

VOWEL SUBSTITUTION IN ENGLISH LOANWORDS: A PHONOLOGICAL AND ACOUSTIC ANALYSIS OF PUNJABI SPEAKERS IN SIALKOT

Kainat Sabir

kainatsabir86@gmail.com

M.Phil. Scholar University of Management and Technology, Sialkot, Pakistan

Dr. Ali Hussain

ali.hussain@skt.umt.edu.pk

University of Management and Technology, Sialkot, Pakistan

Abstract

This study investigates vowel substitution in the phonological adaptation of English loanwords among Punjabi speakers, focusing on how English vowel sounds are modified when integrated into the Punjabi phonological system. Grounded in Markedness Theory, the study adopts a mixed-methods approach and analyze 50 English loanwords produced by 50 native Punjabi speakers from Sialkot, Pakistan, selected through purposive sampling. Data were collected through a picture-naming task and analyzed using PRAAT software for acoustic measurement of vowel quality. The findings reveal that Punjabi speakers systematically modify English vowels to conform to native phonological constraints, replacing non-native vowels with the closest phonetic equivalents. Monophthong substitution emerges as the dominant strategy, while diphthongs and triphthongs are consistently simplified into monophthongs. Acoustic analysis further confirms measurable shifts in formant frequencies and vowel duration between English and Punjabi realizations. The study provides empirical acoustic evidence of vowel substitution and contributes to a deeper understanding of phonological adaptation in language contact contexts.

Keywords: Phonological adaptation, English loanwords, Punjabi speakers, vowel substitution, acoustic analysis

1. Introduction

Language contact between English and Punjabi has led to extensive borrowing of lexical items into everyday Punjabi speech, particularly in multilingual contexts such as Pakistan where English functions as an official and educational language (Bolton, 2008). However, borrowed words rarely retain their original phonological structure. Instead, they as maintained by Haugen (1950) and Kang (2011) undergo systematic modification to conform to the phonological constraints of the recipient language, a process widely recognized as phonological adaptation.

Among various adaptation strategies, vowel substitution plays a central role in reshaping English loanwords. Due to differences in vowel inventories and phonotactic patterns, Punjabi speakers frequently replace unfamiliar or complex English vowels with phonetically closer equivalents available in their native system. Such substitutions, as highlighted by Weinreich (1953) and Kang (2011) are not arbitrary but reflect systematic and rule-governed processes influenced by the structural properties of Punjabi phonology.

Cross-linguistic differences between English and Punjabi further explain this phenomenon. English possesses a relatively large and complex vowel system, including both monophthongs and diphthongs (Roach, 2009), whereas Punjabi has a comparatively smaller and more stable vowel inventory (Gill & Gleason, 1962; Karamat, 2002). As a result, vowel contrasts present in English are often neutralized or simplified during borrowing, leading to consistent patterns of vowel substitution.

This study focuses specifically on examining vowel substitution patterns in English loanwords used by Punjabi speakers. Drawing on Markedness Theory, which posits that speakers tend to favor less marked and more natural phonological structures

(Kenstowicz, 1994), the study aims to explain how and why certain vowel substitutions occur during the adaptation process.

1.1 Research Objective

i. To examine and analyze the patterns of vowel substitution in English loanwords produced by Punjabi speakers.

1.2 Research Question

i. How do Punjabi speakers adapt English vowels through systematic vowel substitution?

2. Literature Review

2.1 Language Contact and Borrowing

Language contact plays a central role in shaping linguistic systems, particularly through borrowing processes. When speakers of different languages interact, lexical items are frequently transferred from a donor to a recipient language (Haspelmath, 2009; Thomason, 2003). English, as a global lingua franca, has contributed extensively to the lexicons of many languages, including Punjabi, especially in multilingual societies such as Pakistan (Crystal, 1997; Ziveng, 2009).

Borrowing is not merely lexical transfer; it involves structural adaptation. Haugen (1950) defines borrowing as the reproduction of linguistic patterns from one language into another, often accompanied by phonological modification. Similarly, Weinreich (1953) argues that borrowed items undergo changes in form and structure depending on the compatibility between the donor and recipient language systems.

