VOWEL ADJUSTMENT IN KHOWAR: A PHONOLOGICAL ANALYSIS OF ENGLISH LOANWORDS

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ABSTRACT

Every living language incorporates new words to enhance its vocabulary. Khowar language, due to language contact, has borrowed numerous words from English that have been firmly integrated into its vocabulary. This study examines the incorporation of English loanwords into Khowar with a focus on the adjustment of English vowels. For this purpose, the study employs a descriptive design and qualitative research method for data collection. The data is collected using the technique of self-observation. A total of 54 loanwords are collected and out of the 54 loanwords, a sample of 38 loanwords demonstrate vowels in different positions that are not included in the phonemic inventory of Khowar. The data is analyzed according to Levenshtein's (1966) Distance Algorithm Model to investigate the phonemic variations in English loanwords. This study also adopts LaCharite & Paradis' (2005) Phonological Repair Model which claims that when loanwords are incorporated into the target language, they undergo certain modifications. Based on the research findings, it is revealed that specific English vowels are absent in Khowar. Consequently, the recipient language modifies the English vowels by using phonemes already present in its phonemic inventory that are phonologically closest or replaces them entirely with different vowels. The findings show that the central vowels /ə/ and /ʌ/, the back vowel /ɒ/ as well as the closing diphthongs əʊ/, /eɪ/ and /aɪ/ are not present in the phonemic inventory of Khowar. Certain phonological processes, such as vowel substitution, vowel elision, and glide insertion, are applied to these English vowels to incorporate them into Khowar.

Keywords: English Loanwords, Khowar, Vowel Adjustment, Diphthongs, Phonological Processes

INTRODUCTION

English has been widely accepted as a global language for decades. Various terms like World Englishes, English as an international language, English as a global language, and English as a lingua franca have been used by scholars to highlight its exceptional influence (Crystal, 1997). The advancement of English has been greatly aided by modern technologies. Dollerup (1996), has viewed the development of television as a potent vehicle for promoting English among the general people. In a relatively short amount of time, the English language evolved into a worldwide donor language. In Pakistan English prevails as the primary language, overshadowing the national language Urdu, which holds second place, followed by regional languages in terms of popularity and usage. English has made a significant impact on Pakistani languages, with numerous English loanwords integrated into them through lexical borrowing.

Lexical borrowing is a process whereby the speaker of one language introduces lexical items to another language (Trudgill, 1992; Kachru, 2006). As these lexical items disseminate within the host community and become part of regular usage, they are very

quickly adapted. The adapted lexical items are named loanwords. Pavol (2005) defines loanwords as new lexical items that are modified to fit the phonotactics of the receiving language. These loanwords have the potential to become part of a language's standard lexicon. Hoffer (2002) suggests that it usually takes around twenty to twenty-five years of consistent usage before a word is officially included in a major dictionary. Therefore, the loanwords gradually undergo a process of nativization over time (Kemmer, 2013). One significant method of this nativization of loanwords involves phonological adaptation, wherein the words are altered to adhere to the preferred phonological structure of the recipient language. Interestingly, this pattern is typical when it comes to adapting words borrowed from English into Khowar. The English loanwords frequently undergo modifications to align with the phonological characteristics of Khowar.

These English loanwords are extensively used in Khowar nowadays. They contain some vowel sounds that are absent in the Khowar language. According to Kang et al. (2018), standard British English comprises 19 vowels, that include five long vowels, seven short vowels, and seven diphthongs. Conversely, Liljegren and Khan (2017) and Sloan (2006) highlight that Khowar only possesses five contrastive vowels. Therefore, it will be interesting to analyze how Khowar manages to adjust the English loanwords having vowels that are not parts of its phonemic inventory.

1.1 Background of the Study

The northern regions of Pakistan boast a rich linguistic diversity. The local inhabitants of these areas have exposure to a variety of languages, making them truly multilingual. In addition to their mother tongue, they can speak and understand other languages as well. One such linguistically diverse region in the north of Pakistan is Chitral, a picturesque valley located in the Khyber Pakhtunkhwa province. Khowar is the native language of the inhabitants of the Chitral district. The word Khowar is a blending of two different words "Kho" and "war" which means the language of the Kho or Chitrali people (Sloan, 1981). Besides being spoken in Chitral, Khowar is also used in the Ghizer and Yasin valleys of Gilgit Baltistan, Swat, Tajikistan, and Afghanistan. According to Rehman (2010), it is the second most spoken language in the district of Khyber Pakhtunkhwa and the third most spoken language in Gilgit Baltistan.

Khowar has been influenced by other languages throughout its history. In recent years English has significantly influenced the language. Khowar like other languages of the world has borrowed many words from English. These have been incorporated into the language permanently through a process known as loanword adaptation. This process transforms ill-formed words from the source language into well-formed words in the borrowing language (Peperkamp & Dupoux, 2003). Thus, when a foreign word enters a particular language it suddenly changes its sound structure to agree with the native sound system (Muriira, 2017). The English loanwords contain some vowel sounds that are lacking in Khowar, hence, this study investigates the adjustment of English vowel sounds according to the sound patterns of Khowar.

1.2 Statement of Problem

One major cause of language change is linguistic borrowing. It is a process in which words or lexical items are borrowed from one language into another. When such words enter a language, they do not agree with the phonological system of the recipient language. Thus, the recipient language applies certain strategies to nativize the foreign words. Since Khowar comprises five vowels, whereas English consists of twelve pure vowels and seven complex vowels (diphthongs), it follows that Khowar lacks certain vowels. As a result, when incorporating English loanwords, Khowar adjusts the vowels to better align with its own set of vowel sounds. This research study focuses on the adaptation of vowels present in English loanwords. Considering Khowar's limited set of vowels, it is crucial to investigate how English loanwords with pure and complex vowels undergo adjustments when integrated into Khowar.

1.3 Significance of Study

This study holds significance as it seeks to investigate the phonological variations, specifically focusing on the adaptation of vowels in English loanwords into the Khowar language. This current study is also significant because it marks the initial exploration of English vowels from the viewpoint of Khowar.

1.4 Delimitation

This research study focuses on the vowel adaptation patterns involved in the nativization of English loanwords. This research study is delimited to only vowel adaptation therefore, consonantal, and suprasegmental adaptations are outside the scope of the current study.

1.5 Research Questions
1. What are the specific English vowels that are absent in the phonemic inventory of Khowar language?
2. How does Khowar adjust vowels when integrating English loanwords, and what specific patterns emerge in this process?

1.6 Research Objectives
1. To identify the English vowels that are lacking in Khowar.
2. To examine the process of vowel adaptation in the Khowar when incorporating English loanwords.

2. Literature Review

Language change happens when two or more different languages come in contact with each other. "Regardless of the degree or nature of contact between neighboring people, it typically results in some form of mutual linguistic influence" (Sapir, 1921, p. 205). According to Yalwa (1992), without having contact with other groups nearby, no human group or society can survive. Thomason (2001) asserts that when there are contact situations, linguistic changes are more probable, and these changes are less likely to occur without such interactions. As a result of language contact, there is a subsequent emergence of lexical borrowing.

