. According to another theory, a bigger contact area between active and passive articulators yields a bigger VOT. From this point of view, velar stops should yield the highest and coronal ones the lowest VOTs. But we have to keep in mind that some previous studies (Lisker and Abramson, 1964; Cho and Ladefoged, 1999 etc.) show that world-languages have a direction of increase from labial to coronal to velar. This means the effect of distance is stronger than that of the contact area. The increase in the VOTs of Saraiki learners is also in the same direction.

Another research question was whether Saraiki learners of English transfer their L1 aspiration contrast to L2 allophonic contrast in acquisition of English plosives. The results show that there is a significant difference between the VOTs of the students in aspirated and unaspirated coronal and dorsal stops of English ($p < .05$). These results

confirm that the learners have separate ranges for aspirated and unaspirated allophones of coronal and velar stops. Figure 1 illustrates this.

Figure 1: Voice onset time for English plosives



In figure 1, the solid bar reflects the VOTs of aspirated stops. Statistical analyses verify that there is no significant ($p>.1$) difference between aspirated and unaspirated allophones of the labials produced by the participants. But the learners produced /t/ in the word 'steal' with a mean VOT of 20.68 ms but that in the word 'teeth' with a mean VOT of 14.73 ms. The mean difference is also highly significant ($p<.001$). It means Saraiki learners produce English /t/ in 's+t' cluster with a bigger VOT but that on word-initial position in the words like 'teeth' with relatively smaller VOT. This is reverse of what native speakers do. To find out the reason for this, we need to analyze the real nature of these sounds in Saraiki and English to find out the motivation for the specific unexpected behaviour of the Saraiki learners in production of English /t/. The phonemic inventories of English and Saraiki show that Saraiki, like most of the of Indo-Aryan languages of the Sub-continent (see Cardona & Jain (2007) for phonemic inventories of the Indo-Aryan family of languages spoken in Pakistan, Bangladesh and India) has two stops at coronal position namely dental and retroflex. Other Pakistani languages like Balochi, Pashto and Brahvi also have dental and retroflex stops on coronal place (Elfenbein, 1997a, 1997b, 1997c). The previous research (e.g. Rahman 1990, 1991; Mahboob and Ahmar, 2004, etc.) shows that Pakistani learners of English substitute English dental fricatives with the dental stops of their L1s in English loanwords and in the PE. Therefore, English coronal stops /t d/ being alveolar are substituted with retroflex by Pakistani learners including those who speak Saraiki as mother tongue. Another important phenomenon is that s+stop clusters are illegitimate in Saraiki. Among 's+stop' clusters the 's+t' poses maximum difficulty because of progressive spreading/assimilation of the place of articulation of 's'.

Since English [t] is produced as retroflex by Saraiki learners, the production of 'st' cluster requires operation of two opposite gestures simultaneously. The production of retroflex stop (i.e. 't') demands the tongue tip to curl back but the preceding ‘s’ demands a forward movement of the tip of the tongue. This is because, in the language of feature geometry (Clements & Hume, 1995), /s/ is [+anterior] and the following retroflex 't' is [- anterior] or posterior in the 'st' clusters of Pakistani English. Realization of two opposite operations of tongue are incompatible for a speaker. Consequently, Saraiki learners assimilate the place of articulation and, instead of curling back their tongue to produce a retroflex 't', produce English 't' in 'st' clusters as an alveolar stop. Since there is no such constraint operative in the production of 't' in word-initial position in words like 'teeth', the learners produce English /t/ as retroflex in this position but as alveolar (native-like) in clusters in the words like ‘steal’. The previous studies confirm that retroflex stops have normally smaller VOT than alveolar stops (Steriade, 2001, pp. 224-225). This is why the participants of this study produced word-initial /t/ in ‘teeth’ with smaller VOT but that in the stimulus ‘steal’ with a bigger VOT unintentionally. Besides, it is also observed that production of a retroflex sound immediately followed by a high vowel is articulatorily very difficult (Flemming, 2010, p. 11). In the stimulus 'steal' 't' is also immediately followed by a high tense vowel. Therefore, the production of 't' in the word 'steal' with longer VOT is due to phonetic and articulatory reasons, not because of learning.

