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To cite this article. B. Khan, M. Asad, and M. Zahid, “Consonantal Variation of Hindi-Urdu Loanwords in Standard English : A Phonological Analysis,” *Lang. Technol. Soc. Media*, vol. 2, no. 2, pp. 145–159, 2024.

DOI: <https://doi.org/10.70211/ltsm.v2i2.77>

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Consonantal Variation of Hindi-Urdu Loanwords in Standard English: A Phonological Analysis

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Received: 10 August 2024

Revised: 26 October 2024

Accepted: 2 November 2024

Online: 3 November 2024

Abstract

This study explores the complex phonological transformations involved in adapting Hindi-Urdu loanwords into Standard English. Examining a corpus of approximately 300 loanwords, this research identifies systematic phonological changes such as deaspiration, devoicing, deretroflexion, and deuvularization that align these borrowed words with English phonotactic norms. For instance, Hindi-Urdu aspirated sounds typically lose aspiration in English, while retroflex consonants shift to alveolar positions, reflecting the structural requirements of English phonology. These transformations underscore the adaptability of Hindi-Urdu phonemes in response to English phonetic constraints, facilitating smoother integration into the English sound system. Additionally, deviations from expected patterns, or “misiterations,” reveal the influence of perceptual and sociolinguistic factors that add complexity to the adaptation process. By focusing on consonantal changes specifically, this study fills a gap in the literature on phonological adaptation in cross-linguistic contexts, particularly between Indo-Aryan and Germanic languages. The findings provide a detailed view of consonantal adjustments that occur in loanwords, enhancing our understanding of language contact dynamics. This research also suggests new interdisciplinary avenues for exploring phonological adaptation by incorporating cognitive and sociolinguistic perspectives to further analyze the complexities of loanword integration.

Keywords: Phonological Adaptation; Hindi-Urdu Loanwords; English Phonology; Consonantal Change; Language Contact

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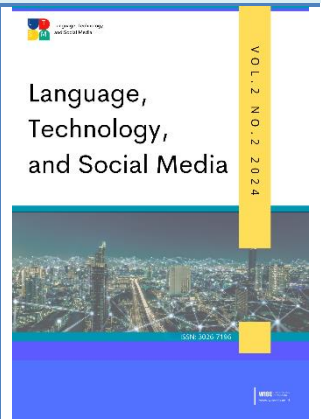
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INTRODUCTION

The shared history between Britain and India has had a profound impact on both cultures, particularly in the realm of language. One of the most evident outcomes of this historical interaction is the extensive lexical borrowing that has enriched both English and Hindi-Urdu. Lexical borrowing, or the adoption of words from one language into another, often reflects deeper cultural, social, and economic exchanges between communities. As Danica Salazar [1], World English Editor for the *Oxford English Dictionary* (OED), stated in the release notes from 2017, "Seventy words originating from and chiefly used in Indian English have been added to the OED in this latest update", which highlights the continuous enrichment of English with loanwords from Indian languages. The phonological and lexical adaptation of loanwords, however, goes beyond mere addition to the lexicon; it reveals intricate processes of language contact, cultural interaction, and phonological adjustments that occur during borrowing.

Loanwords from Hindi-Urdu, which belong to the Indo-Aryan language family, have significantly impacted the English lexicon. Despite the orthographic differences between Hindi (written in Devanagari) and Urdu (written in a modified Perso-Arabic script), both languages share a high degree of mutual intelligibility and cultural overlap. Numerous studies have documented the lexical contributions of Hindi-Urdu to English, including everyday terms like *bungalow*, *jungle*, *chutney*, and *avatar*, which are now commonly used in English. Such loanwords reflect both historical trade and colonial exchanges [2], [3]. However, lexical borrowing is only one aspect of the influence of Hindi-Urdu on English; the phonological transformations that accompany loanword adaptation also play a critical role in understanding the dynamics of linguistic borrowing. Previous studies have explored the process of loanword adaptation from various linguistic perspectives. Research by Ahmed Hamid Abdulrazzaq and Sundus Muhsin al-Ubaidy [4] and Pethias Siame et al. [5] has shed light on the phonological and morphological changes that loanwords undergo when integrated into a recipient language. In particular, there is research in the field of computational linguistics that has provided valuable tools for analyzing variation and change in loanword usage across different linguistic contexts [6], [7], [8]. Despite the existence of a broad literature on loanwords in general, particularly in English, the phonological adaptation of Hindi-Urdu loanwords has been relatively underexplored, especially in terms of consonantal variation. This research seeks to fill this gap by focusing on the consonantal sound changes in Hindi-Urdu loanwords and how they are adapted into the English phonological system, a topic that has not received sufficient attention in prior studies (see Figure 1).

