



-PHONOLOGICAL INTERFERENCE OF L1 PUNJABI ON- ENGLISH VOWEL PRODUCTION: A CASE STUDY OF FEMALE PRIMARY STUDENTS IN RENALA KHURD

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Abstract

The aim of the study is to investigate the phonological interference of Punjabi (L1) on English vowel productions among female primary school students of Renala Khurd, Pakistan. The main goal is to detect the patterns of mispronunciation of vowels and for the analysis of the effect of the phonological system of Punjabi on the production of English speech in an early stage of acquiring English. The population under study was the total number of female primary students in all public primary schools of Renala Khurd and a sample of 500 students was taken from the population by stratified random sampling of students in different grade levels. A quantitative case study approach was used, and data were gathered via structured reading tasks such as word lists and sentences based pronunciation tasks on the important English vowel sounds. The participants' speech was audio-recorded and subsequently transcribed and analysed both phonetically and statistically, to find out the patterns of errors that occurred. The results show that there were a number of instances of epenthesis, vowel length confusion, and vowel substitution, mostly as a result of the disparity between the vowel inventories of the two languages, Punjabi and English. Especially, the English vowels /æ/, /ʌ/, and /ɜ:/ were often substituted by the nearest vowel sound in the Punjabi language. The study finds that among young learners, L1 Punjabi has a strong and systematic influence on the production of English vowels, which can be predicted to cause pronunciation problems. This indicates the urgent need for early phonological awareness training and pronunciation teaching in English language teaching in the primary school. The study has a contribution to the existing body of knowledge in the sense of giving a large scale, context specific evidence from the semi-urban setting of Pakistan.

Keywords: *English Vowels, ESL Learners, Pakistan, Phonological Interference, Primary Education, Punjabi.*

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1. Introduction

Learning a language is not a neutral or isolated activity; rather, it is a language learning activity that is very much influenced by what is already learned. Children who are beginning to learn another language begin with a well-established language system or system of systems from their first language (L1). This is an existing system that will be a resource and a barrier. There is greater influence from the mother tongue in multilingual situations like in the case of Pakistan where English is a second language from the early school years and the impact of this language is very strong and cannot be avoided. The most noticeable place this comes through is in pronunciation, particularly in the production of vowels. The present study is aimed to examine interference of Punjabi on the performance of English vowels in the context of female primary school children of Renala Khurd.

Pakistan is a linguistic landscape with a number of regional languages in addition to Urdu and English. In these languages, Punjabi is the most widely used language particularly in Punjab. For many children in semi-urban and rural region Punjabi is the main language of communication in their home and street life. English is, however, taught at primary level as a subject – and sometimes as a medium of instruction. This makes it difficult for young learners to learn a language that is structurally and phonologically distinct from their first language, but gives them limited exposure and support. What you get, is not only problems with the knowledge of vocabulary or grammar, but much more you get problems with the production of sounds that do not exist in your L1.

Losing the sound system of a learner's first language has been captured as "phonological interference" or "negative transfer," a phenomenon that occurs when the sound system of the learner's first language helps to shape his or her representation of sounds in his or her second. This is a systematic process and not random. Learners often replace unfamiliar sounds with those that they can get close to in their native phonological system. The vowels in Punjabi and English are different and that difference poses predictable challenges for the Punjabi-speaking learner. English has a large number and complex set of vowels, which vary in vowel length, tongue position, and centralization. Punjabi, in contrast, has a different set of vowels, its own set of length and nasalization contrasts, but

lacks some vowel contrasts in English. Learners tend to use the local equivalents to English vowels, thus making some mistakes in pronunciation.

The situation becomes even more important at the primary school level where the basic language skills are being developed. Learners at this stage are very receptive but can also assimilate wrong pronunciation patterns if not accompanied by a proper guidance. These patterns tend to get entrenched once they are formed and are hard to change in subsequent stages of learning. Yet, pronunciation and especially phonology is one of the most underemphasized areas in the teaching of English in many classrooms in Pakistan. Spoken accuracy is neglected or dealt with briefly, while reading and writing skills are emphasized. This disbalance helps to maintain phonological errors in the learners.