2.1 Lexical Borrowing

Lexical borrowing is defined by Trudgill (1992), as the process whereby the speaker of one language introduces words to another language. The words that are borrowed are called "loanwords". Loanwords contrast with native words, which can be traced back to the earliest known stages of a language (Lehmann, 1962). According to Katamba (2005), a lot of factors can lead to borrowing, such as when a new notion is introduced in a language, borrowing occurs to fill the linguistic gap. For the new ideas, we need new terminology, thus we borrow words. The concept of prestige is another main factor for lexical borrowing. Muriira (2017) claims that when a foreign word enters a particular language it suddenly changes its sound structure to agree with the native sound system. This process of sound changes to the structure of a loanword is called phonological adaptation.

2.2 Phonological Adaptation of Loanwords

Many languages across the world take words from each other. The words that one language borrows from another language are called loanwords and the process overall is called lexical borrowing. When such words enter a language, they either get adopted i.e., remain the same and no changes happen, or they get adapted, that is there will be certain changes to its phonological structure. Loanword adaptation is a process whereby borrowed words undergo certain phonological changes. According to Kager (1999), the loanword should be exposed to a repair option to meet the phonotactics of the recipient language (L1). When a word enters a language through borrowing it either accepts the grammatical rule of the recipient language or violates it (Guba, 2016). Thus, phonological adaptation refers to the restructuring phonology of loanwords based on the phonotactics of the recipient language. In this study the donor language is English, and the recipient language is Khowar.

2.3 Khowar Language

Khowar is the native language of the inhabitants of the Chitral district ("Ethnologue", 2022). The speakers of Khowar and the language itself are normally called Chitrali. The word Khowar is a blending of two different words "Kho" and "war" which means the language of the Kho or Chitrali people (Sloan, 1981). Khowar is an ancient language and has been influenced by other languages throughout its history. Morgenstierne (1947) claims while Khowar has experienced influences from various languages such as Persian and Pashto, its fundamental structure remains purely Indo-Aryan. Throughout history, the region's boundaries were surrounded by languages like Persian, Pashto, and Shina, which had an impact on the lexicon of Khowar.

However, in more recent times, Urdu and particularly English have significantly influenced the Khowar language.

2.4 Phonemic Inventory of Khowar

The phoneme inventory of any language deals with the speech sounds of that language and these sounds are distinct from each other. Liljegren and Khan (2017) conducted a detailed study on the phonemic inventory of the Khowar language and accordingly, Khowar has a total of seven manners of articulation, and out of these seven, five play a contrastive role within the manner of articulation subsets. There are 41 consonant sounds in total in the Khowar language. Sloan (2006) and Bashir (2001) have distributed the oral and nasal stops as; /p/, /pʰ/, /b/, t̪/, /t̪ʰ/, /d̪ /, /ʈ/, /ʈʰ/, /ɖ/, /k/, /kʰ/, /g/, /q/ as oral stops while /m/, /n/ as

nasal stop. Like most of the fricatives in other languages, the fricatives of Khowar are continuant. It means that they can be produced without any are given in table 1:

interruption like in the case of plosives. Khowar fricatives are /f/, /s/, /z/, /ʃ/, /ʒ/, /ʂ/, /ʐ/, /x/, /ɣ/, /h/ (Sloan, 2006). The consonants of Khowar

Table:1

Consonant Inventory of Khowar

	Bilabial	Dental/alveolar	Postalveolar (apical)	Postalveolar (laminal)	Velar	Uvular	Glottal
Plosive	p b pʰ	t d tʰ	t d tʰ		k g kʰ	q	
Nasal	m	n			ŋ		
Affricate		t͡s d͡z t͡sʰ	t͡ʂ d͡ʐ t͡ʂ..ʰ	t͡ɕ d͡ʑ t͡ɕʰ			
Fricative	f	s z	ʂ ʐ	ɕ ʑ	x ɣ		h
Tap		ɾ					
Approximant	ʋ			j			
Lateral Approximant		ɬ		l			

Note. Taken from Liljegren and Khan (2017)

2.5 Vowels of Khowar

Like all language systems of the world, Khowar also has vowels in its inventory. According to Sloan (2006), there are only five vowels in Khowar. These vowels serve as the nucleus or central portion of syllabification. Vowels in Khowar just like that of English are all voiced. There is a difference of vowels in Khowar with regards to tongue advancement like there are front and back as well as open and close vowels. Every vowel in Khowar becomes somewhat nasalized due to adjacent nasal consonants. For example, in pon (road), /pɔn/ the nasal consonant /n/ makes the vowel sound /ɔ/ nasalized. Thus, we can generalize that any vowel in Khowar becomes nasalized whenever it precedes a nasal consonant.

We can distribute vowels of Khowar in three main features based on the shape and position of the tongue and lips functioning. For example, vowels are produced using the tongue's front part and back part. They are also produced with the tongue having a maximum or minimum vertical distance to the palate or roof hence Khowar vowels are distributed into open and close vowels. Another important quality of producing vowels is lip rounding. Among these five vowels in Khowar /ɪ/ and /ɛ/ are front whereas the rest of the three /u ɔ ɑ/ are back vowels. Similarly, /ɛ ɑ ɔ/ are open category of vowels in Khowar while /ɪ u/ are closed vowels. Likewise, /i ɛ ɑ/ are unrounded whereas /u, ɔ/ are rounded vowels. Usage of these vowels is given in the table below:

Table 2
Usage of Vowels in Khowar

Vowels	Usage in Khowar	Gloss
ɪ	bɪk	To go
ɛ	d̪ɛk	To run
ɑ	mɑs	moon
ʊ	ʃʊt	soar
ɔ	ɫɔ	fox

Apart from these short vowels, there are also long vowels in Khowar. "These vowels tend to be longer than short vowels in similar contexts and they are different from short vowels not in length but also in quality" (Roach, 2009, p.19). The long vowels that are used in Khowar are displayed in the following table:

Table 3
Long Vowels in Khowar

Long Vowels	Usage in Khowar	Gloss
i:	hi:m	snow
e:	kɑfe:ɾ	Infidel
a:	ma:ɫ	nest
ɔ:	gɔ:ɾ	sorceress
u:	u:x	water

Moreover, stress on these vowels act contrastively e.g., bɛ́lu (basket) and bɛɫú (flute). Mostly in Khowar stress falls on the last syllable, but it can also fall on the second to the last syllable (Liljegren & Khan, 2017). They found out that when vowels are stressed in Khowar they become longer in duration. Tone in interaction with stress is contrastive in Khowar e.g., dɔn 'tooth', dɔ̀n 'ghee' (Bashir, 2007).