#vl → voiceless, #vd → voiced, #unasp → unaspirated & #asp → aspirated sounds

Consonant Type	Aspiration	Bilabial		Labio-dental		Alveolar		Dental		Retroflex		Palatal		Velar		Uvula		Glottal	
		vl	vd	vl	vd	vl	vd	vl	vd	vl	vd	vl	vd	vl	vd	vl	vl	vd	
		Stop	Unasp	p	b					t̪	d̪	ʈ	ɖ			k	g	q	
	Asp	p ^h	b ^h					t ^h	d ^h	t̪ ^h	d̪ ^h			k ^h	g ^h				
Affricate	Unasp											tʃ	dʒ						
	Asp											tʃ ^h	dʒ ^h						
Fricative	Unasp			f		s	z			ʃ		ʒ	x	ɣ				ɦ	
Nasal	Unasp	m						n		ɳ				ŋ					
Trill	Unasp											r							
Flap	Unasp									ɾ									
	Asp									ɾ ^h									
Approximant	Unasp					v	l					y							

Figure 1. The Hindi-Urdu Consonant Phonemes [9]

Phonologically, Hindi and Urdu differ in several ways from English, particularly in terms of consonantal clusters. Hindi, for instance, allows consonant clusters at the beginning of a syllable, such as /kr/, /st/, and /ʃr/, whereas Urdu restricts such clusters [10], [11], [12]. English, on the other hand, is more permissive in allowing complex consonantal onsets and codas. Borrowed words from Hindi-Urdu often undergo phonological adaptation to align with the constraints of English phonotactics. In terms of final syllable positions, Hindi-Urdu exhibits a variety of consonant clusters, such as Stop + Stop (/vʌqʈ/ ‘time’) and Stop + Fricative (/lotʃ/ ‘enjoyment’) [13], [14], while English allows clusters of up to four consonants (e.g., *texts* /teksts/), as illustrated in Figure 2. The adaptation of these clusters during the borrowing process represents a key area where phonological change is evident, yet little has been done to systematically analyze these shifts in the context of Hindi-Urdu loanwords in English.

#vl → voiceless, #vd → voiced

Consonant Type	Bilabial		Labio-dental		Dental		Alveolar		Palatal-alveolar		Palatal		Velar		Glottal	
	vl	vd	vl	vd	vl	vd	vl	vd	vl	vd	vl	vd	vl	vd	vl	vd
	Stop	p	b					t	d					k	g	
Fricative			f	v	θ	ð	s	z	ʃ	ʒ						h
Affricate											tʃ	dʒ				
Nasal		m					n							ŋ		
Lateral							l									
Approximant	w									r		y				

Figure 2. English Consonant Phonemes [9]

Many previous works have focused on the socio-cultural and historical contexts of lexical borrowing, such as the studies of loanwords in Japanese [15] and Korean [16]. While these studies have contributed valuable insights into the sociolinguistic aspects of loanword usage, they do not