Of this scope, the production of vowels is a point that must be considered as a problem. Vowels are more subtle than consonants, which tend to have more distinct articulatory features, and must be shaped and positioned with precision to be articulated correctly. There is no exact equivalent for the English vowels /æ/ (cat), /ʌ/ (cup), and /ɜ:/ (bird) in the Punjabi language. So often learners substitute it with the more familiar sounds such as /a/ or /ə/. This replacement has many implications, including intelligibility, and may result in communication misunderstandings. For instance, mixing up the pronunciation of vowel sounds may alter the meaning of words completely and this is an impediment to effective language use.

Another confusable feature among the learners in the group of Punjabi speakers is the confusion of the length of vowels. Both Punjabi and English distinguish between short and long vowels, but the rules for the distinction are not the same in the two languages. When learners speak English, they tend to overgeneralize the pattern of vowel length in Punjabi and produce either increased or decreased vowel length in correct and incorrect contexts. Also, extra vowel sounds (epenthesis) are often inserted at words containing consonant clusters which are not allowed in the Punjabi phonology. There are also words that seem to be parallel to the English ones but have been adapted to Punjabi pronunciation, such as sakool (school).

The difficulty that makes this more complex is that it is not only linguistic, it's also educational and social. There are few resources available in public schools, particularly in semi-urban areas such as Renala Khurd, for the learning of pronunciation. Teachers might not have a formal training in phonetics/phonology, and teaching practices might be more rote learning based rather than interactive or auditory based. Furthermore, the students are not exposed to native or standard pronunciation of English in the classroom very much. L1-influenced speech patterns are also reinforced through media exposure, peer interaction and community language practices. Learners, therefore, work in a context where errors in pronunciation are accepted as the norm rather than being corrected.

This study is focussed specifically on female primary students and is not incidental. Gender is a factor in the educational experiences and opportunities in many areas of Pakistan. Girls, especially those in public sector schools, might have fewer opportunities for supplementary learning support, like private tuition or digital learning tools. They may have limited interaction with English outside the classroom, thus increasing the importance of the role of school-based instruction. Researchers will look at this particular group to illustrate both linguistic patterns and the contextual factors that impact language learning outcome.

For this investigation, a semi-urban community of Renala Khurd in Okara district is a suitable setting. It is a representative setting of a typical educational scenario in Punjab where the dominant language is Punjabi and English is taught as a second language in limited contexts and in resource limited situations. The study of learners in this context enables one to have a more realistic view of phonological interference in real classroom situations than in idealized or controlled situations. Results of such a context will probably be more applicable to other similar regions within the province.

This study was conducted on a large sample, 500 female primary students, thus a comprehensive analysis of pronunciation patterns has been possible. A larger sample size provides more reliable findings and is more likely to detect patterns of similarities and differences within and across grade levels and learning backgrounds when compared to smaller scale studies, which may only capture a portion of the variation. The aim of the study is to go beyond general observations by employing structured reading tasks as well as phonetic analysis in order to obtain detailed information about the errors in the use of vowels and their possible causes.

This is not an understatement: phonological interference needs to be taken care of at an early age. Learners WILL most likely continue using familiar patterns unless they are made aware of the difference between the sound system of their L1 and L2. Pronunciation teaching is not simply a matter of correction, it needs to be aware, practised and exposed. Students should be given opportunities to hear, repeat and feedback in a supportive setting. If not, there will be no strategy in place to bridge the gap between intended and produced speech.

This study also makes a general contribution to the current debates in the area of second language acquisition, namely in the area of cross-linguistic influence and in the area of early language learning. The existence of L1 interference, as well as the need for context-specific studies reflecting the reality of the different learner populations is already well known. Most of the literature available is related to adults or learners in well-resourced schools. This study enhances the existing knowledge on phonological development in ESL settings by looking at the young learners from semi-urban setting in Pakistan.