2.6 English as Donor Language
For many decades, the English language has enjoyed widespread acceptance as a world language (Crystal, 1997). In the contemporary world, English holds significant prominence as one of the most crucial donor languages. Kachru has done a lot of research on Indian English. According to him, the reason why languages borrow lexical items from other lexicons is to fill up the lexical gaps. He describes in detail the contribution that English makes to the languages of South Asia (its recipients), emphasizing that it not only fills lexical gaps but also adds a surplus lexical item if a native item is already accessible (Kachru, 2006). There are several reasons why English has spread over the world. A culture's or nation's prestige is correlated with its strength and domination, and as a result, the language or languages of that culture advance in status. In a relatively short amount of time, the English language evolved into a worldwide donor language (Rudolf, 1996). English has given many words to other languages and Khowar is one of those. It has borrowed many words from English and adjusted them according to its phonotactics.

2.7 Related Studies
Kenstowicz and Suchato (2006) examined English loanwords and their adaptation in Thai. For their study, they collected 800 English loanwords that had entered Thai. The data has been collected by using the English-Thai dictionary. Their discussion revolves around the modifications made to the loanwords to align with the Thai CVC syllable template and variables influencing the assignment of a particular tone to the loanword. The study's conclusions indicate that vowel lengthening in loanwords was repaired in a unique manner, different from the native grammar's glottalization. Additionally, the adaptation of the interdentals as dental sounds, rather than the more acoustically similar labio-dental sounds, appeared to be based on articulatory reasons.

Iqbal and Ullah (2023) studied the phonemic variations in English loanwords borrowed into Afghani Pashto. A set of 90 English borrowed words was gathered from ten audio-video programs aired on Afghani TV channels, specifically news segments and discussion panels. The conversations of native Pashto speakers from Afghanistan were monitored to compile this set of words. The collected data underwent analysis using Levenshtein's (1966) Distance Algorithm Model, aimed at examining the phonemic differences present in these English loanwords. The research findings indicated that the majority of the borrowed words undergo phonemic variation, while some are simply adopted. The variations primarily involve shifts in vowel sounds, although there are instances where consonant sounds also change. These variations manifest through various phonological patterns, including addition, deletion, substitution, and epenthesis. Among these phonological strategies, substitution appears to be more prevalent compared to others.

In a study addressing monophthongization among native speakers, Watt (2003) delves into the internal and external factors influencing language sound changes. Watt (2003) investigates the evolution of new linguistic forms and the decline in the usage of

local forms. Specifically analyzing the diphthongs /əʊ/ and /ei/ found in words like "goat" and "gate," a majority of speakers between the ages of 16 and 25 tend to localize these diphthongs by pronouncing them as monophthongs in their English speech. The original diphthongs are replaced by the sounds /o:/ and /e:/. This inclination is particularly evident in female speech patterns.

In the investigation of learning English as a second language, Mousa (2015) focused on acquiring closing diphthongs /əʊ/ and /ei/. The study involved Arab participants and Jamaican informants, hypothesized to substitute diphthongs with monophthongs in their English usage. Mousa (2015) observed that 'They choose to use /e:/ and /o:/ rather than /əʊ/ and /ei/' (p.5). The reason for this monophthongization of diphthongs by Arabs and Jamaicans is the absence of centralized vowels in their vocalic system.

During the examination of the indigenization of English by native speakers of Shona (Zimbabwean), Kadengi (2009) investigated the phenomenon of monophthongization, (a process of simplifying diphthongs). Kadengi (2009) suggests that this process is adopted by native Shona speakers who unconsciously incorporate Afrikaans elements into their English. Additionally, Kadengi (2009) points out that Shona typically employs only five vowels (monophthongs). Consequently, the preference for monophthongs over diphthongs in Shona-infused English is attributed to the absence of intricate vowel sounds such as diphthongs and triphthongs in the Shona language.

Alhoody (2009) conducted a research study on the phonological adaptation of English loanwords in Qassimi Arabic. The English vowels /ɪ/, /eɪ/, /e/, /æ/, /ə/, /ʊ/, /əʊ/, /ɑ/, /ɒ/, /ʌ/, /ɜ:/, are marked in QA and are aligned with the QA vowels [i], [e:], [i], [a], [a], [u], [o:], [a], [u], [a], and [e:], respectively. Notably, diphthongs do not appear as surface structures in QA. Consequently, English loanwords containing diphthongs undergo adaptation in QA through the glide-formation strategy. Essentially, the initial vowel of the English diphthongs, such as /a/, remains intact, while the succeeding /ɪ/ and /ʊ/ are substituted in QA by their respective coronal and labial glides, denoted as [j] and [w].

Previous studies have highlighted the adjustment of loanwords in various languages worldwide, extensively addressing strategies for their adaptation. However, in the case of Khowar, there has not been any dedicated research on how Khowar incorporates pure and complex vowels from loanwords that are not originally part of its phonemic inventory. This has led to the identification of a gap in the existing literature. Therefore, this study holds significant importance in recognizing how the pure and complex vowels present in English loanwords that are not part of the Khowar inventory are adjusted. This study stands out as pioneering because, to date, there has not been an investigation into English vowel adjustment from the perspective of Khowar.

3. Research Methodology
3.1 Research Design
According to Kothari, research design is defined as "a conceptual framework that encompasses the plan for data collection, measurement, and data analysis" (Kothari, 2004, p. 31). The present study employs the qualitative approach that uses a descriptive research design to investigate how vowels found in English loanwords are phonologically adjusted in Khowar. The rationale for choosing a qualitative approach is that it is more effective in providing deep insight into dealing with the data collection and data analysis and helps to develop a thorough understanding of the phenomenon. Qualitative research has facilitated the examination of vowels and their adjustment into Khowar.

3.2 Data Collection
As a native speaker of Khowar, the researcher utilized a self-observation technique to gather loanwords over a period of three months (from September 2023 to November 2023). This was done by listening to the conversations within the Khowar speaking community. The data was collected by recording the conversation of Khowar speakers. The researcher used a mobile audio recorder as a research instrument for the collection of data. The random conversations were recorded and played later on. This helped the researcher to collect the English loanwords that contained pure as well as complex vowels (diphthongs). For clarity, the researcher sampled 5 native Khowar speakers and they were asked to pronounce the Loanwords. The English loanwords were then transcribed and analyzed.

3.3 Sample
In total, the study recognized 72 English words that were used regularly by Khowar speakers. Out of the total 54 were confirmed as loanwords. When collecting data through self-observation, determining whether a particular word is a loanword was a

complex process that required careful consideration. Because, in some cases, these loanwords often become integrated into the lexicon of the recipient language to the extent that they are used as commonly as words that are native to the language. However, the approach used to determine if a word is a loanword was to look it up in a dictionary. The researcher used two Khowar dictionaries to see if the words collected may be labeled as loanwords or not. For this purpose,

"Khowar English Dictionary: A Dictionary of the Predominant Language of Chitral, also known as Chitrali Zaban and as Qashqari" and "A Khowar-English Lexicon" were utilized. The former was written by Muhammad Ismail Sloan and published in 1981. The second edition of this dictionary which was published in 2006 is used in this study. The latter on the other hand is written by Dr. Elena Bashir and published in 2023. Those English loanwords were considered for analysis that have already become part of the Khowar dictionary. Out of the total 54 loanwords, 38 loanwords were observed to possess vowels in different positions that are not included in the phonemic inventory of Khowar. Thus, a sample of 38 English loanwords was collected and analyzed.