delve into the phonological processes involved in the adaptation of loanwords from Hindi-Urdu into English. This study, therefore, represents a novel contribution by specifically addressing the consonantal phonological changes in Hindi-Urdu loanwords as they are assimilated into the English sound system. The novelty of this research lies in its focus on the underexplored area of consonantal adaptations in loanwords, particularly from Hindi-Urdu into English. While previous studies have examined loanwords from other language pairs, such as Spanish loanwords in Hopi [17] and Arabic loanwords in Amharic [18], this study contributes new insights into the phonological processes that Hindi-Urdu loanwords undergo when borrowed into English. By focusing on consonantal changes, this research not only fills a gap in the current body of knowledge but also provides a more nuanced understanding of the dynamics of linguistic borrowing, particularly in the context of Germanic and Indo-Aryan language contact. The study's findings are expected to have broader implications for theories of phonological adaptation and language contact in multilingual settings. In conclusion, this study investigates the phonological changes that occur in Hindi-Urdu loanwords, specifically focusing on consonantal sound changes during their adaptation into the English language. This research aims to contribute to the broader understanding of loanword adaptation by providing a detailed analysis of how phonological processes shape the integration of loanwords across different language systems. Through this investigation, the study enhances the existing literature on language contact and loanword phonology, offering new insights into the complexities of linguistic borrowing between Hindi-Urdu and English.

METHODS

For this study, a mixed-methods approach is employed to comprehensively investigate Hindi-Urdu loanwords in Standard English. This approach integrates both qualitative and quantitative methods to provide a multifaceted understanding of the phenomenon.

Data Collection

The data were randomly collected through in-depth analysis of texts, including literature, media, and online sources. Then, these data were verified and checked against the Oxford Learner's Dictionary to ensure that the Hindi-Urdu glossary terms were included in the Oxford English Dictionary [2], [19], [20]. Additionally, some Hindi-Urdu loanwords were cross-referenced with the Collins English Dictionary [21] to identify Hindi-Urdu loanwords in Standard English usage. This process involved scrutinizing the context, usage, and cultural connotations of the identified loanwords.

Data Samples

The data sample comprised approximately 300 Hindi-Urdu loanwords that have been integrated into the Standard English language. These loanwords are predominantly content words, especially nouns. These loanwords were specifically chosen to facilitate a comprehensive phonological analysis, focusing on consonantal changes in English syllable structure and their pronunciation within the English phonetic system.

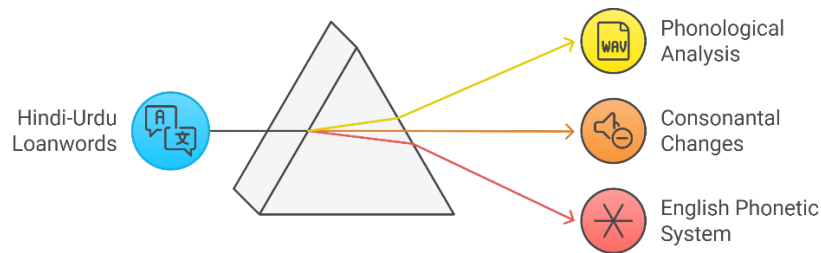


Figure 3. Consonantal Shifts in Loanwords

Data Analysis

We analyzed these loanwords to identify various phonological transformations, including alternations such as deaspiration, deaffrication, devoicing, deretroflexion, and devularization. We further observed consonantal shifts like interdentalization, dental to alveolarization, and labiodental to labial changes. The process of substitution was also witnessed as bilabial /m/ changes into alveolar /n/. Additionally, consonantal deletion takes place when labio-dental /v/ and glottal /h/ (in words like *gherāv* and *sipāhī*) are deleted in English. Furthermore, we observed the processes of changes in more than one consonant within a borrowed word, as seen in *juggernaut*. These processes occur when Hindi-Urdu loanwords are integrated into the English phonological system and can result in changes to their original pronunciation. Our analysis focuses on identifying the specific consonantal changes that occur in the loanwords, comparing their original pronunciation in Hindi-Urdu to their pronunciation in English, and discussing the implications of these changes for English phonology. Additionally, we look for any patterns or trends observed in the phonological adaptation of Hindi-Urdu loanwords in English.