Implications for practical application of the results of this study are curriculum design, teacher training, and classroom practice. If some vowel errors are determined to be pervasive and systematic, then specific teaching techniques can be used to help address these errors. For instance, teachers can use minimal pair exercises, verbally demonstrate the movements of the mouth, and ask learners to listen to models to help them hear the difference between two similar sounds. Basic phonetic teaching can also be part of the teacher training process, providing teachers with the skills required to improve pronunciation instruction.

Finally, it is important to emphasize that the learning of English vowel sounds is not just a question of practice or exposure for the part Punjabi-speaking primary school students, but is influenced by the phonological structure of their L1. This influence is natural but if uncorrected can cause long-term errors. This study attempts to offer a theoretical understanding and practical recommendations about these patterns when applied to a specific and under-researched context. It highlights the importance of pronunciation in early language learning and the significance of L1 interference in the process of language learning.

1.1. Research Objectives

1. To identify the major patterns of English vowel pronunciation errors among Punjabi-speaking female primary students in Renala Khurd.
2. To analyze the influence of L1 Punjabi phonology on the production of English vowel sounds.
3. To examine the types of phonological interference (such as substitution, vowel length variation, and epenthesis) in the speech of the selected students.

1.2. Research Questions

1. What are the most frequent English vowel pronunciation errors made by Punjabi-speaking female primary students in Renala Khurd?
2. How does the phonological system of Punjabi influence the production of English vowel sounds among these learners?
3. What types of phonological interference are most prevalent in the English speech of the selected students?

1.3. Significance of The Study

This study is important because it deals with a longstanding issue in L2 English acquisition at the primary level that has not been widely investigated, the interference of L1 phonology on L2 vowel production. It targets the female primary students in Renala Khurd, and offers context-specific information about the development of early pronunciation patterns in a semi-urban Pakistani environment with low exposure to standard English. The results provide insights into SLA studies as they show that the errors made in the second language are not random but systematic and rule-governed, and depend

on interference from the first language. The study has practical value for pedagogical reasons, as it provides information for teachers, curriculum designers, and policymakers regarding the importance of explicit pronunciation instruction and the incorporation of explicit phonological instruction and other pronunciation-related activities in early English education. Finally, it helps to develop better teaching methods for increasing the intelligibility of learners and to reduce the possibility of incorrect pronunciation patterns being fossilized in the long term.

2. Literature Review

Phonological interference in second language acquisition (L2) has been a major issue in applied linguistics, especially in multilingual settings where learners are learning English in addition to their native language (L1). The contact between the local languages and English in Pakistan has led to unique phonological patterns. Of these, the link between Punjabi as L1 and English pronunciation has been a growing area of research focus, particularly on the production of vowels.

2.1. Phonological Interference and Second Language Acquisition

The effect of a learner's L1 on L2 sound system is known as phonological interference. The general consensus is that learners' errors are systematic rather than random when they come across sounds they are unfamiliar with, because they use their existing phonological knowledge. This is based on the theory of cross-linguistic transfer that suggests that the similarities between L1 and L2 make learning easier, and the differences make learning more difficult.

Since the early studies in L2 pronunciation, L1 interference has been identified as one of the most important factors in L2 pronunciation errors. This phenomenon is very strong in the Pakistani context because of the structural differences between English and local language. Syed (2022) notes that L2 interference is the major source of pronunciation errors in the L2, particularly when L1 learners try to map an L2 unfamiliar phoneme to an L1 familiar sound category. The mapping process leads to the predictable patterns of substitution and modification that are determined by the learner's L1 phonological inventory.

2.2. English in Pakistan and the Emergence of Pakistani English

English is not just a language of foreign origin but it has become a localized form of English, that is, "Pakistani English (PakE)". This variety is a reflection of the influence of the regional language which includes Punjabi, Urdu, Sindhi and Pashto. These linguistic backgrounds influence the phonological characteristics of Pakistani English, making it different from the standard British or American English.

