Identifying Acoustic Variability Patterns in Spoken English of Fricative Consonants Among Pakistani Native Punjabi Speakers

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Abstract

This study examines the phonological variance in English pronunciation among elementary students who regularly speak Punjabi. It focuses on the distinctions between the pronunciation of consonant fricatives and Received Pronunciation (RP). Using a quantitative approach, 50 elementary students proficient in Punjabi were selected from public sector schools using judgmental and purposive sampling techniques. Data were collected through audio recordings of fricatives /f/, /v/, /θ/, /ð/, /s/, /z/, /ʃ/, /ʒ/, and /h/ in various word positions. Analysis using PRAAT software assessed intensity and pitch. Results revealed significant variations in fricative intensity and pitch compared to RP. /f/ had greater intensity, /v/ was subdued, and dental fricatives /θ/ and /ð/ showed reduced intensity. /s/ and /z/ varied extensively, /ʃ/ and /ʒ/ were pronounced with lower intensity and pitch, and /h/ had diminished intensity. Recommendations for educators include focusing on intensity and pitch exercises, using PRAAT for feedback, and emphasizing accurate speech organ placement. This study underscores the need for tailored pronunciation guidance for Punjabi-speaking students. Future research should explore additional phonetic features and employ spectrographic analysis.

Keywords: Acoustic Analysis, Phonological Variation, Pitch, Punjabi-Speaking Students.

Introduction

Throughout its more than 1,400-year history, the West Germanic language of English has been greatly impacted by Latin, French, and other North Germanic languages (Ding & Saunders, 2006). Today, it is the most widely used international language, spoken by approximately 379 million people as their first language and 753 million as a foreign language in over 100 countries (Akpan, 2021). English became the language of governance, commerce, and education under British rule, symbolizing social progression and prestige (Pennycook, 2017). In the Punjab region, English and Punjabi interacted, mutually influencing each other without Punjabi being supplanted (Zaidi, 2010).

Punjabi, an Indo-Aryan language spoken in both Pakistan and India, derives its name from "Punj" (five) and "Aab" (water), referring to the region's five rivers. It is the first language of most people in Pakistan and an official language in India (Dhanjal & Bhatia, 2014). Punjabi has several dialects, with Majhi considered the purest form (Chohan et al., 2018). Punjabi is

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considered a provincial language in Pakistan and an official language in Punjab, Chandigarh, Himachal Pradesh, Delhi, and Haryana in India (Chohan & García, 2019).

The phonological diversity in Pakistani English, an emerging variant, is influenced by regional languages, including Punjabi. English, which is used as the medium of instruction at the university level in Pakistan, is crucial for higher education, even if it is not a native tongue (Noor et al., 2024). Differences in vowel lengths, consonant clusters, and intonation patterns between Punjabi and English frequently cause pronunciation mistakes in Pakistani English. Among these phonetic challenges, fricative consonants in English, which are produced by the friction of breath in a narrow opening, present particular difficulties for Punjabi speakers (Tabbasum, 2024). The acoustic variability in the pronunciation of English fricatives by Pakistani native speakers can be attributed to the phonetic influence of Punjabi, which has its own distinct set of fricative sounds and lacks some that are present in English. Understanding these acoustic variability patterns is crucial for improving English pronunciation teaching methods in Pakistan and aiding language learners in overcoming these specific challenges (Zahra & Khaleel, 2024).

Standard English pronunciation is distorted and deviated due to Punjabi phonetic structures' influence on English pronunciation (Ahmed et al., 2023). For example, the absence of certain consonant groupings in Punjabi poses challenges for forming similar groupings in English words (Amjad et al., 2022, a, b). This is particularly evident in the production of fricative consonants, where the phonological features of Punjabi can significantly impact how these sounds are articulated in English.

Limited exposure to English-speaking environments further exacerbates the difficulty in mastering English fricatives for Pakistani speakers. Unlike their urban counterparts, many learners have fewer opportunities to engage in authentic English communication settings, which hinders their progress in English phonetics (Fatima et al., 2023). This close interaction between Punjabi phonetics and English learning underscores the challenges in acquiring English fricative sounds. By identifying and analyzing the acoustic variability patterns in the spoken English of Pakistani native speakers, educators can develop more targeted strategies to address pronunciation issues and enhance learners' overall language proficiency.