3.4 Theoretical Framework
This research employs LaCharite and Paradis' (2005) Model of Phonological Repair or Phonological Stance to substitute English phonemes with Khowar equivalents. The phonological repair or phonological stance model asserts that bilinguals borrow loanwords from their source language. These loanwords have a structure that does not conform to the phonological constraints of the recipient language. Therefore, they are modified in order to fit in the vocabulary of the borrowing language. For example, not all phonemes are preserved when incorporating loanwords into the recipient languages. Instead, the recipient languages insert, substitute, or delete phonemes to align them with its own phonotactic structures. This replacement of phonemes facilitates the smooth articulation of loanwords (Paradis & LaCharite, 2005)

The Levenshtein Distance Algorithm (1966) is applied to see the adjustment of English vowels in Khowar. This algorithm distinguishes the discrepancy between two words by measuring the minimum to the maximum number of alterations in sounds. This theoretical framework provides a comprehensive understanding of either phonemic alterations or similarities. It helps to understand how

similar or different words sound when different people pronounce them. The distance value between the two words is the minimum number of a single phoneme (addition, substitution, or deletion) that is required to change one word to another. The "distance value" here refers to the extent of change in the sounds of English loanwords when they are adjusted in Khowar. Chohan, Habib, and Hasan (2020) suggest that as the distance value increases, there tends to be a greater number of phonemic changes or differences. In this approach, words are transcribed using the International Phonetic Alphabet (IPA) and then compared to identify differences between them. Therefore, it is an ideal framework for examining variations during the adjustment of English loanwords having pure and complex vowels that are lacking in Khowar.

4. Data Analysis
In the analysis of data, the researcher applied qualitative method to examine the phonological variation in the structure of English loanwords. Certain techniques have been utilized in the nativization of an English loanword having pure and complex vowels. Phonemic transcription was employed to elucidate the phonological structure of English words, illustrating both their original phonology and their realization once integrated into Khowar. The online version of the Cambridge Dictionary https://dictionary.cambridge.org/ served as a primary resource for obtaining the phonemic transcriptions of the source words. Kang et al. (2018) state that standard British English consists of a total of 19 vowels, encompassing five long vowels, seven short vowels, and seven diphthongs. Roach (2009) on the other hand outlines the English phonemic inventory consists of eight diphthongs with the addition of /eə/. Notably, Khowar does not encompass any of these diphthongs and is also deficient in certain English pure vowels, as highlighted by Liljegren and Khan (2017) and Sloan (2006) that Khowar is limited to only five distinct vowels. The subsequent sections elaborate on how these additional vowel sounds in English loanwords are adjusted in Khowar and the adaptation techniques are discussed.

4.1 Adaptation of Pure Vowels
English monophthongs that lack a direct equivalent in Khowar are typically mapped with their closest phonological counterparts within the native Khowar inventory. This section provides information on the

adjustment of pure vowels and outlines specific adaptation techniques that English vowels go through when integrating into Khowar.

Adaptation of /ɒ/

English contains two back vowels that are ɒ/ and /ʊ/. The difference between these two vowels is that /ɒ/ is an open-back vowel whereas /ʊ/ is a closed-back vowel (Kang et al., 2018). While /ʊ/ is present in the phonemic inventory of Khowar, the /ɒ/ is lacking. Therefore, this vowel sound is adjusted using the technique of substitution. The back vowel /ɒ/ is replaced by the closest resembling sound in Khowar. The table below elucidates how it is adjusted.

Table 4

Adaptation of /ɒ/

S.no	IPA Transcription	Khowar	Gloss	Phonemic Transcription
a.	bɒm	bɑ:m	Bomb	/ɒ/→ [ɑ:]
b.	/ʃɒt/	ʃɑ:t	Shot	/ɒ/→ [ɑ:]
c.	/lɒk/	lɑ:k	Lock	/ɒ/→ [ɑ:]
d.	/læptɒp	leptɑ:p	Laptop	/æ/→ [e] /ɒ/→ [ɑ:]
e.	/bɒd.i/	bɑ.di	Body	/ɒ/→ [ɑ],
f.	/pɒl.ɪʃ/	pɑ.lɪʃ	Polish	/ɒ/→ [ɑ]
g.	/lɒk.ɪt/	lɑ.ket	Locket	/ɒ/→ [ɑ] /ɪ/→ [e]
h.	tɒfi	tɑ. fɪ	Toffee	/ɒ/→ [ɑ]
i.	kɒpi	kɑ. pɪ	Copy	/ɒ/→ [ɑ]
j.	hɒki/	hɑ. kɪ	Hockey	/ɒ/→ [ɑ]

If a sound is missing in the recipient language, it is adjusted to the nearest existing sound. The data above shows that Khowar lacks the low back rounded /ɒ/ vowel therefore it is adjusted with the already available open back unrounded vowel [ɑ (:)] The loanwords in (1) are mono as well as disyllabic.

(1)   a. bɒm   → [ɑ:]

          b. ʃɒt   → [ɑ:]

          c. lɒk   → [ɑ:]

          d. læptɒp   → [ɑ:]

The above loanwords are monosyllabic except /læptɒp/, which is disyllabic. From (a) to (d), the loanwords contain the back /ɒ/ vowel at the words' medial position as the head of the syllable. The open-back rounded vowel /ɒ/ is substituted by the long unrounded vowel /ɑ:/ in these cases. With respect to the adaptation of /ɒ/ as /ɑ:/, the results indicate that when the loanword takes the rounded vowel /ɒ/ in a closed syllable, it is replaced with the long vowel /ɑ:/. However, when it is an open syllable the vowel is adjusted using the short open back vowel /ɑ/. For instance:

(2)   tɒ.fi   → [ɑ]

              kɒ.pi   → [ɑ]

              hɒ.ki   → [ɑ]

These loanwords are all disyllabic where the first syllable in each takes /ɒ/ vowel. The syllables end without any coda consonant making them open-type syllables (CV). The data shows that when the loanwords end with the vowel /ɒ/ without taking any coda (open syllable), the open back vowel /ɒ/ is replaced by /ɑ/ during adjustment in Khowar. There is another way of adjusting the /ɒ/ vowel sound. For example:

(3)   bɒd.i   → [ɑ]

          pɒl.ɪʃ   → [ɑ]

          lɒk.ɪt   → [ɑ]

When there are disyllabic loanwords and the second syllable is onset less, Khowar tries to adjust the loanword by taking the coda consonant of the first syllable and putting it at the onset position of the second syllable. This causes the first syllable to remain open without any coda consonant. This adaptation is driven by the fact that disyllabic native

Khowar words, most of the time take consonant at the onset position of the second syllable. There may be any disyllabic native Khowar word where the second syllable lacks onset. The above loanwords are also adjusted in a similar fashion. Initially, the loanwords undergo re-syllabification, leading to the commencement of the second syllable with an onset consonant. The substitution of the rounded vowel /ɒ/ with /ɑ/ is primarily driven by the open syllable structure that emerges in the loanwords after this adjustment. The phonemes /ɑ:/ and /ɑ/ are concluded as the most suitable replacement for fixing words that contain /ɒ/.