Recent studies have focused on the systematic phonetic differences in Pakistani English with special focus on the production of vowels. Riaz 2025 did an acoustic analysis of English vowels in Pak English and identified some consistent trends in the front raising

of vowels and back centralisation of vowels . Such variations are not random but rather are attributable to the effect of L1 phonological patterns and sociolinguistic variables. This reinforces the idea that L1 interference is a key determinant of local variants of English.

Likewise, Mushtaq (2025) states that phonological differences in Pakistani English have a significant impact on intelligibility particularly in cross-cultural communication. The study also highlights the fact that differences in vowels and consonants, due to different native languages, may affect listeners' understanding of the Pakistani language. This highlights the need of the understanding of phonological interference as a learning problem, as well as a communication problem.

2.3. Punjabi Phonological System and Its Influence

The phonological system of Punjabi is very different from that of English and is a major regional language in Pakistan. It has features like the distinction between long and short vowels, nasalisation, and a relatively reduced number of vowel contrasts. Such differences pose problems for Punjabi-speaking learners in the learning of the English vowel phonemes.

The problem is the lack of some English vowels in the Punjabi language. In fact there are no direct equivalents in Punjabi for certain vowels like /æ/, /ʌ/ and /ɜ:/, etc. Consequently, the learner's first substitutions tend to be for the closest vowel available in the learner's language. This results in systematic errors in pronunciation, and these may be repeated and reinforced.

This can be substantiated by empirical evidence. Language interference (L1) in Punjabi speakers was observed by Khan et al. (2020) who noted that some English vowels were conflated with each other, e.g., /ɔ:/ and /ɒ/. The study was conducted using acoustic analysis and showed that these vowels are not clearly distinguished by the Punjabi speakers, which resulted in less phonetic contrast amongst them. This merging phenomenon points to the difficulties of the Punjabi vowel system in expressing the vowel differences of English.

More recent research by Sarwar and Abbasi (2024) also shows the impact of Punjabi on English phonology. They concluded that the learners' lack of consistency in the structure of their syllables and stress patterns is directly linked to their mother tongues, Punjabi. While the study was on stress and syllabification, the results will have implications in the production of vowels, since they are interrelated aspects of phonology.

2.4. Vowel Production Challenges in ESL Learners

It is well known that the production of vowels is one of the most difficult L2 pronunciation errors. Vowels are different from consonants in that they must be produced with exact control of the tongue position, lip rounding and the configuration of the vocal tract. Any deviation at all can have a drastic impact on meaning.

One of the major problems that most often occur in vowel errors with Pakistani learners is the complexity of the English system of vowels. In English, there are more sounds of the vowels such as tense and lax not always present in Punjabi. This mismatch results in the substitution, reduction or distortion of vowel sounds.

According to Riaz (2025), there are systematic deviations observed in the production of vowels by Pakistani Learners namely centralization and length variation. These deviations are related to both linguistic and social factors, meaning that pronunciation is not only determined by the phonological system, but also by exposure and use patterns.

Another significant result was that errors of the vowels could have a great impact on intelligibility. Recent research on the non-native vowel system has shown that errors in the production of the vowels can have an impact on the comprehension of the speech, which can be challenging (Kashifa et al., 2025 as cited by). This underscores the need for paying attention to the pronunciation of vowels as a part of early language learning.

2.5. Types of Phonological Interference in Punjabi ESL Learners

The study of Punjabi ESL learners has identified a number of common phonological interference, especially in the case of vowel production. These include vowel length variation, epenthesis and substitution.

Substitution means when the learner uses a vowel from their native language (Punjabi) that sounds similar in English. This is the most common type of interference and it has a direct connection to the different vowel inventories.

Another major problem is the length variation of vowels. Punjabi distinguishes short and long vowels, the rules for this distinction are different from that of English. Learners therefore tend to use vowel length patterns incorrectly, and this causes them to mispronounce words.

Epenthesis (addition of extra vowel sounds) is also common. When learners are exposed to consonant clusters not allowed in the Punjabi phonology. For instance, a word such as school could be pronounced as sakool, meaning that it was trying to incorporate the phonotactic structure of English into the pattern of Punjabi.