2.2 Phonological Adaptation in Loanwords

Loanword adaptation refers to the process through which borrowed words are modified to conform to the phonological system of the recipient language (Haspelmath, 2009; Winford, 2010). These adaptations occur because of structural mismatches between the phonemic inventories and phonotactic constraints of the two languages. At the segmental level, non-native sounds are typically replaced by the closest equivalents available in the native phonological inventory (Hock & Joseph, 2009). Kang (2010) further explains that phonological adaptation affects multiple levels, including segments, syllable structure, and prosodic features.

In the case of Punjabi, Mahmood et al. (2011) demonstrate that English loanwords are systematically modified to align with Punjabi phonological constraints. These modifications include vowel substitution, consonant substitution, and epenthesis, reflecting rule-governed adaptation rather than random variation.

2.3 Vowel Substitution as an Adaptation Strategy

Vowel substitution is one of the most prominent strategies in loanword adaptation, particularly when the vowel systems of the donor and recipient languages differ significantly. English has a relatively large and complex vowel inventory, including multiple diphthongs, whereas Punjabi has a comparatively smaller and more stable vowel system (Roach, 2009; Gill & Gleason, 1962).

Due to this mismatch, Punjabi speakers tend to replace unfamiliar English vowels with phonetically similar native vowels. According to Hock (1991), such substitutions are driven by phonemic inventory constraints, where absent vowels are approximated using the closest available sounds.

Romaine (2009) notes that diphthongs are often simplified into monophthongs in borrowing languages with simpler vowel systems. This phenomenon is evident in Punjabi, where English diphthongs such as /eɪ/ and /aɪ/ are reduced to monophthongs

like /e:/ or /æ/ (Mahmood et al., 2011). For example, the word “cake” is realized with a simplified vowel, while “line” may undergo substitution reflecting Punjabi vowel constraints.

These substitutions are not arbitrary; they are guided by phonetic similarity, perceptual ease, and phonotactic compatibility (Peperkamp & Dupoux, 2003). Speakers interpret unfamiliar sounds through the filter of their native phonological system, resulting in systematic vowel replacement patterns.

2.4 Theoretical Perspectives on Vowel Adaptation

Two major approaches explain vowel substitution in loanword phonology: the perceptual approach and the phonological approach.

The perceptual approach argues that adaptations occur due to how speakers perceive foreign sounds through their native phonological system (Peperkamp & Dupoux, 2003). When English vowels are not perceptually distinct for Punjabi speakers, they are mapped onto the nearest native vowel categories.

In contrast, the phonological approach emphasizes production constraints, suggesting that speakers actively modify loanwords to fit their native phonotactic rules (Paradis & LaCharité, 1997).

Additionally, Markedness Theory provides a strong explanatory framework for vowel substitution. According to this theory, marked (complex or less common) sounds tend to be replaced by unmarked (simpler, more natural) ones (Rice, 2007; de Lacy, 2006). In the context of Punjabi, complex English vowels such as diphthongs are often replaced by simpler monophthongs, reflecting a preference for unmarked structures.

2.5 Punjabi Context of Vowel Adaptation

In Punjabi, vowel substitution is strongly influenced by phonological constraints and speaker familiarity with English. Mahmood et al. (2011) highlight that Punjabi speakers systematically adapt English vowels to maintain ease of articulation and intelligibility. Furthermore, the adaptation process is shaped by bilingualism and exposure. Speakers with limited exposure to English tend to produce more simplified vowel forms, whereas bilingual speakers may retain closer approximations to the original pronunciation (Hussain et al., 2012).

These findings indicate that vowel substitution is not only structurally motivated but also influenced by sociolinguistic factors such as language proficiency and exposure.

2.6 Research Gap

While loanword phonology has been extensively explored in various languages, the Punjabi context remains comparatively under-researched, particularly with regard to vowel substitution. Previous studies on Punjabi loanword adaptation have primarily addressed general phonological processes, offering limited insight into systematic vowel replacement patterns.

Moreover, the structural differences between English and Punjabi vowel inventories, including the complexity of English diphthongs and the relatively simpler Punjabi vowel system, have not been sufficiently analyzed in existing research. This lack of focused investigation highlights a gap in understanding how vowel substitution operates as a primary adaptation strategy in Punjabi.

3. Methodology

This study employs a mixed-methods descriptive approach, integrating quantitative analysis with qualitative phonological interpretation to examine vowel substitution patterns in English loanwords adapted by Punjabi speakers in Sialkot, Punjab, Pakistan. A total of 50 native Punjabi speakers were selected through purposive sampling, representing a mixed gender group aged between 15 and 55 years. The

participants were grouped in 10 groups of native Punjabi speakers with each group having 5 participants, representing grassroots language use. Moreover, each group were given 5 words to pronounce.