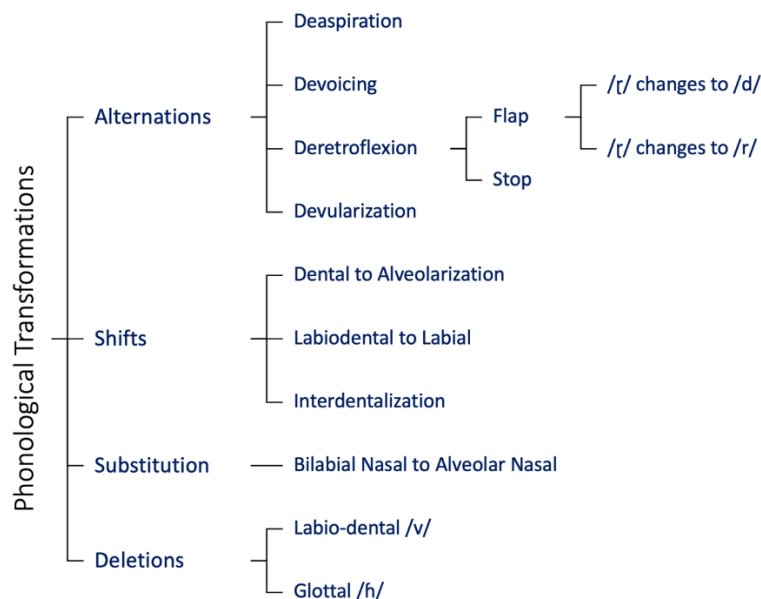


Figure 4. Phonological Transformations in Loanwords

RESULTS AND DISCUSSION

When Hindi-Urdu words are incorporated into English, several consonantal modifications often occur, as detailed in various phonological analyses. The following overview provides a comprehensive examination of these changes. In the data presented, ‘UK’ and ‘US’ denote British

English and American English, respectively. Further, the term, OELD refers to the Oxford English Learner’s Dictionary and CED to the Collins English Dictionary.

Deaspiration

Deaspiration is a phonological process where an aspirated sound loses its aspiration and becomes a non-aspirated sound. Deaspiration often occurs, especially for speakers of languages that do not have aspirated consonants or where aspiration is less distinctive. Let’s have a glance at the examples below:

Table 1. The Examples of Deaspiration

No	Hindi-Urdu Glossary	Phonemic Transcription	English Glossary	Phonemic Transcription	OELD Meaning
1	khāt) کھاٹ खाट	/k ^h a:t/	cot	/kɒt/ UK /kɑ:t/ US	a small bed with high sides for a baby or young child.
2	chhīnt) چھینٹ छींट	/tʃ ^h i:nt/	chintz	/tʃɪnts/ UK/US	a type of shiny cotton cloth with a printed design, especially of flowers, used for making curtains, covering furniture, etc.
3	ghī گھی घी	/g ^h i:/	ghee	[gi:] UK/US	a type of butter used in South Asian cooking

We note that when the Hindi-Urdu word /tʃ^hi:nt/ is borrowed into English, it undergoes deaspiration and is pronounced as /tʃɪnts/. The aspirated /tʃ^h/ sound of Hindi-Urdu is deaspirated to /tʃ/. Similarly, the word /k^ha:t/, undergoes deaspiration in English and is pronounced as /kɒt/ and /kɑ:t/, and in the case of the word /g^hi:/, the initial aspirated /g^h/ sound is deaspirated to /g/.

Devoicing

Devoicing is a phonological process that occurs when certain sounds lose their voicing (voiced sounds become voiceless sounds) when borrowed into another language. In the context of Hindi-Urdu words borrowed into English, we can observe devoicing in the following examples:

Table 2. The Examples of Devoicing

No	Hindi-Urdu Glossary	Phonemic Transcription	English Glossary	Phonemic Transcription	OELD Meaning
1	bahū بہو बहू	/bə.fu:/	bahu	/'ba:hu:/ UK/US	the wife of your son
2	hāt ہاٹ हाट	/ɦa:t/	haat	/ha:t/ UK/US	a market, especially one held regularly in a rural area
3	jihād جہاد जिहाद	/dʒɪ.ɦa:d/	jihad	/dʒɪ'ɦɑ:d/ UK/US	a spiritual struggle within yourself to stop yourself from breaking religious or moral laws, especially in Islam

Here, we notice that the voiced glottal fricative /ɦ/ is devoiced to /h/ when borrowed into English. There are several words found in English like that of this.