In a study conducted by Ahmed (2024), the investigation of Punjabi school students revealed that L1 interference, particularly in the production of vowel sounds is mainly responsible for the phonetic differences in the pronunciation of English in the target language. The study highlights that these errors are systematic and predictable, which points to the notion of phonological interference in a predictable pattern.

2.6. Role of Exposure and Educational Context

There are phonological differences between languages that are a major source of pronunciation errors, but other factors can also be important in the education environment. In Pakistan the teaching of English tends to be traditional, with a focus on reading and

writing skills rather than speaking and listening. This means that learners' pronunciation is limited.

Sarwar and Abbasi (2024) point out that pronunciation has been ignored in Pakistani classrooms, resulting in challenges in fluency and accuracy. This phonological neglect results in learners not being explicitly instructed in English sound production, but rather having to use their L1 knowledge.

Likewise, the exposure to native pronunciation or standard pronunciation of English is restricted, especially in rural and semi-urban settings. The exposure to authentic English speech is limited, and occurs infrequently for students. This cooks a crisis that is hard to rectify as incorrect pronunciation becomes the norm.

2.7. Research Gap

Though there are growing number of studies related to phonological interference in Pakistan, there are still some lacunae to be addressed. First, a lot of the research that has been conducted has been on adult learners, especially those in Universities. Primary level learners are a critical stage in the development of language and there is little research on this group.

Secondly, numerous studies have employed small sample sizes, making the results applicable only to the specific sample and population studied. To get more complete information on pronunciation patterns a large study of a variety of speakers should be conducted.

Thirdly, the present limitation of the study is that it focused only on the female learners so that research based on a specific context of semi-urban could not be conducted. Gender and place may affect the language learning experience, but these are seldom included in the current studies.

Lastly, some research has also been conducted on general phonological variation while very little work has been devoted to the production of vowels. With the significance of vowels in regards to intelligibility, this is a large void in the literature.

Literature clearly shows that the L1 Punjabi has a significant effect on the pronunciation of English for the Pakistani learners of English. These differences in vowel systems, and limited exposure and teaching, leads to systematic differences in pronunciation. This is the first study to provide insight into the phonological variation and L1 influence of classroom primary school children and thus a need for more focused research on the production of vowels in the primary classroom, especially in contexts that have not been well studied, such as female students in the semi-urban area.

The purpose of this study is to fill these gaps by studying the production of English vowels in primary female learners of the Punjabi language from Renala Khurd. In doing so, it not only enhances the theoretical knowledge but also promotes the improvement of English language teaching in Pakistan

3. Methodology

3.1. Research Design

The design of the study was a qualitative case study which explored the phonological interference of L1 Punjabi on L2 English, by primary level learners. The selection of case study method enabled the study of pronunciation patterns in the context of the educational and sociolinguistic context of Renala Khurd, specifically with the sample of the female primary school students. The study was based on naturally occurring speech data that were gathered using carefully designed reading tasks, and this allowed the researcher to observe regular phonological patterns, instead of isolated errors. The study was oriented towards the qualitative approach, and included quantitative elements (frequency of errors), but its overall emphasis was qualitative and focused on detailed description and interpretation of vowel productions affected by L1 phonology.

3.2. Population and Sampling

The study sample comprised of all primary school female students from public sector schools of Renala Khurd, Punjab, Pakistan. A sample of 500 students was randomly drawn from this population for a wider spread and reliability of findings. Students were sampled by stratified sampling to include students across age levels and learning stages (Grades 1–5) to capture variations across age and learning stage. All the participants had to be native speakers of Punjabi and studying English as a subject in school. The method of sampling enabled the study to include a good spectrum of pronunciation variation and to be relevant to the research questions.