The orthography does not play any role in the adjustment of this English vowel. Therefore, the adaptation is not conditioned by the orthography of the source language rather it is purely based on a phonological basis. For instance, the sound /ɒ/ in the source forms is represented in writing by the graphemes /o/, therefore it is anticipated that the loanwords should be adapted by using the /ɔ/ sound. This existence of the grapheme <o> in the source form should have affected the rounded vowel /ɒ/ to be adapted as [ɔ] instead of the typical mapping [ɑ]. Thus, the role of orthography is not conditioned to this vowel. The adjustment of this central vowel is purely phonological as is claimed in the phonological stance model that if a certain phoneme in the source language is not available in the borrowing language, the adapter will determine the best match from a phonological perspective; that is a combination of phonological features.

Furthermore, the Levenshtein distance algorithm will further elaborate the obvious alterations in the adaptation of these loanwords.

Table 5

LD between the Loanwords

	a.	b.	c.	d.	e.	f.	g.	h.	i.	J
	/b ɒ m / fı	/ʃ ɒ t/	/l ɒ k /	/b ɒ d.i/	/p ɒ lıʃ/	/t ɒ/k ɒ pi/		/h ɒ ki/	/l ɒ k ı t /	/l æ p t ɒ p/
	↓	↓	↓	↓	↓	↓ ↓		↓	↓ ↓	↓ ↓
	b ɑ: m fı	ʃ ɑ: t	l ɑ: k	b ɑ d i	p ɑ.lıʃ	t ɑ k ɑ pı		h ɑ kı	l ɑ k e t	l e p t ɑ: p
LD Value	1	1	1	1	1	1	1	1	2	2

The distance algorithm shows that all the loanwords are deviating from the source form after their adjustment. The distance value ranges from 1 to 2 which means that 1 or 2 changes occur to the source word after adaptation. From 5(a) to 5(h) there is substitution of only one phoneme therefore LD value is 1. In the last two loanwords, two different phonemes are substituted therefore the LD value is 2. It is concluded that the English loanwords undergo phonological changes when they are adapted into Khowar. Furthermore, the technique of substitution has been applied for the adjustment of open back vowel /ɒ/**.** It is noted that the rounded vowel /ɒ/ when appears in a closed syllable is adjusted with the long vowel [ɑ:] in Khowar. However, when it occurs in an open syllable it is adjusted with the short vowel /ɑ/.

Adaptation of /ə/

The central vowel /ə/ is also called schwa (Kang et al., 2018). It is quite a common sound in English, being heard in the initial syllables of words like 'about,' 'oppose,' and 'perhaps,' for instance (Roach, 2009). In the context of Khowar, the utilization of /ə/ is infrequent, and the analysis of the data given in table no (6) further explains the adjustment of this English vowel in Khowar.

Table 6

Adaptation of / ə /

S.no	IPA Transcription	Khowar	Gloss	Phonemic Variations
a.	/nɔːr.məl/	nɑr.mel	Normal	/ɔː/→ [ɑ], /ə/→ [e]
b.	/lek.tʃər/	lek.tʃeːr	Lecture	/ə/→ [eː]
c.	/mɑːstər/	meʃ.teːr	Master	/ɑː/→ [e], /s/→ [ʃ], /ə/→ [eː]
d.	/əkædəmi/	ekedemi	Academy	/ə/→ [e] /æ/→ [e] /ə/→ [e]
e.	/əˈlɑːrm/	ɑlɑ.rɑːm	Alarm	/ə/ → [ɑ] /ɑː/ → [ɑ] Ø → [ɑː]
f.	/æl.bəm/	el.bɑːm	Album	/æ/ → [e]/ə/ → [ɑː]
g.	/kæmrə /	kemrɑ	Camera	/æ/ → [e],/ə/ → [ɑ]
h.	/pet.rəl/	pɪt.rɔl	Petrol	/e/ → [ɪ]/ ə/ → [ɔ]
i.	pen.səl	pen sɪl	Pencil	/ə/ → [ɪ]
j.	ɪnsəlɪn	ɪn.sʊ.liːn	Insulin `	/ə/ → [ʊ] /ɪ/ → [iː]/

The most commonly used central vowel is the schwa /ə/ (McMahon, 2002). During the adaptation process, a notable variation is anticipated, particularly in the adjustment of the frequently employed vowel sound. This occurs because the Khowar language lacks the /ə/ vowel and is realized as /e/,/eː/, /ɑ/, and /ɑː/ most of the time as these vowels are phonologically closest to the mid-central vowel /ə/. As already explored the English monophthongs found in the Khowar phonemic inventory are matched directly to their corresponding Khowar equivalents. However, the adaptation process for the English schwa appears to be influenced not only by phonological approximation but also exhibits orthographic effects. Given that English [ə] is phonologically closer to the Khowar open-back unrounded vowel /ɑ/ and the close-mid front vowel /e/. It would be expected to be mapped as /ɑ/ or /e/ if the mapping was based on phonological grounds. However, in the data, instances of the schwa are linked to various Khowar vowels such as /ɑ/, /ɑː/, /e/, /eː/, /ɔ/, /ɪ/ and /ʊ/. This suggests that apart from the phonological approximation the adaptation patterns are also likely to be conditioned by the orthography of the source language.

As mentioned above the closest Khowar phonemes to English schwa are the vowels /ɑ[ː]/ and /e[ː]/. Therefore, it is expected that in the adaptation process, a majority of instances will favor the utilization of these vowels. The findings confirm that this indeed holds true. For example:

(4)   /əˈlɑːrm/ → [ɑ]   /nɔːr.məl → [e] /əkædəmi/ → [e]

/æl.bəm/ → [ɑː]   /lek.tʃər/ → [eː]

/kæmrə/ → [ɑ]   /mɑːstər/ → [eː]

In the loanwords, /əˈlɑːrm/, /æl.bəm/ and /kæmrə/ the front short vowel /ɑ/ and /ɑː/ have replaced the schwa while in /nɔːr.məl/, /lek.tʃər/, /mɑːstər/ and /əkædəmi/, the close-mid front vowel /e/ and its allophonic longer version /eː/ have substituted the schwa vowel. These loanwords in table no (6) are all disyllabic and trisyllabic words, and they all have the central vowel in different positions. For example, in loanwords like, /nɔːr.məl/, /lek.tʃər/, /mɑːstər/, /æl.bəm/, /pet.rəl/,/pen.səl/, the central vowel occurs in word medial position of the second syllable and acting as head. The 6(d), /əkædəmi/ contains a quadrisyllabic loanword where the mid-central schwa sound acquires the onset position of the first syllable and also occurs in the third syllable making the syllables on their own (V type syllables). Similarly, the word in 6(e) /əˈlɑːrm/ takes the mid-central vowel at the onset position while /kæmrə/ and /ɪnsəlɪn/ contain the schwa at the coda position. Khowar lacks the central vowel /ə/, and thus substitutes the vowel with the nearest possible sounds in the native phonemic inventory. The results show that the closest Khowar phonemes to the English vowel are the open-back unrounded vowel /ɑ/ and the close-mid front vowel /e/. Thus, based on the phonological approximation the mid-central vowel /ə/ has been adjusted with the nearest possible vowels of Khowar.