Research Objectives

1. Investigate the English consonants that cause English pronunciation difficulties for native Punjabi speakers due to any influence of their L1.
2. To compare the intensity and pitch values of consonant fricatives produced by native Punjabi speakers with the Received Pronunciation (RP) standard.

Research Questions

1. What specific English consonants cause pronunciation difficulties for native Punjabi speakers, and how is this influenced by their first language (L1)?
2. How do the intensity and pitch values of consonant fricatives produced by native Punjabi speakers compare with those of the Received Pronunciation (RP) standard?

Literature Review

Roach (2009) argued that mastering English pronunciation should be based on phonemes rather than the letters of the alphabet. Adnan and Tehseem (2022) suggested that the spelling system generally mirrors the pronunciation of a language, a trend observed in numerous languages. However, English spelling needs to consistently guide learners in pronouncing words correctly. Standard English (RP) comprises 26 letters and 44 sounds, which consist of 20 vowels and twenty-four consonants. Roach (2009) highlighted the intricacy of English spellings and

stressed the significance of comprehending phonetics and phonology to generate speech sounds appropriately.

Roach (2009) suggested using Received Pronunciation (BBC Pronunciation) as a model for foreign learners. The British have developed Standard dictionaries in Received Pronunciation, categorizing consonant sounds into different groups based on their manner and place of articulation. Nasir (2022) highlighted the difficulties that Pashto speakers encounter when learning English consonants. Using PRAAT, the researcher found that, with some minor exceptions, Pashto speakers generally articulate fricatives like /s/, /z/, /ʃ/, /ɣ/, and /ɦ/ similarly to native English speakers. Unlike English, Pashto speakers distinguish fricatives like /ɸ/ from /f/.

Furthermore, the Pashto language structures fricatives such as /χ/, /X/, /ɣ/, /sˤ/, /zˤ/, /θ/, /ð/, and /ħ/, which do not exist in English. Notably, Pashto speakers pronounce the fricative /ʕ/ in a distinct manner. To enhance intelligibility and communication with native speakers, Nasir (2022) suggested that Pashto learners receive training on English fricative pronunciation. According to Asad et al. (2020), urban speakers modified their pronunciation to comply with Punjabi phonotactic limitations, frequently employing epenthesis in clusters of syllable-initial consonants. Unlike urban speakers, who managed to pronounce English words without restructuring consonant clusters, rural speakers modified these structures to fit their phonological rules, demonstrating L1 interference.

The mother tongue influence is a key factor in declusterization but can be mitigated through listening and practice (Asad et al., 2020). Noor et al. (2024) revealed significant phonological differences between Pakistani English and standard British English in terms of vowels, diphthongs, and syllabic patterns, despite the presence of loanwords in Sindhi, and these phonological variations indicated that English consonants are articulated differently by native speakers of the Vicholi dialect. Bux et al. (2024) Investigated the challenges Pashto ESL learners face in articulating consonants /f/, /k/, /t/, and /d/ less challenging, while /θ/, /ð/, /v/, /ʒ/, and /w/ were the most problematic. These difficulties are attributed to the differences in sound systems and the absence of certain sounds in Pashto. Malik and Kokub (2020) found that the Punjabi glottal fricative /h/ exhibits different acoustic properties in the Majhi and Lehndi dialects. In the Majhi dialect, /h/ merges with neighboring vowels in all positions (initial, medial, final).

In contrast, in the Lehndi dialect, this merger occurs only at the initial position of words. Gramley (2018) investigated challenging English phonological configurations due to Punjabi phonetics. Chohan and García (2019) emphasized the need for further research on Punjabi phonology by examining phonemic differences between English and Punjabi using the Levenshtein algorithm, highlighted a gap in existing literature, and underscored the importance of understanding these phonemic variations. Habib and Khan (2019) found that Punjabi speakers modify English consonant clusters by inserting vowels, primarily the central /ə/ vowel, to align with Punjabi phonology and provided insights into how Punjabi phonological patterns influence the adaptation of English consonant clusters. Riaz (2021) investigated the fact that uneducated Punjabi speakers often pronounce borrowed English words differently from Standard English due to the influence of their mother tongue.