Having a look at the results, we can realize that there is some learning in the participants in acquisition of voice onset time for English velar stops. This means that the participants have only acquired near native-like[6] accuracy in velar stops. But there is no learning observed in the participants in acquisition of labial and coronal stops. We summarise the findings at this stage. First, the place of articulation has a significant effect on the VOT of learners and the pattern of effect is in accordance with the attested world-trends. The effect of context on VOT is non-significant in some cases but significant in others. The participants only succeeded to acquire VOT of velar stops.

The main research question was whether L1 phonemic contrast facilitates or resists the acquisition of L2 allophonic contrast? The results elucidate that the participants could not acquire the accurate VOT for aspirated and unaspirated allophones of English coronal and labial plosives. According to the perceptual assimilation model (Best 1994, 1995) English stops are the Two Category type of sounds for Saraiki learners. The PAM predicts that this contrast should be easier to acquire for Saraiki learners. From the FM

[6] We avoid using the phrase 'native-like accuracy' because the two different ranges of VOTs for aspirated and unaspirated allophones of English velar phoneme, though significantly different from each other, are not quite native-like. For a comparison of VOTs of the participants with those of native speakers of English, see Docherty (1992).

point of view (Brown 1998, 2000), the participants of this study should also acquire English aspiration contrast because the feature [spread glottis] required for differentiating the members of the pair is active in Saraiki. Similarly, according to the speech learning model (Flege, 1995), the L2 learners can easily perceive the difference between aspirated and unaspirated allophones of English plosive on account of positive transfer from the L1 and develop separate phonetic categories for the target sounds. The SLM also claims that learners perceive L2 sounds at phonetic rather than more abstract phonemic level. But the results show that the participants are unable to perceive the phonetic contrast in English and acquire it thoroughly. What is the reason that the results of this study do not fit into the predictions of any of the models of second language acquisition? Is it because the predictions of the FM are about phonemic contrast and the target contrast is allophonic in the current context? If so, we need to develop predictions about acquisition of allophonic contrast in L2. There is a vast literature on acquisition of L2 phonemes but very small number of studies on acquisition of allophonic variance of L2. But the SLM predicts about this context because it is not centred on abstract phonemic perception; rather it is centred on concrete allophonic perception (Flege 1995, p. 239). But the findings of this study are also asymmetrical to the predictions of the SLM. The SLM predicts that L2 learners can perceive and produce allophonic variance of L2 phonemes (Kato, 2005) but the results show the converse.

The reason for this lies in the historical development of English in Pakistan. English was brought to the sub-continent by the East India Company in 17th century CE (Baumgardener, 1993). The people of Pakistan inherited educational and governmental system from the British. They could not help continuing with the existing system at the time of independence. Thus, English remained official language of Pakistan and media of instruction, learning, formal communication and journalism. But there were no native speakers to teach English to Pakistanis. Thus, teaching-learning of English occurred through reading writing only for the next six decades. Consequently, a variety of English emerged in Pakistan which is now called Pakistani English (PE) (Rahman, 1990). The PE does not maintain the aspiration contrast in the variants of English plosives. One of the main reasons for this is that English orthography also does not maintain this contrast. Thus, we ascribe inability of Saraiki speakers (like other Pakistani learners) to acquire English aspiration contrast to orthography and absence of native model in front of the learners. The influence of orthography on acquisition of a second language is established in the literature (Hayes-Harb et al., 2010; LaCharite & Paradis, 2005, pp. 251-253).

A possible objection to this analysis may be that the participants of this study are students of MA English and they are taught phonology of British English in the class. How can they be unfamiliar with the native speech. The answer to this question is that as the participants themselves reported in the questionnaire, they do not listen to native English

for significantly long time regularly. Besides, teaching British English phonology means teaching *about* language not listening to the native speech. In Pakistan, English is taught as a subject of study not as a language. Besides, if the advanced Saraiki learners get any understanding of the British English, this understanding does not accrue any benefit to them in development of new phonetic categories for English sounds because for early 14 years they had been learning to PE before starting reading about the British English phonology in MA English classes. Thus they had already developed a strong phonemic inventory of PE when they started reading about British English. The findings of this study demonstrate that an already acquired variety of an L2 (PE) strongly resists acquisition of another variety of the same L2 (British English) in the same way as an already acquired L1 does in acquisition of a second language in adult age. This may be a potential research question for future studies.