However, it seems that apart from phonological approximation orthographic effects as well have an impact on the adaption process of the English schwa. The source words' graphemes play a role in accommodating the sound /ə/. Put differently, the written representation of the /ə/ sound in the source words includes graphemes such as (o, u, i, e, a...). If the schwa sound is not mapped to back /ɑ[:]/ or front /e[:]/ these different graphemes determine how the schwa sound /ə/ is adapted in Khowar. For instance the loanwords /pet.rəl/, /pen.səl/ and / ɪnsəlɪn/ have been adapted in Khowar with the substitution of /ə/ with /ɔ/ in (pɪt.rɔl), /ɪ/ (pen sɪl) and with /ʊ/ in (ɪn.sʊ.liːn) respectively. The presence of the graphemes 'o', 'i', and 'u' in the source word influenced the adaptation of the schwa to become /ɔ/, /ɪ/, /iː/ and /ʊ/ instead of the typical mapping /ɑ/ or /e/. It is concluded that phonemic approximation plays a vital role in the adaptation of schwa and to some extent orthography plays its part.

Phonemic variations through different patterns are discussed in the following detailed analysis. The Levenshtein (2014) Distance Algorithm further explains the adjustment of this vowel in Khowar.

Table 7

LD between the loanwords

	a.	b.	c.	d.	e.	f.	g.	h.	i.
	/n ɔː r m ə l/	/lektʃ ə r/	/m ɑː s t ə r/	/ə k æ d ə mɪ/	/ə l ɑː r m/	/æ lb ə m/	/k æ m r ə/	/p e t.r ə l/	/pen.s ə l/
	/n ɑ r m e l/	/lektʃ eː r/	/m e ʃ t eː r/	/e k e d e mɪ/	/ɑ l ɑ. r ɑː m/	/e lb ɑː m/	/k e m r ɑ/	/p ɪ t.r ɔ l/	/pen s ɪ l/
	↓ ↓	↓	↓ ↓ ↓	↓ ↓ ↓	↓ ↓ ↑	↓ ↓	↓ ↓	↓ ↓	↓
LD Value	2	1	3	3	3	2	2	2	1

The table above shows the distance value of the loanwords after their adjustment in Khowar. The distance value between the two words represents the minimum number of alterations in a single phoneme due to substitution or insertion. In this study, the distance value refers to the phonemic changes or variations that occur in English loanwords when they are adapted into Khowar. The table (7) shows the loanwords in their original form and the number of variations after their adjustment. In the English loanwords, 7 (a), (b), (c), and (d) the central vowel is replaced with the closed-mid front vowel /e/ and its

allophonic version /e:/. The LD value of /nɔːrməl / is 2, because the rounded vowel /ɔ:/ is substituted by the unrounded back vowel /ɑ/. Similarly, the distance value for /lektʃər/ is one, since there is a substitution of only one sound segment. The /ə/ changes into /e:/. It is noted that if the source word ends with the approximant /r/ and /ə/ is used before it the /ə/ changes into /e:/. The next loanword /mɑːstər/ has a distance value of three. The open-back long vowel /ɑ:/ is replaced by the short vowel /e/. Then the voiceless fricative consonant /s/ is replaced by the voiceless affricate /ʃ/. And finally, the vowel /ə/ that is of particular focus is substituted with the long vowel /e:/. The loanword in 7(d) /əkædəmɪ/ contains schwa at the onset position of the first syllable and in between the consonants in the last syllable. Both the time /ə/ is replaced with the close mid-front unrounded vowel /e/. Its distance value is three because the front vowel /æ/ has also been substituted by another front vowel /e/. In the loanwords /əlɑːrm/, /ælbəm/, and /kæmrə/ the open back unrounded vowel /ɑ/ and its allophonic longer version /ɑ:/ are utilized. The loanword /əlɑːrm/ which begins with the initial schwa sound is substituted with /ɑ/. The distance value for this loanword is three because the open back vowel /ɑ:/ is substituted with /ɑ/. Khowar does not allow the complex consonant cluster thus the /ɑ:/ vowel is inserted to break the consonant cluster at the coda position. This vowel has no counterpart in the source word. The LD values of /ælbəm/ and /kæmrə are two since the front vowel /æ/ and the mid-central vowel /ə/ are replaced with /e/ and /ɑ[:]/ respectively. It is noticed that when the schwa is used inside a closed syllable it is adjusted with a long vowel /ɑ:/. On the contrary, when the syllable is open it is adjusted with a short vowel /ɑ/. The LD values of the last three loanwords are two, one, and two. The loanword /pet.rəl/ is adjusted with

the substitution of two different phonemes. The mid-front unrounded vowel /e/ is replaced by the front /ɪ/ vowel and the schwa /ə/ is replaced by the rounded open-mid vowel /ɔ/, that is present in the inventory of Khowar. The word /pen.səl/ is adjusted with only one change, therefore, the LD value is 1. The vowel /ə/ is replaced with the front /ɪ/ vowel. Finally, /ɪnsəlɪn/ is adjusted with the two changes in its structure. The /ə/ changes into the rounded vowel /ʊ/ and the /ɪ/ is elongated. Thus, the LD value is two. These values indicate that certain vowel sounds present in English are absent in the phonemic repertoire of Khowar, therefore, adaptation of English words into Khowar results in alterations or variations in vowel sounds.

Adaptation of /ʌ/

Giegerich (1992) characterizes this vowel as unrounded and positioned slightly further back than front. Roach (2009) explains that "The /ʌ/ is a central vowel, it is more open than the open-mid tongue height. The lip position is neutral" (p.14). It is one of the short vowels that English possesses. The central vowels, /ə/ and /ʌ/, share significant similarities, but the tongue remains slightly lower for /ʌ/. Both sounds involve relaxed or neutral lip positions. The primary distinction between these vowels lies in their occurrence within specific syllabic stress patterns: /ə/ is exclusive to unstressed syllables (e.g., as in 'annoy', 'banana'), while /ʌ/ appears solely in stressed syllables e.g., 'shut', 'rough' (Kang et al., 2018). However, the Khowar phonemic inventory lacks the lower-mid back unrounded vowel /ʌ/. Therefore, a faithful adaptation of the English input vowel /ʌ/ is not anticipated. Put simply, this vowel must be mapped to its Khowar's phonologically closest available vowel. The table below will elucidate how this vowel is adjusted in Khowar.