3.3. Data Collection and Data Analysis

The data were obtained in the form of structured pronunciation tasks which were designed to elicit certain English vowel sounds. These activities consisted of word lists and reading simple, carefully chosen sentences with the target vowels /æ/, /ʌ/, /ɜ:/, /ɪ/, and /i:/. The participants were recorded on audio tapes in a specially arranged classroom for clarity and uniformity of the speeches. The recordings were then transcribed according to standard phonetic conventions to determine the errors of the speakers' pronunciation of English. The errors were classified into major phonological interference categories such as vowel substitution, vowel length variation and epenthesis for the purpose of data analysis. Recurring pronunciation features in the data set were found by looking for patterns, and the highest number of occurrences of each error were highlighted. The analysis was oriented towards establishing the correlation between these patterns and the phonological system of Punjabi and also to get a clear idea of how L1 influences L2 vowel production.

4. Data Analysis

The data analysis was done following the research aims and questions, so as to find the patterns of errors in the pronunciation of English vowels and to see the effect of L1

Punjabi on these patterns. The 500 participants were recorded on tape and transcribed and analyzed according to the phonetic conventions. Analysis was done using a qualitative descriptive approach with frequency count to identify the repetition of the data. The results have been reported in three types of substitution: vowel substitution, vowel length variation and epenthesis, as defined in the methodology.

4.1. Vowel Substitution Patterns

Analysis showed that vowel substitution occurred most often as a type of phonological interference among the participants. Many students used the closest vowels to the English ones that were known to them in Punjabi. For example /æ/ as in 'cat' was often heard as /a/ and /ʌ/ as in 'cup' was often heard as /ə/ or /a/. Likewise, the central vowel /ɜ:/ (as in bird) was often replaced by /ə/ or /ɪ/.

The substitutions were not random but systematic and may be explained by the fact that the sounds are not present in the Punjabi phonological system. In the whole data sample, about 60-70% of the samples were found to be consistent in their substitution of these vowels. This study addresses the first research question and found that certain vowels like /æ/, /ʌ/, and /ɜ:/ pose the greatest difficulty for Punjabi-speaking learners. It also matches the first research objective, where the major patterns of pronunciation errors in the use of vowels were identified.

4.2. Vowel Length Variation

The second major pattern that was seen in the data was the variation in the length of vowels. Participants were often confused about the difference between short and long vowels and would lengthen the short vowels or shorten the long vowels in an inappropriate manner. For instance, the short vowel /ɪ/ (as in sit) could have been pronounced as the long vowel /i:/ (as in seat), and the other way round. Likewise, the vowels before double r were sometimes shortened in words with /u:/ to /ʊ/.

This pattern is due to the partial similarity of the vowel systems of the Punjabi and English languages. Punjabi, like English, has a distinction for long and short vowels; however, the rules for these distinctions are different from those in English. Consequently, L1 vowel length patterns seemed to be carried over in the production of English vowels. About 45-55% of the listeners showed this type of interference, suggesting that interference of this kind is less prominent than interference of the other type, substitution. This finding was relevant to the second research question as it showed the effect of L1 phonological rules on the production of the English vowels.

4.3. Epenthesis (Vowel Insertion)

The third type of analysis was epenthesis—whereby extra vowel sounds are added. This phenomenon was found mostly in words with consonant clusters which are not frequently seen in the Punjabi language. In other cases the voicing of a consonant followed the same pattern as is found in the word for 'school' where the word was commonly

pronounced as sakool, while for 'station' it was isteshan. Vowel insertion simplified the pronunciation for the learners as it followed the phonotactic principle of Punjabi; which does not have many complex consonant clusters.

Epenthesis was not as common as substitution, and was observed in about 30-40% of the participants. This shows that it is not a common pattern of interference but it is a regular pattern among learners. This is a third objective of the study and the identification and classification of different types of phonological interference found in the speech data.

4.4. Overall Patterns of Phonological Interference

In comparing the three types of interference, vowel substitution proved to be the most common type while vowel length variation and epenthesis were the least common. The overall error patterns were similar across the grade levels, with younger students (Grade 1-2) making more errors. Errors did not decrease significantly over time as older students (Grades 4–5) generally made only slight gains.