Deretroflexion

Deretroflexion is a specific phonological process where a retroflex consonant changes to a non-retroflex consonant, typically moving towards alveolar, palatal, or post-alveolar articulations. This means that the tongue moves forward in the mouth and the articulation becomes less retracted. This process might occur as part of a language change or in individual speech patterns. In some languages, this shift can result from sound changes over time or as a way to simplify articulation.

1. Deretroflexion of Flap

Hindi-Urdu retroflex flap sound /ɽ/ changes to an alveolar sound /d/ and post-alveolar approximant sound /r/ through the deretroflexion phonological process.

Table 3. The Examples of Deretroflexion of Flap

No	Hindi-Urdu Glossary	Phonemic Transcription	English Glossary	Phonemic Transcription	OELD Meaning
1	jugār جگاڑ जुगाड़	/dʒo.ga:ɽ/	jugaad	/dʒo'ga:d/ UK/ US	involving the use of skill and imagination to find an easy solution to a problem or to fix or make something using cheap, basic items
2	tārī تاڑی ताड़ी	/t̪a:ɽi:/	toddy	/'tɒdi/ UK /'tɑ:di/ US	a drink made with strong alcohol, sugar, hot water and sometimes spices
3	pagrī پگڑی पगड़ी	/pʌgɽi:/	pagri	/'pʌgri:/ UK	a turban or headscarf (CED)
4	sārī ساڑی साड़ी	/sa:ɽi/	sari	/sa:ri/ UK/US	a long piece of cloth that is wrapped around the body to make a long dress, worn by women in South Asia

We observe that in the word /dʒo.ga:ɽ/, the retroflex flap /ɽ/ is deretroflexed to /d/, resulting in the English pronunciation /dʒo'ga:d/ and similarly, in the word /t̪a:ɽi:/, the retroflex flap /ɽ/ is deretroflexed to /d/, leading to the English pronunciation /'tɒdi/ or /'tɑ:di/ whereas in the words /pʌgɽi:/ and /sa:ɽi/, the retroflex flap /ɽ/ is deretroflexed to /r/, resulting in the English pronunciation /'pʌgri:/ and /sa:ri/ respectively. The retroflex flap sound in the original word is realized as a postalveolar approximant in English.

2. Deretroflexion of Stop

Hindi-Urdu retroflex stop sound /ɖ/ and /ɽ/ change to alveolar sounds /d/ and /t/ in English pronunciation.

Table 4. The Examples of Deretroflexion of Stop

No	Hindi-Urdu Glossary	Phonemic Transcription	English Glossary	Phonemic Transcription	OELD Meaning
1	dingī ڈینگھی डींगी	/d̪iŋgi/	dinghy	/'dɪŋi/ UK /'dɪŋgi/ US	a small open boat that you sail or row
2	dosā डोसा डोसा	/d̪oːsaː/	dosa	/'dəʊsə/ UK/US	a southern Indian pancake made with rice flour
3	ghāt गھاٹ घाट	/gʰaːt̪/	ghat	/gɑːt/ UK/US	steps leading down to a river or lake

We see that in the word /d̪iŋgi/, the retroflex stop /d̪/ is deretroflexed to /d/, resulting in the English pronunciation /'dɪŋi/ or /'dɪŋgi/ and similarly, in the word /d̪oːsaː/, the retroflex stop /d̪/ is deretroflexed to /d/, leading to the English pronunciation /'dəʊsə/ whereas in the words /gʰaːt̪/, the retroflex stop /t̪/ is deretroflexed to /t/, resulting in the English pronunciation /gɑːt/.

Deuvularization

Deuvularization is a phonological process in which a uvular sound is replaced by a sound produced at a different place of articulation, typically a more anterior position such as the velar or palatal area. In simpler terms, it's the shift from sounds articulated with the back of the tongue against the uvula to sounds articulated further forward in the mouth.