7. Conclusion

The current study was based on the acquisition of VOT by advanced Pakistani learners of English. The L1 of the learners has aspiration contrast at phonemic level. But the learners failed to transfer the L1 VOT ranges to the allophones of English. The study poses a possible challenge to the speech learning model (Flege 1995) which claims that the learners relate the sounds of L1 and L2 at allophonic level. The possible reason for this is that the L2 contrast is allophonic but the L1 contrast is phonemic. The orthography and Pakistani English are other reasons for this. The direction of increase in the VOT of the learners is from labial to coronal to dorsal. A little learning was observed only in the acquisition of velar stops by the learners. The effect of the context does not seem to be so strong on the VOT of the learners because the learning process is blocked. It is important that although the participants of this study are students of post-graduate level but they have no direct access to native speech. The study may be replicated with advanced Pakistani learners who have direct access to the native English speech to determine if the L1 aspiration contrast which is phonemic, primes into the English aspiration contrast at allophonic level. This is another potential project for future research.

References

Archibald, J. (1998). *Second language phonology* (Vol. 17). Amsterdam/Philadelphia: John Benjamins Publishing Company.

Backley, P. (2011). *An introduction to element theory*. Edinburgh: Edinburgh University Press.

Bahri, H. (1962). *Lahndi Phonology :with special reference to Awanki*. Allahabad (India): Bharati Press Prakashan.

Bahri, H. (1963). *Lahndi Phonetics :with special reference to Awanki*. Allahabad (India): Bharati Press Prakashan.

Baumgardener, J. A. (1993). *The English Language in Pakistan*. Karachi: Oxford University Press.

Best, C. T. (1994). The emergence of native-language phonological influences in infants: A perceptual assimilation model. In C. Goodman & H. Nasbaum (Eds.), *The development of speech perception: The transition from speech sounds to spoken words* (pp. 167-224). Cambridge MA: MIT Press.

Best, C. T. (1995). A direct realist view of cross-language speech perception. In W. Strange (Ed.), *Speech perception and linguistic experience: Issues in cross-language research* (pp. 171-204). Timonium MD: York Press.

Best, C. T., McRoberts, G. W., & Goodell, E. (2001). Discrimination of non-native consonant contrasts varying in perceptual assimilation to the listener's native phonological system. *The Journal of the Acoustical Society of America, 109*(2), 775-794.

Best, C. T., & Tyler, M. D. (2007). Nonnative and second-language speech perception: Commonalities and complementarities. In O.-S. Bohn & M. J. Munro (Eds.), *Language experience in second language speech learning: In honor of James Emile Flege.* (pp. 13-34). Amsterdam: J. Benjamins.

Birdsong, D. (2007). Nativelike pronunciation among late learners of French as a second language. In O.-S. Bohn & M. J. Munro (Eds.), *Language experience in second language speech learning* (pp. 99-116). Amsterdam: John Benjamins.

Boersma, P., & Weenink, D. (2012). Praat: doing phonetics by computer.

Brown, C. A. (1998). The role of the L1 grammar in the L2 acquisition of segmental structure. *Second Language Research, 14*(2), 136-193.

Brown, C. A. (2000). The interrelation between speech perception and phonological acquisition from infant to adult. In J. Archibald (Ed.), *Second language acquisition and linguistic theory* (pp. 4-63). Malden Mass: Blackwell.

Cardona, G., Jain, D., & (2007). *The Indo-Aryan Languages*. London: Routledge.

Cho, T., & Ladefoged, P. (1999). Variation and universals in VOT: evidence from 18 languages. *Journal of Phonetics, 27*(2), 207-229.

Clements, G. N., & Hume, E. V. (1995). The internal organization of speech sounds. In J. Goldsmith (Ed.), *A handbook of phonological theory* (pp. 245-306). Oxford: Blackwell.

Davenport, M., & Hannahs, S. J. (2010). *Introducing Phonetics and Phonology* (3 ed.). London: Hodder Education.

Docherty, G. J. (1992). *The timing of voicing in British English obstruents*. Berlin: Foris publications.

Eckman, F. R. (1977). Markedness and the contrastive analysis hypothesis. *Language learning, 27*(2), 315-330.

Elfenbein, J. (1997a). Balochi Phonology. *Phonologies of Asia and Africa 2*, 761-776.