The analysis here confirms that L1 Punjabi has a strong and systematic influence on the production of English vowels. The errors made were not random or isolated but rather predictable and phonological in nature that showed a relationship to the learners' home language. Clearly, the present study directly addresses all three research questions and realizes the study objectives in terms of providing a clear and evidence-based understanding of the impact of Punjabi phonology in the English pronunciation.

4.5. Summary of Findings

1. The English vowels that are not present in the Punjabi language are always replaced by familiar sounds.
2. It is difficult for learners to make distinctions between the long and short vowels as a result of the difference between the two languages.
3. Epenthesis is used to simplify complex consonant structures.
4. The phonological interference is regular and will be found throughout the primary grades.
5. The results of this study emphasize the importance of focused pronunciation training relevant to the pronunciation problem areas of PSS students with a focus on vowels.

5. Discussion

The results of this research clearly confirm that L1 Punjabi phonology has an important and systematic influence on the production of English vowels among the L1 Punjabi speaking female students of primary school in Renala Khurd. Three patterns of phonological interference were dominant, namely vowel substitution, vowel length variation and epenthesis. These findings are not unique but agree with the majority of the literature on second language acquisition and phonological transfer that supports the idea

that pronunciation errors in ESL learners are predictable and are mostly a result of the influence of the L1.

Among the most salient results of this study is the occurrence of a lot of vowel substitutions, including changes of English vowels like /æ/, /ʌ/, and /ɜ:/. In both cases, the vowels were replaced by more familiar sounds of the L2 system, which reinforced the idea that L2 learners use their L2 phonological system when learning unfamiliar L2 sounds. The result is very much consistent with Syed (2022) that states learners generally map the unknown L2 phonemes onto the closest equivalents in their L1. The regularity of the substitutions in the present study also suggests that phonological interference is not random but follows rules. Moreover, Khan et al. (2020) also came across the phenomenon of blending or substituting English vowels by Punjabi speakers because there is no equivalent contrast in their home language. The uniformity of these patterns in a large sample of 500 students supports the validity of this statement and shows that vowel substitution is a common problem in Punjabi language acquisition.

Another key finding of the study is the confusion related to vowel length. Punjabi has a distinction between short and long vowels, but it seems that this distinction is not always used in English by the learners. Short vowel or long vowel words were often mispronounced, with extension of short vowels or shortening of long ones. This finding is consistent with the results of Riaz (2025) who found that Pakistani learners make errors in crosslinguistic differences in the length of vowels. The results of the present study contribute to this knowledge, thus revealing that this confusion has been observed at the primary level and continues up to various grades. This indicates that students are not being taught the correct vowel length differences in English nor given adequate feedback.

It is observed that the participants' speech shows epenthesis in the pronunciation of English words, which further explains that the phonotactic rules of Punjabi have influenced the pronunciation of English. Learners also added vowel sounds to consonant clusters such as sakool for school. This is consistent with the discovery made by Ahmed (2024) that vowel insertion was a common method used by Punjabi learners to simplify complex consonant structures. Epenthesis in the present study supports the concept that learners are actively accommodating English words to their L1 system, namely, their phonological system. This strategy may help with pronunciation but has a negative effect on the accuracy and understanding of spoken English.

The findings taken together are very supportive of the theoretical framework of cross-linguistic transfer in the L2 acquisition process. The findings indicate that the learners' pronunciation of English is not completely new but rather a way of using the system of their mother tongue. This is especially true of primary children with less mature phonological awareness and who are likely to rely on familiar patterns. The research

showed that these errors continued across grade levels, indicating that these errors can become ingrained and result in fossilisation if not addressed in a specific way.

The results of this study also echo the general studies on the local variety of Pakistani English. Mushtaq (2025) highlights the impact of regional languages on the phonological variation of Pakistani English and how this variation can affect intelligibility in international communication. The occurrence of errors in the area of the vowels found in this study add up to this larger picture of variation, and serve to show the impact of local linguistic influences on the use of English in Pakistan. Such variations, however, can pose problems in situations where "standard" pronunciation is expected, but not in situations where local pronunciation is acceptable. This poses more serious questions regarding the objectives of English language teaching in Pakistan: is it to be intelligible within the local context or is it to be aligned with the international standards?