Table 8
Adaptation of /ʌ/

S.no	IPA Transcription		Khowar	Gloss	Phonemic Transcription
a.	/bʌs/	bɑs	Bus	[ʌ]→[ɑ]	
b.	/kʌp/	kɑp	Cup	[ʌ]→[ɑ]	

c.	flʌʃ	fɑlɑʃ	Flush	Ø →[ɑ], [ʌ]→[ɑ]
d.	pʌmp	pɑm	Pump	[ʌ]→[ɑ], p →[Ø]
e.	ʌŋ.kəl	ãn kɑl	Uncle	/ʌ/→ [ã], /ə/ → [ɑ]
f.	ʌpˈdeɪt	ɑpˈde:t	Update	[ʌ]→[ɑ], /eɪ/ → [e:]
g.	tʌn.əl/	tɑ.ne:l	Tunnel	[ʌ]→[ɑ], /ə/ → [e:]
h.	nʌm.bər	nɑm.bɑ:r	Number	[ʌ]→[ɑ], /ə/ → [ɑ:]

The data presented in the table reinforces the assertion that Khowar lacks the central vowel /ʌ/. English loanwords, given in the table, exhibit this vowel in various placements. These loanwords are mono and well as disyllabic. The monosyllabic loanwords are as follows:

(5)   a. bʌs → [ɑ]

c. kʌp → [ɑ]
b. flʌʃ → [ɑ]

d.pʌmp →[ɑ]

In these loanwords the vowel /ʌ/ serves as the nucleus occurring at the word's medial position. Khowar does not allow consonant clusters at both onset and coda positions. Therefore, the consonant clusters at the monosyllabic loanwords /flʌʃ/ and /pʌmp/ are adjusted through vowel epenthesis and consonant deletion. The back unrounded vowel /ɑ/ is inserted in case of /fɑlɑʃ/ to break the CC at the onset position and voiceless stop /p/ is deleted in /pɑmp/ to avoid the CC at the coda position. The rest of the English loanwords where the vowel /ʌ/ has been used are all disyllabic. They are;

(6)   e. ʌŋ.kəl → [ã]

f. ʌpˈdeɪt →[ɑ]

g. tʌn.əl → [ɑ]

h.   nʌm.bər → [ɑ]

The loanwords ʌŋ.kəl, and ʌpˈdeɪt, consist of two syllables, with the central vowel placed at the beginning of the word. In contrast, words like tʌn.əl and nʌm.bər are also disyllabic, but the vowel appears word medial in the initial syllable. In all these words the central vowel /ʌ/ is consistently substituted with its phonologically closest vowel i.e. the open-back unrounded vowel /ɑ/. Interestingly, the loanwords, /ʌŋ.kəl/ and /nʌm.bər/ showcase two distinct instances of central vowels appearing in onset and word-medial positions. In both cases, these central vowels are substituted with the back unrounded vowel /ɑ/. The subsequent loanword /ʌpdeɪt/ also

features the vowel at the onset position, and its adaptation follows a similar pattern to the preceding word, and the complex vowel that is avoided in Khowar, is substituted with a simple, pure vowel /e:/. Since Khowar lacks both the complex vowel /eɪ/ and central vowel /ʌ/, therefore if these vowels are used in the loanword, they are mostly substituted with the phonemes /ɑ/ and /e/. The realization of the English vowel /ʌ/ as /ɑ/ in the given examples appears to be a result of phonological approximation. While the English vowel is articulated at a slightly higher level, both are classified as low vowels. Neither vowel involves lip rounding during articulation. Consequently, selecting the vowel /ɑ/ as a replacement for the English vowel /ʌ/ appears to be influenced by

phonological approximation and that /ɑ/ is present in the phonemic inventory of Khowar. The vowel that is most similar to this one in Khowar is the emphatic allophone of the low front short vowel [ɑ]. Thus, it can be inferred from the adaptation patterns shown in table (3), that the English vowel /ʌ/ is mapped directly to the Khowar vowel [ɑ]. The orthography does not play any role in the adaptation of this vowel. For example, the sound /ɑ/ in the source forms is represented in writing by the grapheme <u>, therefore ideally it should be adapted using the /ʊ/ sound. However, the typical mapping of /ʌ/ into /ɑ/ shows that orthography has no influence in the adaptation of the mid-back unrounded vowel /ʌ/ and that /ʌ/ is regularly mapped into the English /ɑ/.

The table below shows the LD values of the adjusted loanwords.

Table 9

LD between the loanwords

	a.	b.	c.	d.	e.	f	g	H
	/b ʌ s /	/k ʌ p/	/f l ʌ ʃ/	/p ʌ m p/	/ʌ ŋ k ə l/	/ʌ p d eɪ t	/t ʌ n ə l/	/n ʌ m b ə r
	b ɑ s	k ɑ p	f ɑ l ɑ ʃ	p ɑ m	/ãn k ɑ l/	/ɑ p d e: t	/t ɑ n e: l/	n ɑ m.b ɑ: r
	↓	↓	↑ ↓	↓ ↑	↓ ↓	↓ ↓	↓ ↓	↓ ↓
LD Value	1	1	2	2	2	2	2	2

The Levenshtein distance algorithm shows the deviation in the given loanwords. The table illustrates the loanwords in their original form and the count of variations following the adjustment. The first two loanwords show the distance value of one. It is because only one phoneme is substituted. The rest of the loanwords show a distance value of 2, as two phonemes are altered to adjust these loanwords according to the phonological rules of Khowar. It is concluded that English loanwords experience phonological alterations during their integration into Khowar. Additionally, the substitution method is employed to modify the mid-back unrounded vowel /ʌ/ into /ɑ/.

4.2 Adaptation of Diphthongs

As analyzed in previous sections, English monophthongs that are not found in Khowar are substituted with Khowar vowels having similar phonetic features. Sounds that consist of a movement or glide from one vowel to another are called diphthongs (Roach, 2009). English possesses a greater variety of diphthongs. According to Roach (2004), RP includes eight diphthongs, specifically /eɪ/, /aɪ/, /ɔɪ/, /əʊ/, /aʊ/, /ɛə/, /ɪə/, and /ʊə/. Within English diphthongs, the vowels /eɪ, aɪ, ɔɪ, əʊ, aʊ/ are classified as closing diphthongs. In these, the initial element can either be a mid or low vowel, while the second element is exclusively a high vowel. Conversely, the remaining three diphthongs /ɛə, ɪə, ʊə/ are categorized as centering diphthongs, where mid and high vowels can serve as the

initial element, and the second element is confined to a mid-vowel /ə/. However, Khowar does not include any diphthongs in its phonemic inventory (Liljegren & Khan, 2016; Khan et al., 2021). The literature shows that certain adaptation processes such as vowel deletion, vowel substitution, and glide insertion are used to adjust the illicit diphthongs (Clements, 1986). It will be interesting to see how Khowar manages to adjust the English loanwords that contain diphthongs.

Adaptation of /əʊ/

The /əʊ/ represents a diphthong, signifying the combination of two vowel sounds articulated within a single syllable. The sound /əʊ/ in the source forms is represented in writing by the graphemes <o>, and results from the blending of /ə/ with /ʊ/. Similar to pure vowels, diphthongs are articulated within the mouth and are voiced, requiring the vibration of the vocal cords to produce the sound (Roach, 2009). As the /əʊ/ diphthong is articulated, the mouth undergoes a shift in position and shape since the diphthong merges two vowel sounds during pronunciation. This occurrence of vowels is prohibited in multiple languages including Khowar and various strategies have been observed across different languages to avoid diphthongs. While the most frequently observed method to prevent diphthongs is through the deletion of the first vowel (Casali, 2011). There are instances in several languages where complete substitution of a diphthong has also been documented. Khowar does not allow the occurrence of diphthongs in its syllables therefore the analysis of the given data will elucidate how the English loanwords having diphthongs are adjusted.