Elfenbein, J. (1997b). Brahui Phonology. *Phonologies of Asia and Africa, 2*, 797-811.

Elfenbein, J. (1997c). Pashto Phonology. *Phonologies of Asia and Africa 2*, 733-759.

Flege, J. E. (1987). The production of 'new' and 'similar' phones in foreign language: evidence for the effect of equivalence classification. *Journal of Phonetics 15*, 47-65.

Flege, J. E. (1992). Speech learning in a second language. In C. Ferguson, L. Menn & C. Stoel-Gammon (Eds.), *Phonological development: Models, research, implications* (pp. 565-604). Timonium, MD: York press.

Flege, J. E. (1995). Second language speech learning: Theory, findings, and problems. In W. Strange (Ed.), *Speech perception and linguistic experience: Issues in cross-language research* (pp. 233-277). New York: Timonium, MD.

Flege, J. E. (2003). Assessing constraints on second-language segmental production and perception. In N. O. Schiller & A. S. Meyer (Eds.), *Phonetics and phonology in language*
comprehension and production: Differences and similarities (pp. 319-355). Berlin/New York: Mouton de Gruyter.

Flege, J. E., & Eefting, W. (1988). Imitation of a VOT continuum by native speakers of English and Spanish: Evidence for phonetic category formation. *Journal of the Acoustical Society of America, 83*(2), 729-740.

Flege, J. E., & Port, R. (1981). Cross-language phonetic interference: Arabic to English. *Language & Speech, 24*(2), 125-146.

Flemming, E. S. (2010). *Auditory Representation in Phonology*. London/New York: Routledge.

Foulkes, P., Docherty, G., & Jones, M. J. (2010). Analyzing Stop. In F. P, D. G. J & J. M. J (Eds.), *Sociophonetics: a student's guide* (pp. 58-71). London: Routledge.

Fox, R. A., & McGory, J. T. (2007). Second language acquisition of a regional dialect of American English by native Japanese speakers. In O.-S. Bohn & M. J. Munro (Eds.), *Language experience in second language speech learning: In honor of James Emil Flege* (pp. 117-134). Amsterdam: John Benjamins.

Frieda, E. M., & Nozawa, T. (2007). You are what you eat phonetically. In O.-S. Bohn & M. J. Munro (Eds.), *Language experience in second language speech learning: In honor of James Emil Flege.* (pp. 79-96). Amsterdam: John Benjamins.

Gargesh, R. (2004). Indian English: Phonology. In B. Kortmann (Ed.), *A Handbook of Varieties of English* (pp. 815-829). Oxford: Blackwell.

Ghenghesh, P. (2010). The Motivation of L2 Learners: Does it decrease with age? *English Language Teaching, 3*(1), 128-141.

Hair, J. F., Anderson, R. E., Tatham, R. L., & William, C. (2006). *Multivariate data analysis*: Upper Saddle River, NJ: Prentice Hall.

Hamann, S. (2011). Phonetics-phonology interface. In N. C. Kula, B. Botma & K. Nasukawa (Eds.), *The continuum companion to phonology* (pp. 202-224). London: Continuum international publishing group.

Hayes-Harb, R., Nicol, J., & Barker, J. (2010). Learning the phonological forms of new words: effects of orthographic and auditory input. *Language & Speech, 53*(3), 367-381.

Honeybone, P. (2005). *Diachronic evidence in segmental phonology: The case of laryngeal specifications*. Berlin: Mouton de Gruyter.

Jones, A. P., James, L. R., Hornick, C., & Sells, S. (1979). Psychological climate: Dimensions and relationships of individual and aggregated work environment perceptions. *Organizational Behavior and Human Performance, 23*(2), 201-250.

Kato, K. (2005). *Second language (L2) segmental learning: Perception and production of L2 English by Japanese native speakers.* PhD, University of Essex, Colchester.

LaCharite, D., & Paradis, C. (2005). Category Preservation and Proximity versus Phonetic Approximation in Loanword Adaptation. *Linguistic Inquiry, 36*(2), 223–258.

Larson-Hall, J. (2004). Predicting perceptual success with segments: a test of Japanese speakers of Russian. *Second Language Research, 20*(1), 33-76.