The dataset consisted of 50 frequently used English loanwords, deliberately selected based on their likelihood to exhibit vowel substitution during adaptation into Punjabi phonology. Data were collected through a picture-naming task, which encouraged spontaneous and natural pronunciation of the target words while minimizing orthographic influence.

Participants were presented with visual prompts and their responses were recorded for analysis. The recorded data were analyzed using PRAAT (version 6.4.12), focusing specifically on vowel quality through acoustic measurements of formant frequencies (F1 and F2), allowing for precise identification of substitution patterns. Ethical standards were maintained throughout the study, with informed consent obtained from all participants and anonymity ensured in the handling of recorded data.

4. Theoretical Framework

This study is grounded in Markedness Theory, originally proposed by Jakobson and Trubetzkoy within the Prague School of Linguistics. The theory distinguishes between marked (complex, less frequent) and unmarked (simple, more frequent) linguistic elements, providing a systematic framework for analyzing phonological adaptation (Trubetzkoy, 1939/1969; Battistella, 1990). Markedness is language-specific (Rice, 2007), making it particularly relevant for analyzing loanword adaptation. In the case of Punjabi, differences between English and Punjabi vowel systems result in systematic vowel substitution, where complex English vowels especially diphthongs are replaced with simpler Punjabi equivalents.

These substitutions reflect the tendency to reduce marked structures, consistent with Eckman's (1977) Markedness Differential Hypothesis, which predicts greater difficulty and modification of marked forms. Similarly, De Lacy (2006) argues that phonological systems favor the simplification of marked elements unless constrained otherwise. Thus, vowel substitution in Punjabi loanwords is not arbitrary but governed by markedness-driven preferences that align borrowed forms with native phonological constraints.

5. Data Analysis

The most common scheme of an adaptation is revealed to be vowel replacement in history. This predominance is a sign of the great contrasts between English and Punjabi vowel systems especially when it comes to the aspects of quality, quantity and diphthong realization. The vowel system of English is more complex in terms of the quantity of vowel qualities, whereas, Punjabi is more limited in terms of diversity of vowel quality distinctions and systematic vowel length.

The regularities of vowel replacements are found on correspondence principles of acoustic similarity and phonological markedness. English vowels with no direct counterparts in the Punjabi are always substituted by the nearest match possible in the target language system given in terms of formant frequencies and locally comparable articulatory configurations.

5.1 Monophthong Substitution Patterns

There is a systematic adaptation of the features of English monophthongs by the Punjabi speakers in their speech based on height, backness, and rounding features of the category. The adaptation makes the use of systematic correspondence rules:

5.1.1 Back Vowels

Substitution of the back vowel /ɒ/. Punjabi does not have an exact equivalent for the English /ɒ/ sound, which is a rounded back vowel so speakers adapt it using the closest available phoneme, which is /ɑ:/. While Punjabi /ɑ:/ retains the [+back] and [+low] characteristics but does not have lip rounding, whereas English /ɒ/ is distinguished by low back rounded articulation. This suggests that in terms of adaptation, Punjabi speakers value height and backness more than roundness.

Table 5.1: Systematic adaptation of English /ɒ/ to Punjabi /ɑ:/, showing consistent unrounding and centralization patterns in loanword phonology.

Sr. #	Items in English	Transcription in English	Transcription in Punjabi
1	Doctor	dɒktə	dɑ:ktər
2	Chocolate	tʃɒklət	tʃɑ:klət
3	Wallet	wɒlɪt	wɑ:lət
4	College	kɒlɪdʒ	kɑ:lədʒ
5	Block	blɒk	blɑ:k
6	Locker	lɒkə	lɑ:kər

Substitution of the back vowel /ɔ:/. Punjabi phonology often lacks rounded back vowels, particularly those that are both rounded and long, like /ɔ:/. The substitution of /ɔ:/ with /ɑ:/ reflects Punjabi speakers' tendency to use unrounded vowels when adapting foreign sounds that do not have an exact equivalent in Punjabi. The systematic nature of phonological integration is highlighted by Habib and Khan (2022) who highlight that vowel substitution in Punjabi loanwords follows predictable patterns with /ɔ:/ consistently mapped to /ɑ:/.