Table 5. The Examples of Deuvularization

No	Hindi-Urdu Glossary	Phonemic Transcription	English Glossary	Phonemic Transcription	OELD Meaning
1	qīmā قیمہ क्रीमा	/qiːmaː/	keema	/'kiːmə/ UK/US	meat that has been cut into very small pieces; a spicy dish made using this ingredient
2	khākī خاکی खाकी	/xaːkiː/	khaki	/'kɑːki/ UK /'kɑːki/ US	a strong yellow-brown cloth, used especially for making military uniforms
3	niqāb (naqāb) نقاب नकाब	/niqaːb/ /naqaːb/	niqab	/nɪ'kɑːb/ UK/US	a piece of cloth that covers the face but not the eyes, worn in public by some Muslim women

We note that the initial uvular sound /q/ in the word /qiːmaː/ transitions to the velar sound /k/ in English, thereby facilitating pronunciation for English speakers. Similarly, the initial uvular sound /x/ in the word /xaːkiː/ is adapted in English to /'kɑːki/. Additionally, the uvular sound /q/ in /niqaːb/ is rendered as the velar /k/, resulting in the English pronunciation /nɪ'kɑːb/. Briefly speaking, the Uvular sounds /q/ and /x/ do not exist in English, therefore, they are replaced by a velar sound /k/ to facilitate the English pronunciation.

Interdentalisation

Interdentalization is a phonological process where a sound that is typically produced with the tongue in a different position (such as dental or alveolar) is articulated with the tongue placed between the teeth, making it an interdental sound. Non-interdental sounds like dental aspirate /tʰ/ and retroflex aspirate /ʈʰ/ are changed into interdental sound /θ/ when borrowed into English from Hindi-Urdu.

Table 6. The Examples of Interdentalisation

No	Hindi-Urdu Glossary	Phonemic Transcription	English Glossary	Phonemic Transcription	OELD Meaning
1	thānā تهانا थाना	/tʰa:.na:/	thana	/'θa:.na:/ UK/US	a police station
2	thag ٹھگ ठग	/tʰʌg/	thug	/θʌg/ UK/US	a violent person, especially a criminal

We observe that the initial dental aspirated sound /tʰ/ in the word /tʰa:.na:/ is adapted to the interdental sound /θ/ in the English word /'θa:.na:/ and similarly, the initial retroflex aspirated sound /ʈʰ/ in the word /tʰʌg/ is rendered as the interdental sound /θ/ in the English word /θʌg/.

Dental to Alveolarization

Dental to alveolarization is a phonological process where dental sounds (those produced with the tongue against the upper teeth) shift to alveolar sounds (produced with the tongue against the alveolar ridge, which is just behind the upper front teeth). Dental to alveolarization is a common occurrence in English borrowings from Hindi-Urdu, as shown in the examples below:

Table 7. The Examples of Dental to Alveolarization Alterations

No	Hindi-Urdu Glossary	Phonemic Transcription	English Glossary	Phonemic Transcription	OELD Meaning
1	dharm دھرم धर्म	/dʰərm/	dharma	/'dɑ:mə/ UK /'dɑ:rmə/ US	(in Hinduism) the law that affects the whole universe and on which all correct behaviour is based
2	dalit दलित दलित	/d̪ə.lɪt/	dalit	/'dʌlɪt/ UK / US	(in the traditional Indian caste system) a member of the caste that is considered the lowest and that has the fewest advantages
3	sharbat شربت शर्बत	/ʃʌrbʌt/	sherbet	/'ʃz:bət/ UK /'ʃz:rbət/ US	a sweet frozen food made from sugar, water and fruit juice, often eaten as a dessert

We observe that the dental /d^h/ sound in the word /d^hərm/ shifts to the alveolar sound /d/ in English, making it easier for English speakers to pronounce. Similarly, the word /d̪ə.lɪt/ changes in English to be pronounced as /'dʌlɪt/. Further, the final dental sound /t̪/ in /ʃʌrɪbʌt̪/ becomes the alveolar sound /t/, resulting in the English pronunciation /'ʃɜːbət/ or /'ʃɜːrɪbət.

Labiodental to Labial

Labiodental to labial is a phonological process where a sound that is normally articulated with the lower lip against the upper teeth (labiodental) shifts to a sound articulated with both lips together (labial). The labiodental /v/ sound in the Hindi-Urdu word becomes the labial sound /w/ in English word.