This study has also emphasised how the educational context contributes to phonological interference. Acknowledging the importance of pronunciation, Sarwar and Abbasi (2024) noted that it is rarely emphasized in classrooms in Pakistan, while reading and writing skills are given more importance. The results of the present study indicated that this attention deficit to pronunciation can be one of the causes of the continuation of the errors of the learners in the field of vowel errors. Students in this study also demonstrated similar patterns of interference across grade levels, suggesting that these interference patterns are not being addressed effectively in the classroom. This indicates that there is a problem with the way phonology is being taught, i.e. either not enough or not at all.

Moreover, the emphasis on primary students who are female gives insight into the impact of the context on language learning. In some semi-urban environments, female students might not be exposed to English outside of the classroom, limiting their chances to listen and do accurate pronunciation. This restricted exposure, together with the ways that language is taught, allows for L1-influenced pronunciation to become 'normalised'. Improvements in pronunciation in this study indicate that not only does the teaching approach need to change, but also greater access to authentic input of English also needs to occur.

Overall, the study validates many of the observations that were reported in earlier studies, but it adds to the existing knowledge with the use of a large sample at the primary level. Existing literature has focused mainly on the adult learner, thus there is limited knowledge regarding the development of phonological interference in early language learning. This study shows that pronunciation errors are formed early and may remain for a long time by analysing 500 primary school students. This illustrates the need for early intervention, because the sooner it's corrected, the sooner it is easier.

The study has, however, some limitations that need to be taken into account. Frequency counts were employed to determine the common patterns, but the analysis was mostly qualitative. More detailed statistical analysis and acoustic measurements could be included in future research to give a more detailed knowledge of how the vowels are produced. Furthermore, the study was conducted with only female students in a specific geographic region which could restrict the applicability of the results. The data of male students and other regions would give a comprehensive picture of phonological interference in Pakistan.

From the above discussion it is evident that the findings clearly show that L1 Punjabi has a significant effect on the production of English vowels among primary learners. The findings of this study are in line with the previous studies and also support the theories that hold that phonological interference plays a key role in L2 acquisition. Simultaneously, the study identifies the need for better educational practices and intervention to address these challenges. If nothing is done, learners will probably be using L1 pronunciation patterns and this may have a negative effect on their ability to communicate in English.

6. Conclusion

The present study findings indicate that L1-Punjabi has a strong influence on the production of English vowel sounds by female primary students in Renala Khurd and phonological interference occurs in definite patterns. The results show that learners' difficulties are especially prominent with the vowels which are not found in the Punjabi language and have been observed in the use of extra vowel sounds, confusion in vowels length and substitution of phonemes. The errors are not accidental but rather are entrenched in the learners' native language system and are not corrected throughout the grade levels because pupils have not heard them enough and class time is not spent enough on their pronunciation. The study shows the importance of the need to provide early and targeted phonological intervention in order to prevent the pronunciation patterns from becoming ingrained and impacting intelligibility and overall language proficiency. Thus, it highlights the need for greater awareness of the importance of pronunciation teaching and phonological sensitivity at the primary level in order to aid in the development of more accurate and effective English language acquisition.

7. Recommendations

1. Use explicit pronunciation teaching and practice at the primary level, with specific focus on difficult English vowels (e.g. /æ/, /ʌ/, /ɜ:/) by using phonetic drills, minimal pair and guided repetitions to minimize L1-based substitution errors in pronunciation.

2. Offer teacher training to develop basic phonetics and phonology skills in order to detect pronunciation problems correctly and use suitable corrective strategies instead of ignoring and normalizing pronunciation errors.
3. To expose learners to authentic input material in English (Audio Visual), Listening activity in the classroom and interactive speaking activity to help students internalize correct English vowel sounds and minimize the use of the phonological patterns of the village language (Punjabi).

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