Table 5.2: Examples of English /ɔ:/ adaptation showing systematic substitution with unrounded Punjabi vowels, reflecting phonemic inventory constraints.

Sr. #	Items in English	Transcription in English	Transcription in Punjabi
1	Call	kɔ:l	kɑ:l
2	Record	rekɔ:d	rəkɑ:d
3	Mall	mɔ:l	mɑ:l
4	Lawn	lɔ:n	lɑ:n
5	Torch	tɔ:tʃ	tɑ:rtʃ
6	Ball	bɔ:l	bɑ:l

5.1.2 Central Vowels

Substitution of the central long vowel /ɜ:/. This central long vowel /ɜ:/ is more commonly substituted with /ər/ and sometimes with /e/ by Punjabi speakers. The absence of a tense mid-central vowel in Punjabi leads to this substitution. The articulatory requirement of /ɜ:/ which involves partial rounding and tense mid-central tongue positioning is incompatible with Punjabi's vowel system. Since it mimics the

centralized and rounded quality of /ɜ:/, the combination of a schwa /ə/ and the rhotic /r/ instead provides an accessible substitute.

Table 5.3: *Substitution patterns for English central vowel /ɜ:/, showing preference for rhotic realizations /ər/ and occasional lateral variants /əl/.*

Sr. #	Items in English	Transcription in English	Transcription in Punjabi
1	Service	sɜ:vɪs	sərvɪs
2	Church	tʃɜ:tʃ	tʃərtʃ
3	Expert	ekspɜ:t	ekspərt
4	Shirt	ʃɜ:t	ʃərt / ʃəlt
5	Clerk	klɜ:k	klərk

5.1.3 Front Vowels

Substitution of the front vowel /ɪ/. The front vowel /ɪ/ is substituted with mid central vowel schwa /ə/ when incorporated by Punjabi speakers. This happens because /ə/ is the closest option in Punjabi phonological system as the language lacks a clear high lax front vowel equivalent to /ɪ/. In order to facilitate smoother articulation, Punjabi speakers naturally centralize unfamiliar vowel sounds and adjust them with the native phonemic inventory.

Table 5.4: *Systematic centralization of English /ɪ/ to schwa /ə/ in unstressed positions, demonstrating vowel reduction patterns in Punjabi loanword adaptation.*

Sr. #	Items in English	Transcription in English	Transcription in Punjabi
1	Cricket	kɪkɪt	kɪkət
2	Practice	præktɪs	præktəs
3	Pencil	pensɪl	pensəl
4	Limit	lɪmɪt	lɪmət
5	Message	mesɪdʒ	mesədʒ
6	College	kɒlɪdʒ	kɒlədʒ

5.2 Diphthong Adaptation Patterns

The English diphthongs are systematically adapted since the Punjabi phonology has no diphthongs and triphthongs. This is a controversial region of the Punjabi phonology having diphthongs or not, although, there are some indications that the speakers of Punjabi replace diphthongs and triphthongs with monophthongs as their native language did not have such complex vowel sounds. The hardship concerning diphthong articulations when speaking Punjabi is due to the nature of unfamiliarity with manual control of the tongue in order to approximate the gliding sound obtained with diphthong.

5.2.1 Substitution of the closing diphthong /aɪ/. There is no such diphthong as /aɪ/ in Punjabi, and speakers replace it by the closest possible vowel sound. Rather than going through a single syllable between one vowel sound to another sound (a diphthong), the Punjabi speakers adopt the sound to lessen it to solitary vowel /æ/. Given that diphthongs are thought to be more marked than monophthongs, this process reflects the larger cross-linguistic tendency to simplify complex vowel structures (Calabrese, 2005).

Table 5.5: *Systematic simplification of English /aɪ/ to Punjabi /æ/, demonstrating the absence of diphthongs in Punjabi phonological adaptation.*

Sr. #	Items in English	Transcription in English	Transcription in Punjabi
1	Mobile	məʊbaɪl	mʊbæɪl
2	Tile	taɪl	tæɪl
3	Cycle	sɑɪkəl	sækəl
4	Line	laɪn	læn
5	Side	sɑɪd	sæd
6	Sprite	spraɪt	spræt
7	Light	laɪt	læt

5.2.2 Substitution of /əʊ/ by /o:/. In Punjabi loanword adaptation, the long mid-back monophthong /o:/ systematically replaces the English diphthong /əʊ/ which smoothly transitions from a mid-central to a high back rounded position. This substitution offers a stable vowel quality more in line with the native phonetic system while avoiding the diphthongal movement that is lacking in Punjabi.