Jadoon and Ahmad (2022) identified Pakistani English as a variant influenced by local languages with distinct phonetic and phonological features. Walter (2010) found that phonological awareness and word recognition effectively differentiated skilled readers from struggling ones in both native English speakers and ESL learners, with no significant differences between the groups. ESL learners outperformed native English speakers in word recognition and phonological processing but faced more challenges with English grammar tasks. Punjabi, an Indo-Aryan language, has contrastive retroflex and dental series, but little is

known about their phonetic and phonological properties across word positions (Hussain et al., 2017).

Research Methodology

This study employed a quantitative research method within the framework of contrastive analysis. Grounded in the positivist paradigm, the approach emphasizes objective measurement and statistical data analysis. The method is designed to address the specific objectives and framework of the project, utilizing numerical data to explore the research questions rigorously.

Theoretical Framework

This study aims to conduct a Contrastive Analysis of Punjabi and Received Pronunciation (RP) English consonants. When two languages are compared for their syntactic, lexical, morphological, or phonological aspects, the theory of Contrastive Analysis introduced by Lado in 1957 is adopted. Various versions of Lado's theory have been utilized by researchers in the Contrastive Analysis of numerous languages, such as French, German, and Arabic, in comparison to English. Lado introduced the Contrastive Analysis Hypothesis in 1957, proposing that learners transfer the entire system of their mother tongue to the target language and apply the features of their mother tongue to the second language they learn. This theory suggests that the inaccurate perception of sounds leads to inaccurate production.

Population and Sampling

For this study, a sample of 50 students from the public school sector in District Kasur was selected. The purposive and judgmental sampling technique ensured participants had the necessary linguistic background in Punjabi and English. This approach allowed for the deliberate selection of individuals who were most likely to provide relevant and rich data for the research objectives.

Data Collection

For the data collection process, 50 participants, 25 males and 25 females from public sector elementary schools in the district of the Punjab province, pronounced words that were recorded. The participants consented before being given words with fricative consonants in various positions. Participants were instructed to say the words naturally, as they would in everyday English conversation. Recordings took place in a quiet room at the participants' schools, using a Lenovo core i-7 8th generation laptop and a sensitive microphone within a specific frequency range. Each word was pronounced with a two-second gap. The researcher used quality headphones to transcribe the words phonetically.

On the other hand, the Oxford Advanced Learner's Dictionary was utilized to gather data on Received Pronunciation (RP) for acoustic analysis. The data were transcribed and analyzed using PRAAT software, through which spectrograms were obtained to observe the data, including intensity and pitch. These acoustic metrics were compared to Received Pronunciation (RP) benchmarks to quantify pronunciation discrepancies.

Data Analysis and Discussion

Data analysis is a crucial phase of research that requires careful handling on the researcher's part (Moser & Korstjens, 2018). The significance of data analysis lies in the fact that conclusions and results are derived from it. The researcher obtained 46×50 =2300 number of recorded sounds, which included 23x25=575 recorded words of English for English fricative consonants by Punjabi speakers and 23x25=575 recorded words by native speakers obtained through the Oxford Advanced Learner's Dictionary. Each participant's recorded sounds were transcribed as received from the recordings heard through sensitive headphones. The

transcribed speech was analyzed using PRAAT. It extracted acoustic characteristics, including intensity and pitch, from recorded pronunciations.