Table 8. The Examples of Labiodental to Labial Alterations

No	Hindi-Urdu Glossary	Phonemic Transcription	English Glossary	Phonemic Transcription	OELD Meaning
1	navāb نواب नवाब	/nʌvɑːb/	nawab	/nə'wɑːb/ UK /nə'wɑːb/ US	a Muslim with high social status or rank
2	svāmī سوامی स्वामी	/svɑːmiː/	swami	/'swɑːmi/ UK/US	a Hindu religious teacher
3	vālā والا वाला	/vɑːlɑː/	wallah	/'wɒlə/ UK/US	a person connected with a particular job or place

We find that the labiodental /v/ sound in the word /nʌvɑːb/ becomes labial sound /w/. Similarly, the word /svɑːmiː/, changes to English, resulting in pronunciation like /'swɑːmi/. Additionally, the initial labiodental sound /v/ in the word /vɑːlɑː/ gets altered to the labial sound /w/ in the word /'wɒlə/ in English.

Labiodental and Glottal being Deleted

The deletion of labiodental and glottal sounds in English can be attributed to several phonological processes and historical developments. This can involve the dropping, replacement, or both of certain sounds, including the labiodental /v/ and the glottal /ɦ/ in the following examples.

Table 9. The Examples of Labiodental and Glottal Deleted

No	Hindi-Urdu Glossary	Phonemic Transcription	English Glossary	Phonemic Transcription	OELD Meaning
1	gherāv گھیراؤ घेराव	/g ^h e.raːv/	gherao	/ge'rao/ UK/US	a protest in which workers prevent employers from leaving a place of work until they are given what they want
2	sipāhī سیپاہی सिपाही	/sɪpɑːɦɪː/	sepoy	/'si:pɔɪ/ UK/US	in the past, an Indian soldier serving under a British or European officer

3	mehndī مہندی मेहंदी	/mēh̄ḡḡiː/	mehndi	/'mendi/ UK/US	the art of applying a temporary design to a person's skin using a red-brown dye (= a substance used to change the colour of something), especially for their wedding day
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We view that the labiodental sound /v/ in the word /g^he:ra:v/ gets replaced by back high short vowel in English. Similarly, the word /sɪpa:fiː/ loses its glottal sound in English and is pronounced as /'si:pɔɪ/, and the vowel /aː/ is substituted by /ɔ/. In addition, the glottal sound /ɦ/ in the word /mēh̄ḡḡiː/ is deleted in the English word /'mendi/.

Discussion

The findings of this study reveal the complex phonological adaptations occurring when Hindi-Urdu words are integrated into English. Phonological processes such as deaspiration, devoicing, deretroflexion, and deuvularization observed in this research align with established cross-linguistic adaptation patterns, where the phonetic structure and phonological preferences of the receiving language guide modifications to achieve phonological coherence. These results echo prior studies on phonetic assimilation in lexical borrowing, highlighting how the receiving language tends to modify phonological features of borrowed words to accommodate its own linguistic structures and ease of articulation [5], [22], [23], [24], [25], [26]. Deaspiration, a prominent feature of the findings, can be seen in the adaptation of words like *khāṭ*, which becomes *cot* in English as aspirated sounds lose their aspiration when assimilated. This phenomenon is consistent with Ni Luh Putu Sri Adnyani's [27] observations on cross-linguistic phonetic adaptations, where aspirated sounds are often deaspirated in languages like English that do not phonemically differentiate based on aspiration. Similarly, Ander Egurtzegi [28] found that deaspiration is a common phonetic adaptation in English for borrowed words from languages with strong aspiration, as English phonotactics generally omit such distinctions.