Table 5.6 : *Monophthongization patterns showing systematic conversion of English /əʊ/ to long monophthong /o:/, reflecting Punjabi phonological preferences.*

Sr. #	Items in English	Transcription in English	Transcription in Punjabi
1	Hotel	həʊtel	ho:tel
2	Vote	vəʊt	vo:t
3	Glow	gləʊ	glo:
4	Motor	məʊtə	mo:tər
5	Toast	təʊst	to:st
6	Go	gəʊ	go:
7	Shadow	ʃædəʊ	ʃædo:

5.2.3 Substitution of /eɪ/ by /e:/. Punjabi speakers omit the second element and lengthen the first element to /e:/ in this closing diphthong. In Punjabi phonology, closing diphthongs that move from a mid-front to a high-front position like /eɪ/ are not allowed. In the Punjabi system, speakers lengthen the nucleus /e/ to /e:/ and eliminate the off-glide /ɪ/ to accommodate this sound. A monophthongal realization that is more in line with the Punjabi vowel inventory is the outcome of this process.

Table 5.7: Examples of diphthong reduction showing systematic lengthening of the first element while eliminating the glide component.

Sr. #	Items in English	Transcription in English	Transcription in Punjabi
1	Face	feɪs	fe:s
2	Train	treɪn	tre:n
3	Cake	keɪk	ke:k
4	Date	deɪt	de:t
5	Save	seɪv	se:v
6	Paper	peɪpə	pe:pər

5.2.4 Substitution of /aʊ/ by /o:/. Punjabi phonology lacks the English diphthong /aʊ/ which is a change from an open front vowel [a] to a high back rounded glide [ʊ]. The long mid-back monophthong /o:/ is used by Punjabi speakers in place of the diphthong to accommodate this strange sequence. The [+back] and [+round] characteristics of the target diphthong are preserved in this substitution which also makes its articulatory complexity simpler. This replacement of /aʊ/ with long vowel /o:/ shows that how Punjabi speakers avoid using diphthongal movement and prefer monophthongs.

Table 5.8: Systematic replacement of English /aʊ/ with rounded long vowel /o:/, highlighting preference for monophthongs

Sr. #	Items in English	Transcription in English	Transcription in Punjabi
1	Powder	paʊdə	po:dər
2	Ground	graʊnd	gro:nd
3	Doubt	daʊt	do:t
4	Pound	paʊnd	po:nd

5.3 Triphthong Adaptation

Triphthongs due to its complex sequence are not part of Punjabi phonology, due to which Punjabi speakers simplifies triphthongs into monophthongs or diphthongs, depending on their articulation ease and phonotactic limitations. For example, the word 'fire' is realised as /fæɪr/, where triphthong /aɪə/ is simplified to monophthong /æ/. This reduction of complex nuclei reflects preference of Punjabi speakers for simpler syllable structures (CV or CVC).

Table 5.9: Examples of complex triphthong adaptation showing systematic reduction to simple monophthongs, reflecting Punjabi constraints on vowel complexity.

Sr. #	Items in English	Transcription in English	Transcription in Punjabi
1	Fire	faɪə	fæɪr
2	Player	pleɪə	ple:r
3	Tire	taɪə	tæɪr
4	Power	paʊə	pa:r

5.4 PRAAT Analysis of Vowel Substitution

In this section, the word “doctor” has been acoustically analyzed. Formant frequency analysis is used to provide acoustic details of patterns of vowel substitution. F1 and F2 scores indicate that there are systematic correlations between English targets and Punjabi realizations:

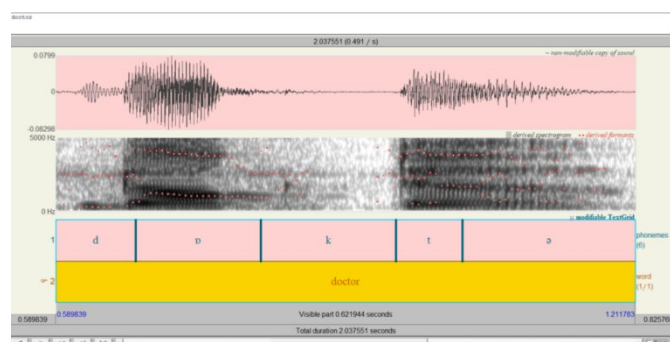


Image 5.1 : Spectrogram of English “doctor” showing back rounded vowel /ɒ/ (standard pronunciation).