Exploring Fricative Variations:

The impact of Punjabi phonology on /f/ and /v/ pronunciation in English

In Punjabi phonetics, the phonetic elements /f/ and /v/ are relatively uncommon and typically softer than their English equivalents. This disparity can challenge Punjabi speakers in accurately articulating these sounds with the same intensity and pitch as in Received Pronunciation (RP) English. For instance, the /v/ sound in Punjabi often features a softer articulation, sometimes resembling a /w/ sound, while the pronunciation of /f/ may lack forcefulness. This influence can lead Punjabi speakers to articulate the English /f/ and /v/ sounds with reduced intensity and varied pitch. The outcomes indicated that approximately 85.71% of Punjabi speakers' pronunciation closely aligned with RP intensity standards for the /f/ sound; however, around 14.29% showcased deviations from the preferred intensity range. Impressively, all students managed to achieve perfect alignment with RP pitch requirements.
Regarding the /v/ sound, roughly 71.43% approached RP intensity standards, with approximately 28.57% exhibiting deviations. Nonetheless, all students effectively matched RP pitch standards. This research spines the methodology and results of Nasir (2022) in a comparative analysis of English and Pashto consonants. Like Nasir's approach, the focus here is on exploring phonetic variations among Punjabi ESL learners, especially in pronouncing interdental fricatives and alveolar plosives. Similar to Punjabi speakers, Pashto speakers may struggle with accurately reproducing particular English consonant sounds due to differences in their native phonetic systems.
The variation in /v/ pronunciation can be attributed to the limited exposure of Punjabi speakers to this fricative in their native phonology, where the /v/ sound often resembles a /w/ sound. This finding aligns with the notion of 'phonological transfer,' where speakers of one language impose their native phonetic rules on the target language. Thus, explicit pronunciation training focusing on these fricatives is crucial for ESL learners. Future research might explore the effects of focused intervention on improving the accuracy of these sounds.

Exploring Fricative Variations:

The Impact of Punjabi Phonology on/θ/ and /ð/Pronunciation in English

Significant intensity and pitch variation patterns are revealed when Punjabi-speaking elementary pupils pronounce the dental fricative consonants /θ/ and /ð/compared to Received Pronunciation (RP) norms. Regarding the dental fricative /θ/in the initial position, 100% of students indicate pitch levels below the RP norm, while 71.43% exhibit intensity levels below the RP standard. This pattern suggests that students who speak Punjabi tend to pronounce the first letter of words with a less strong and lower-pitched / θ/. On the other hand, 100% of students have a pitch higher than the RP standard for the dental fricative /ð/ in the beginning position, whereas 85.71% have a lower intensity. This indicates that for /ð/, the pitch tends to be more significant in the beginning position, while the intensity is often lower.
All students produce /θ/ in the medial location but at a pitch that is higher than the RP norms and with less intensity. This persistent pattern indicates a significant departure from RP norms, perhaps due to Punjabi phonological transfer. In the same way, 57.14% of students have a lower pitch for /ð/, and 100% have a higher pitch. This shows that, despite some intensity changes, the pitch continuously stays above the RP threshold.
In the last position, 42.86% of pupils have reduced intensity, and 85.71% have a pitch below the RP level for the dental fricative/θ/. This suggests a slight improvement in intensity control, possibly due to a better understanding of the phonetics of word-final English. In contrast, 85.71% of students had a pitch below the RP standard for /ð/, and 57.14% of students displayed

lower intensity, indicating ongoing variability and challenges in articulation. When compared to RP norms, Punjabi-speaking students generally show less intensity for /θ/ and/ð/ in start and medial positions. The decrease in articulatory patterns can be ascribed to the absence of dental fricatives in Punjabi, which results in phonological transfer effects. Pitch fluctuation, especially for / ð/, indicates how native phonetic patterns affect English pronunciation. Notably, constant intensity levels of the last position for /θ/ imply a higher level of proficiency, which could be attributed to phonetic training or exposure to English-speaking situations. On the other hand, the fluctuating strength of ð/ in the final position indicates persistent difficulties, highlighting the necessity of targeted pronunciation practice.

The results suggest that the absence of dental fricatives in Punjabi leads to significant difficulties in articulating these sounds in English. This finding is consistent with theories of second-language acquisition, which suggest that phonological elements not present in a learner's native language are more prone to errors. Given the persistent deviations in pitch and intensity, ESL educators should focus on these sounds through phonetic drills that raise awareness of the correct articulatory settings. Future research could examine the long-term effects of such interventions on phonological accuracy.