Lenneberg, E. (1967). *Biological foundations of language*. New York: Wiley.

Levy, E. S. (2009). On the assimilation-discrimination relationship in American English adults' French vowel learning. *Journal of the Acoustical Society of America, 126*(5), 2670-2682.

Lisker, L., & Abramson, A. (1967). Some effects of context on voice onset time in English stops. *Language and Speech, 10*, 1-28.

Lisker, L., & Abramson, A. S. (1964). A cross-language study of voicing in initial stops: acoustical measurements. *Word, 20*(3), 384-422.

Mahboob, A., & Ahmar, N. H. (2004). Pakistani English: Phonology. In E. W. Schneider (Ed.), *A Handbook of Varieties of English: A Multimedia Reference Tool* (pp. 1003-1015). Berlin: Mouton de Gruyter.

Nasukawa, K. (2010). Place-Dependent VOT in L2 Acquisition. In M. T. P. e. al (Ed.), *Selected Proceedings of the 2008 Second Language Research Forum* (pp. 198-210). Somerville: Cascadilla Proceedings Project.

Patkowski, M. S. (1990). Age and Accent in a Second Language: A Reply to James Emil Flege *Applied Linguistics, 11*(1), 73-89.

Rahman, T. (1990). *Pakistani English: The linguistic description of a non-native variety of English*. Islamabad: National Institute of Pakistan Studies, Quaid-i-Azam University.

Rahman, T. (1991). Pakistani English: some phonological and phonetic features. *World Englishes, 10*(1), 83-95.

Rahman, T. (1996). *Language and politics in Pakistan*. Karachi: Oxford University Press.

Rahman, T. (2003). *Language Education and Culture*. Karachi (Pakistan): Oxford University Press.

Ritchie, W. C., & Bhatia, T. K. (1996). *Handbook of second language acquisition*. San Diego: Academic Press.

Roca, I., & Johnson, W. (2007). *A course in phonology*. Oxford: Blackwell.

Scholfield, P. (1995). *Quantifying language: A researcher's and teacher's guide to gathering language data and reducing it to figures*. Clevendon/Philadelphia: Multilingual Matters Ltd.

Scovel, T. (1988). *A time to speak: A psycholinguistic inquiry into the critical period for human speech*. Cambridge: Newbury House

Shackle, C. (1976). *The Siraiki language of central Pakistan: A reference grammar*. London: University of London School of Oriental and African Studies.

Simon, E. (2009). Acquiring a new second language contrast: an analysis of the English laryngeal system of first language Dutch speakers. *Second Language Research, 25*(3), 377-408.

Simon, E. (2011). Laryngeal stop systems in contact: Connecting present-day acquisition findings and historical contact hypotheses. *Diachronica, 28*(2), 225-254.

Spencer, A. (1996). *Phonology : theory and description* Oxford: Blackwell.

Steriade, D. (2001). Directional asymmetries in place assimilation. In E. Hume & K. Johnson (Eds.), *The role of speech perception in phonology* (pp. 219-250). London: Academic Press.

Stevens, K. N., Keyser, S. J., & Kawasaki, H. (1986). Toward a Phonetic and Phonological Theory of Redundant Features. In J. S. Perkell & D. H. Klatt (Eds.), *Invariance and variability in speech processes* (pp. 426-463). New Jersey: Lawrence Earlbaum Associates.

Syed, N. A. (2009). *Nasalization in Saraiki*. MA, University of Essex. Retrieved from http://www.essex.ac.uk/linguistics/dissertations/2009/docs/Syed.pdf

Syed, N. A. (2012). Perception and production of English [d] by Pakistani L2 learners. *Essex Graduate Students Papers in Language and Linguistics, University of Essex, 13*, 134-157.

Syed, N. A. (2013). Voice onset time for plosives in Saraiki: Implications for the acquisition of English aspiration contrast. *EFL Annual Research Journal 2012 Shah Abdul Latif University Khairpur, 14*, 1-15.

Tseng, W. T., Dörnyei, Z., & Schmidt, N. (2006). A new approach to assessing strategic learning: The case of self-regulation in vocabulary acquisition. *Applied Linguistics, 27*(1), 78-102.

Varma, S. (1936). The Phonetics of Lahnda. *Journal of Royal Asiatic Society of Bengal 2*, 47-118.