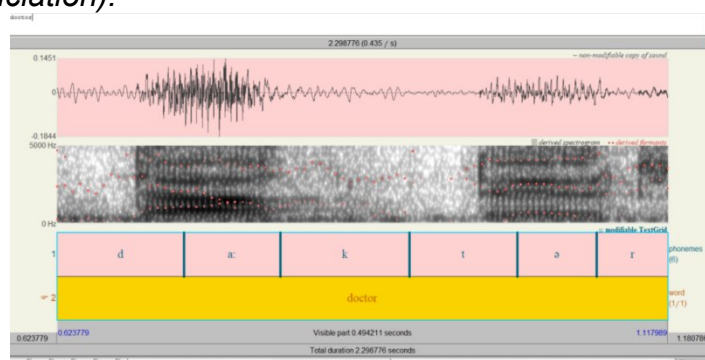


Image 5.2 : Spectrogram of “doctor” showing substitution of /ɒ/ with long unrounded vowel /ɑ:/ (Punjabi realization).

The change of English /ɒ/ to /ɑ:/ in Punjabi is the vowel change pattern that is most systematic in these two languages because they do not coincide in the level of vowels. Formant frequency measurements are the only way the acoustical study can illuminate this qualitative change.

The acoustic characteristics of a rounded back sound are typical of the sound /ɒ/ in the regular speech of the English speaking population. PRAAT analysis shows that the above vowel has F1 = 652 and F2 = 1108 Hz which is in low back region of the vowel space. The small F1 value indicates that the vowel is of moderate height (mid-low) and the small F2 value indicates that the tongue position is at the back. It has an acoustic length of 134 milliseconds, which is pretty typical of the English monophthongs in stressed syllables. There is well-developed formant structure with good F1 and F2, and low F3 around 2300 Hz, which strongly indicates lip rounding in the spectrogram.

The resulting adaptation of “doctor” in Punjabi is related to the systematic sound changes that are circumscribed by the substitution of long vowel /ɑ:/. Formant analyses reveal that F1 = 748 Hz, and F2 = 1324 Hz produce a considerable change in the quality of vowels. These changes in F2- (96 Hz) and F2- (216 Hz) indicate more central tongue position and more open tongue position, respectively. This difference

in formant frequency highlights that how Punjabi speakers /ɑ:/ is not rounded and central-low while English speakers /ɒ/ is rounded and back.

Systematic differences confirmed by measurements of duration:

- English diphthongs: 150-180 ms
- Punjabi long vowel substitutes: 180-220 ms
- Punjabi short vowel substitutes: 80-120 ms

5.4.1 Theoretical Framework Application to Vowel Substitution

Replacement of English back rounded vowel /ɒ/ with Punjabi low unrounded long vowel /ɑ:/ provides a perfect example of how Punjabi speakers' favour markedness-driven modification. As per Markedness theory, this vowel /ɒ/ is typically considered complex and marked due to its combination of [+back], [+low] and [+round]. However, on the other hand, in replacement of this vowel /ɒ/, Punjabi speakers use /ɑ:/ which is considered simpler and less marked as it avoids lip rounding. While however, it maintains the characteristic of [+low] and [+back]. This highlights how unmarked vowels are universally accepted while modifying loanwords.

6. Conclusion

The study demonstrates that vowel substitution in Punjabi loanword phonology is systematic and rule-governed. Punjabi speakers consistently modify English vowel sounds to conform to the phonological constraints of their native language, guided by acoustic similarity, articulatory ease, and phonological markedness. Monophthong substitution emerges as the dominant strategy, particularly in the adaptation of back and central vowels, while diphthongs and triphthongs are simplified into monophthongs. These patterns reflect a strong preference for stable and less complex vowel structures within Punjabi phonology.