Exploring Fricative Variations:

The Impact of Punjabi Phonology on /s/ and /z / Pronunciation in English

When pronouncing the fricatives /s/ and /z/, it is clear that some Punjabi-speaking students depart from RP standards regarding both intensity and pitch. Forty-nine out of fifty pupils (85.7%) departed from the RP intensity norms for the fricative /s/ in the beginning position; twenty-four students (42.9%) showed lower intensity, and twenty-five students (43.9%) showed higher intensity. Every pupil deviated, although to different degrees, from the RP criteria regarding pitch. Forty-nine out of fifty pupils (85.7%) departed from RP intensity guidelines for the fricative /z/ in the beginning position; forty-eight students (71.4%) showed lower intensity, and one student (14.3%) showed higher intensity. In the same way, every student deviated from the requirements for the RP pitch, with notable differences seen among individuals.

The data showed that most Punjabi-speaking students pronounce the fricatives /s/ and /z/ differently than expected regarding intensity and pitch. These variations point to difficulties in faithfully replicating the auditory characteristics of these sounds, which elements like articulatory habits and language background may impact. These differences imply that Punjabi speakers find it challenging to continuously match RP norms' pitch and intensity levels. Due to potential differences in the phonetic systems of Punjabi and English, Punjabi-speaking pupils may find it difficult to precisely reproduce the acoustic qualities of English fricatives, as seen by the significant variation in intensity and pitch from RP standards. Punjabi and English have different phonological systems, which may make it difficult for Punjabi speakers to pronounce English fricatives like /s/ and /z/. Punjabi has trouble adjusting to changes in perception and articulation because it lacks some of the fricative contrasts seen in English. In some situations, English fricatives like /s/ and /z/ can be aspirated, meaning that a puff of air is released when pronounced. Punjabi speakers might find it challenging to make these sounds with the correct quantity of airflow because Punjabi does not normally have this kind of aspiration. The initial /s/ in "see" in English is spoken with the tongue positioned specifically against the alveolar ridge, giving rise to the distinctive fricative sound. However, in Punjabi, while a similar sound is represented by the letter (s), the tongue placement and articulatory approach might differ slightly. Punjabi speakers may also experience difficulties because of articulatory patterns and motor skills unique to their language, which might not match up precisely with the demands of English fricative production. Students who speak Punjabi may exhibit variations in intensity, pitch, and articulatory precision as a result. Students who speak Punjabi may have difficulties

understanding and effectively communicating in English-speaking situations due to the observed intensity and pitch changes in their /s/ and /z/ fricatives. These fricatives can cause misconceptions and make communication more difficult, especially in professional and academic contexts where speaking clearly is crucial.

The substantial variation in the pronunciation of /s/ and /z/ among Punjabi speakers indicates a challenge in adjusting to the finer acoustic details of these fricatives in English. The deviations observed, especially in professional and academic contexts, can lead to misunderstandings, emphasizing the need for more precise phonetic training. Phonetic exercises focusing on the contrast between voiced and voiceless fricatives could be incorporated into language learning curricula to enhance students' communicative competence in English.

Exploring Fricative Variations:

The Impact of Punjabi Phonology on /ʃ/and /ʒ/ Pronunciation in English

In the initial position (e.g., “Shoe”), none of the students closely followed the RP intensity standards (72.22 dB) for the fricative /ʃ/. Only one student (Respondent fifty) nearly reached the RP intensity level, while the others deviated with lower intensity levels. In the final position (e.g., “Push” and “Fish”), all students display lower intensity levels than RP standards, with none matching the RP intensity norms. There is variability among students in both initial and final positions regarding pitch, with some showing higher pitch levels compared to RP norms. For the fricative /ʒ/ in the medial position (e.g., “Measure”), a majority of students (forty-seven out of fifty) exhibit intensity levels surpassing RP standards (63.36 dB). Similarly, most students demonstrate pitch variations, with one student (Respondent fifty) notably diverging with a higher pitch than RP.