In addition to deaspiration, devoicing also plays a significant role in the phonological transformation of Hindi-Urdu borrowings. In words like *bahū*, voiced sounds such as /ɦ/ are devoiced, reflecting English's tendency to eliminate voiced phonemes less common in its own phonetic system. Studies by Klára Přečková et al. [29] and Haydée Fiszbein Wertzner et al. [30] reinforce these findings, as devoicing is observed as a standard adaptation in receiving languages with distinct preferences for voiceless sounds. For example, Siame et al. found similar devoicing patterns when Japanese borrowed words with voiced sounds from other languages, aligning with phonological preferences. The process of deretroflexion observed in the transformation of Hindi-Urdu retroflex sounds further reflects phonological adaptation to English preferences. Words like *jugār* becoming *jugaad* illustrate English's tendency to adapt retroflex sounds such as /ɽ/ into more familiar alveolar sounds. Hannah L. Goh et al. [31] also note that deretroflexion is a common response to cross-linguistic adaptation, particularly when the receiving language, like English, lacks retroflex sounds. Regina Galuh et al. [32] observed a similar pattern in Korean words adapted in Japanese, where retroflex sounds are often replaced with alveolar or postalveolar sounds, aligning with the phonological norms of the recipient language.

The findings regarding deuvularization, as seen in words like *qīmā* becoming *keema*, illustrate a significant adaptation where uvular sounds absent in English are replaced by velar sounds, facilitating easier pronunciation for English speakers. This supports theories suggesting that when specific phonemes are absent in the recipient language, they tend to be replaced by the nearest available sounds in the phonetic space of that language [33], [34], [35]. Notably, these phonological adaptations are not without exceptions, as evidenced by misiterations in words like *bhai*, which is pronounced as *bai* in English, altering both aspiration and syllabic structure. Such deviations from standard adaptation patterns indicate that perceptual errors, sociolinguistic influences, or orthographic inconsistencies may interfere with systematic phonological adaptation. This study reveals that while there are general patterns of phonological change across languages, occasional misiterations illustrate the variability in perception and interpretation by speakers of the recipient language.

Overall, these findings underscore the nuanced phonological adaptation processes in Hindi-Urdu loanwords into English, reflecting the complex interplay between phonetic requirements and phonological perception in the recipient language. The novelty of this research lies in its detailed analysis of consonantal transformations, an area that remains underexplored in previous studies. While much prior research has focused on the sociocultural and historical aspects of lexical borrowing, this study advances the understanding of phonological adaptation, particularly through consonantal changes driven by structural differences between the two languages. Consequently, this research provides a significant contribution to the literature on loanword phonology and language contact, particularly in the context of Indo-Aryan and Indo-European language interaction.

CONCLUSION

This study provides a detailed analysis of the phonological adaptation of Hindi-Urdu loanwords into Standard English, focusing on consonantal transformations such as deaspiration, devoicing, deretroflexion, and deuvularization. These changes reflect English's phonological constraints and demonstrate the flexibility of Hindi-Urdu phonemes in adapting to a different linguistic system. The findings contribute to the understanding of phonological processes in cross-linguistic contexts, particularly between Indo-Aryan and Indo-European languages. This research highlights the importance of phonological adaptation in loanword integration, offering valuable insights into the complexities of language contact. Future studies could benefit from exploring regional variations in the adaptation of loanwords across different English dialects and incorporating cognitive and sociolinguistic perspectives to further enrich our understanding of phonological adaptation.

LIMITATIONS

This study is limited by its focus on a specific set of Hindi-Urdu loanwords in Standard English, potentially overlooking regional variations. Additionally, it primarily examines consonantal changes, leaving other phonetic aspects unaddressed. The sample is also confined to mainstream dictionaries, which may not represent all loanwords in colloquial English. Future research should consider a broader range of dialects and include other phonetic features for a more comprehensive analysis.

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AUTHOR CONTRIBUTION

B.K. was responsible for conceptualizing the study, designing the research methodology, and conducting the literature review. M.A. contributed to data analysis, result reporting, and writing the discussion and conclusion sections. M.Z. assisted in refining the manuscript and provided valuable insights during the final revision. All authors collaborated on the interpretation of the results and the final revision of the manuscript. All authors read and approved the final version of the manuscript for publication.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DECLARATION OF USE OF AI IN SCIENTIFIC WRITING

The authors used ChatGPT for improving the wording and sentence structure. The content was carefully reviewed and edited by the authors, who take full responsibility for the publication's content.

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