Importantly, these variations that are derived from the recorded responses of participants, highlights authentic patterns of pronunciation in natural speech. Acoustic analysis further supports these findings by demonstrating measurable shifts in formant frequencies and vowel duration between English source forms and Punjabi realizations. Overall, the study confirms that vowel substitution in Punjabi is predictable and systematically governed by native phonological constraints, contributing to a clearer understanding of sound adaptation in language contact contexts.

References

- Battistella, E. L. (1990). *Markedness: The evaluative superstructure of language*. State University of New York Press.
- Bhatia, T. K. (1993). *Punjabi: A cognitive-descriptive grammar*. Routledge.
- Bolton, K. (2008). English in Asia, Asian Englishes, and the issue of proficiency. *English Today*, 24(2), 3–12.
- Calabrese, A. (2005). *Markedness and economy in a derivational model of phonology*. Mouton de Gruyter.
- Crystal, D. (1997). *English as a global language*. Cambridge University Press.
- de Lacy, P. (2006). *Markedness: Reduction and preservation in phonology*. Cambridge University Press.
- Eckman, F. R. (1977). Markedness and the contrastive analysis hypothesis. *Language Learning*, 27(2), 315–330. <https://doi.org/10.1111/j.1467-1770.1977.tb00124.x>
- Gill, H. S., & Gleason, H. A. (1962). *A reference grammar of Punjabi*. OUP.
- Habib, R., & Khan, A. (2022). Vowel substitution patterns in Punjabi loanword phonology. *Journal of Linguistics Studies*, 2(2), 261-182.

- Haspelmath, M. (2009). Lexical borrowing: Concepts and issues. In M. Haspelmath & U. Tadmor (Eds.), *Loanwords in the world's languages: A comparative handbook* (pp. 35–54). De Gruyter Mouton.
- Haugen, E. (1950). The analysis of linguistic borrowing. *Language*, 26(2), 210–231.
- Hock, H. H. (1991). *Principles of historical linguistics* (2nd ed.). Mouton de Gruyter.
- Hock, H. H., & Joseph, B. D. (2009). *Language history, language change, and language relationship: An introduction to historical and comparative linguistics*, (2nd ed.). Mouton de Gruyter.
- Hussain, S., Mahmood, R., & Asghar, A. (2012). Phonological adaptation of English loanwords in Punjabi. *Language in India*, 12(2), 1–15.
- Kang, Y. (2010). Loanword phonology. In M. van Oostendorp et al. (Eds.), *The Blackwell companion to phonology*. Wiley-Blackwell.
- Kang, Y. (2011). Loanword phonology. In J. Goldsmith, J. Riggle, & A. Yu (Eds.), *The handbook of phonological theory* (2nd ed., pp. 225–258). Wiley-Blackwell.
- Karamat, N. (2002). *Punjabi phonology*. (Unpublished manuscript).
- Kenstowicz, M. (1994). *Phonology in generative grammar*. Blackwell.
- Mahmood, R., Hussain, S., & Mahmood, A. (2011). Phonological adaptation of English loanwords in Punjabi. *International Journal of Linguistics*, 3(1), 1–15.
- Paradis, C., & LaCharité, D. (1997). Preservation and minimality in loanword adaptation. *Journal of Linguistics*, 33(2), 379–430.
- Peperkamp, S., & Dupoux, E. (2003). Reinterpreting loanword adaptations: The role of perception. In M.-J. Solé et al. (Eds.), *Proceedings of the 15th International Congress of Phonetic Sciences*, (pp. 367–370).
- Rice, K. (2007). Markedness in phonology. In P. de Lacy (Ed.), *The Cambridge handbook of phonology*, (79–97). Cambridge University Press.
- Roach, P. (2009). *English phonetics and phonology: A practical course*, (4th ed.). Cambridge University Press.
- Thomason, S. G. (2003). Contact as a source of language change. In R. D. Janda & B. D. Joseph (Eds.), *The handbook of historical linguistics*, (pp. 687–712). Blackwell.
- Trubetzkoy, N. S. (1969). *Principles of phonology*, (C. A. M. Baltaxe, Trans.). University of California Press. (Original work published 1939)
- Weinreich, U. (1953). *Languages in contact: Findings and problems*. Linguistic Circle of New York.
- Winford, D. (2010). Contact and borrowing. In R. Hickey (Ed.), *The handbook of language contact*, (170–187). Wiley-Blackwell.
- Zivenge, E. (2009). The impact of English on Shona: A case study of loanwords. *Journal of Pan African Studies*, 3(1), 1–12.