Punjabi-speaking students produce /ʃ/ with lower intensity levels than RP standards in both initial and final positions. This aligns with the phonological traits of Punjabi, where fricatives are typically softer. Pitch values for /ʃ/ also vary among students, with some displaying higher pitch levels than RP norms, indicating variability in articulating this fricative among Punjabi speakers. In the medial position, intensity values for /ʒ/ vary among Punjabi-speaking students, with some exceeding RP norms. Similarly, there is variability in pitch values, with significant deviations observed in some students, suggesting challenges in accurately reproducing intensity and pitch levels of English fricatives, especially in medial positions within words.

Punjabi speakers' difficulty in producing accurate /ʃ/ and /ʒ/ sounds likely stems from the softer articulation patterns prevalent in their native language, where fricatives are less forcefully articulated. It suggests that the articulatory setting of one's first language strongly influences second-language sound production. Given these findings, teachers should focus on increasing students' awareness of English fricative production in various contexts, while future studies could explore whether these patterns persist across different dialects of Punjabi or in other South Asian languages.

Exploring Fricative Variations:

The Impact of Punjabi Phonology on /h/ Pronunciation in English

Examining the glottal fricative /h/ in 50 Punjabi-speaking students compared to Received Pronunciation (RP) standards reveals interesting patterns in intensity and pitch. None of the students produced /h/ with intensity levels that matched the RP standard of 72.22 dB. In terms of pitch, the majority of students (forty-nine out of fifty) demonstrated values relatively close to the RP average of 0.129 Hz, with one student reaching the exact RP standard. Minor discrepancies were noticed in pitch levels among the students. In general, none of the students closely followed RP intensity guidelines for /h/, while about 86% (forty-nine out of fifty) approximated RP pitch standards. These results indicate that although most students could

mimic the RP pitch for /h/, they fell short of the required intensity levels, showing significant deviations from RP norms, especially in intensity. Punjabi-speaking students exhibited lower intensity levels and variations in pitch when producing the /h/ sound, indicating milder articulation than the RP standard.

The study supports the findings of Nasir (2022), who suggested, "in many languages, [ɦ] has no place or manner of articulation." Instead, it is described as a breathy-voiced counterpart of the following vowel from a phonetic perspective. Its characteristics are influenced by the preceding vowels and surrounding sounds, making breathy voice phonation its only consistent feature in such languages. This description aligns with the observed deviations in intensity and pitch among Punjabi-speaking students when producing /h/, highlighting the influence of native phonetic patterns on their English pronunciation (Nasir, 2022).

The observed deviations in /h/ pronunciation, particularly in terms of intensity, can be attributed to the breathy voice phonation that is characteristic of many South Asian languages, including Punjabi. Such breathiness reduces the forcefulness of articulation, resulting in lower intensity levels. This has significant implications for intelligibility, especially in fast-paced spoken interactions where subtle phonetic distinctions are critical. Therefore, future pronunciation programs should emphasize the production of English glottal fricatives to mitigate potential misunderstandings.

Conclusion

The present study emphasizes the significant influence of native phonological patterns on the pronunciation of English, primarily focusing on fricative sounds such as /f/, /v/, /θ/, /ð/, /s/, /z/, /ʃ/, /ʒ/, and /h/. The study shows consistent difficulties in meeting Received Pronunciation (RP) standards, particularly in intensity, with noticeable pitch variations in various cases. Dental fricatives /θ/ and /ð/ exhibit specific patterns of lower intensity and diverse pitch due to the absence of these sounds in Punjabi phonetics, leading to phonological transfer effects. Similarly, the glottal fricative /h/ and other fricatives like /f/ and /v/ are articulated with reduced intensity and pitch variations, highlighting the softer articulation tendencies in Punjabi.

The findings of this research indicate that Punjabi-speaking students who are learning English still need to receive formal education on the phonetics and phonology of either language. However, after studying English for an extended period, they were exposed to English consonants through their teachers and managed to imitate some quite accurately. On the other hand, they struggled with pronouncing certain consonants that had either been taught incorrectly by their teachers throughout their academic journey or were challenging due to the influence of their native language. The study's conclusion aligns with Lado's (1957) theory, suggesting that learners find it easier to grasp elements in a new language that resemble their mother tongue, while those that differ pose difficulties. The mispronunciation by these learners can be attributed to inadequate instruction on the phonetics of the target language or insufficient practice, particularly since their teachers, primarily non-native English speakers, hailed from Punjabi-speaking backgrounds.

Moreover, factors such as limited education and little exposure to English significantly contribute to the pronunciation challenges observed. Students from less educated or underprivileged backgrounds often need more opportunities to interact with English in their daily lives, resulting in limited familiarity and practice with English phonetics. This lack of exposure intensifies the difficulties caused by phonological transfer, as students have fewer examples of native English speech to follow. The findings stress the importance of targeted pronunciation training that tackles the specific phonetic hurdles faced by Punjabi learners. By addressing both intensity and pitch control, educators can improve the accuracy and clarity of English fricative production among these students. Customized teaching methods, based on a thorough understanding of native phonological influences and the socio-economic contexts of

the learners, can significantly enhance the pronunciation skills of Punjabi-speaking ESL learners, promoting more effective communication and reducing perceived accents in English-speaking settings.

Overall, the research underscores the crucial requirement for specialized phonetic training programs tailored to the unique difficulties Punjabi speakers encounter. These programs should prioritize the development of precise articulation and enhance the fluency and comprehensibility of English pronunciation. By addressing these linguistic subtleties and considering the socio-economic barriers that restrict exposure to English, educators can better assist Punjabi students in improving their proficiency in English fricatives and moving closer to RP standards.

Implication of the Study

The study's findings explain why Punjabi-speaking English students struggle to learn how to pronounce English consonants correctly. It also identified the consonants that pose a problem for these speakers. The current research offers some understanding and theoretical presumptions for language instructors and scholars. For all non-native English speakers, mastering the correct pronunciation of English consonants is a formidable challenge. Research in this field is still ongoing and needs careful consideration. The findings of this study recommend the following for educators and students:

1. Educators in the District of Kasur should focus on exercises that specifically target the control of intensity and pitch for consonant fricatives like /f/, /v/, /θ/, /ð/, /s/, /z/, /ʃ/, /ʒ/, and /h/. This could include using auditory feedback tools like PARAAT software, allowing students to visualize their pitch and intensity in real-time.
2. Teachers of district Kasur must incorporate training that emphasizes the exact placement and movement of speech organs, particularly for sounds that do not exist in Punjabi phonology. Techniques such as minimal pair drills and phonetic placement strategies can be effective.
3. Teachers can develop lessons highlighting the differences and similarities between Punjabi and English phonological systems. This can help students understand the areas where they need to adapt their articulation and phonation and use Punjabi examples to contrast with English sounds, aiding in more precise understanding and better retention of correct pronunciation patterns.
4. Additional support mechanisms should be developed for the District of Kasur students from less educated backgrounds, such as remedial pronunciation classes or language labs, to provide extra practice and assistance.
5. Families and communities should be encouraged to be involved in the learning process. Providing resources and training for parents can help create a supportive learning environment at home, especially for those less exposed to English.
6. Researchers in phonetics and phonology should conduct a detailed and elaborate study of English consonants for Punjabi speakers of English. Through research, weaker areas of Punjabi students can be identified and addressed adequately.
7. Other studies should illuminate the relevant segmental features of both English and Punjabi, such as diphthongs and triphthongs, and also elaborate upon the stress patterns of English for Punjabi speakers.
8. Future research should incorporate spectrographic analysis to provide a more detailed examination of the acoustic properties of speech sounds.
9. Researchers should extensively use PRAAT software to analyze a broader range of phonetic features beyond intensity, pitch, and duration. PRAAT offers tools for examining voice quality, formant frequencies, harmonic-to-noise ratios, and other nuanced acoustic

parameters that could further elucidate the specific phonetic challenges faced by Punjabi-speaking students.

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