Table 10

Simplification of /əʊ/

S.no	IPA Transcription	Khowar	Gloss	Phonemic Transcription
a.	kəʊt	kɔt	Coat	/əʊ/→ [ɔ]
b.	vəʊt	vɔ:t	Vote	/əʊ/→ [ɔ:]
c.	/fəʊm/	fɔ:m	Foam	/əʊ/→ [ɔ:]
d.	rəʊd	rɔ:t	Road	/əʊ/→ [ɔ:], /d/ → [t]
e.	fəʊtəʊ	fʊtʊ	Photo	/ə/→[Ø],
f.	ki:.ləʊ	kɪ.lʊ	Kilo	/ə/→[Ø],
g.	her.əʊ.ɪn	hɪrɔ.ji;n	Heroine	/e/→ [ɪ], /əʊ /→ [ɔ], [Ø] →j, /ɪ/ →[i:]
h.	vɪd.i.əʊ	vɪdɪjʊ	Video	[Ø] →/j/, /ə/→[Ø],

The data on the table indicate that /ɔ/ and /ʊ/ are the very common phonemes used to replace the English diphthong /əʊ/ in Khowar. Khowar uses both the short as well as long vowels as a replacement for English diphthongs. In the loanword /kəʊt/, a short open mid-rounded vowel /ɔ/ has substituted the complex vowels whereas in /vəʊt/, /fəʊm/, and /rəʊd/, the vowel is lengthened. In contrast, the loanwords fəʊtəʊ and ki:.ləʊ are adjusted using the technique of vowel elision where the first segment of the diphthong is deleted. The data /fəʊtəʊ/ consists of two syllables, and each syllable contains the /əʊ/ diphthong. The adjustment involves maintaining the back close vowel /ʊ/ in both of these syllables. The results indicate that English loanwords with /əʊ/ are simplified in two ways. One by the deletion of the first vowel where the original diphthong /əʊ/ in English loanwords transforms into the monophthong [ʊ] after

adjustment. It is assumed that the reason for omitting the first vowel is that Khowar does not have the mid-central vowel /ə/, also known as schwa. Thus, it is deleted during adjustment of the English loanwords having /əʊ/ diphthong. The second way is to completely substitute the diphthong with a different single vowel.

It is interesting to see how the phenomenon of vowel hiatus is dealt with in Khowar. Vowel hiatus denotes the presence of two successive vowels in separate syllables. This phenomenon is prohibited in numerous languages, and various techniques have been observed cross-linguistically to avoid it. Khowar does not have any word having consecutive vowels in its adjacent syllables. The analysis shows that vowel substitution and glideformation are the techniques employed to deal with vowel hiatus. The loanwords /her.əʊ.ɪn/ and /vɪd.i.əʊ/ contain vowels in two adjacent syllables. Substitution of the first vowel is one of the most common strategies for avoiding vowel hiatus, therefore, to adjust the loanword /her.əʊ.ɪn/, Khowar first of all substitutes the diphthong /əʊ/ with simple /ɔ/. Then there in an insertion of glide /j/. A somehow distinct pattern is followed to adjust the loanword /vɪd.i.əʊ/. To prevent vowel hiatus, as suggested by Clements (1986), altering the initial vowel into a glide has been observed in various languages. Thus, the first vowel of the diphthong /əʊ/ is altered into a glide /j/, and the second segment is preserved. Hence /vɪd.i.əʊ/

becomes /vɪdɪjʊ/ after adjustment. I assume that one major reason for not allowing vowel hiatus in Khowar is because, having two consecutive vowels in separate syllables results in a vowel-initial syllable, which is consistently avoided according to the syllable structure of the language. As previously mentioned, if there is a disyllabic word in Khowar the second syllable most of the time begins with an onset. This may be the case as to why vowel hiatus is avoided. Thus, in adapting English loanwords to Khowar, any instances of vowel hiatus should undergo a resolution to align with the phonotactic constraints of the language. This adjustment of the diphthong supports the phonological repair or phonological stance model by LaCharite and Paradis which claims that upon integration into the target language, loanwords undergo specific modifications due to differences in the phonotactic structures of human languages. Consequently, when these loanwords are adapted into the recipient language, they show alterations due phonological constraints of that language.

The Levenshtein distance algorithm will further explain the changes in the English loanword after adjustment in Khowar. The Levenshtein distance calculates the distance in pronunciation between two strings by figuring out how many substitutions, insertions, and deletions are needed to change one transcribed string into another (Kruskal 1983).

Table 11

LD between the loanwords

	a.	b.	c.	d.	e.	f.	g.	h.
	/k əʊ t/	/v əʊ t/	/f əʊ m/	/r əʊ d/	/f əʊ t əʊ/	/k iː l əʊ/	/v ɪ di ə ʊ/	/h e r əʊ ɪ n/
	k ɔ t	v ɔː t	f ɔː m	r ɔː t	f ʊ t ʊ	k ɪ l ʊ	v ɪdɪ j ʊ	h ɪ r ɔ j iː n
	↓	↓	↓ ↓	↓ ↑ ↑		↓ ↑	↑	↓ ↓↑↓
LD Value	1	1	1	2	2	2	1	4

The distance value ranges from 1 to 4. The loanwords like /kəʊt/, /vəʊt/, /fəʊm/, and /rəʊd/ are all monosyllabic taking the sequence of vowels in their syllables. The LD values of these loanwords are 1 because only the vowel sound [ɔ(:)] is replacing the diphthong. However, the monosyllabic loanword /rəʊd/ shows an LD value of two. The reason behind this is that Khowar often prefers to end in voiceless coda, therefore, the loanwords having voiced coda are often devoiced. The voiced stop /d/ in the loanwords is replaced by the voiceless stop /t/ and the diphthong is substituted by /ɔ:/. The rest of the loanwords are disyllabic having different LD values. For example, both the syllables of /fəʊtəʊ/ contain the diphthongs, and in both of them the first vowel is deleted, and the second vowel is preserved, therefore, /əʊ/ is changed into /ʊ/. In the loanword /ki:ləʊ/, the long close-front vowel i: is substituted with its short allophonic form /ɪ/, and the diphthong is reduced to a pure vowel thus it also shows the LD value of two. Changing the first vowel into a glide to avoid vowel hiatus is a common practice. The loanword /vɪdiəʊ/ has been simplified by

changing the first segment of the diphthong with a glide /j/ while preserving the second vowel /ʊ/. Thus, the LD value is only one. The loanword that shows the greatest number of phonemic changes is /herəʊɪn/. The phonemes /e/, /əʊ/, and /ɪ/ are substituted while the glide /j/ is inserted, therefore its LD value is four.

Adaptation of /eɪ/

Diphthongs consist of two vowels combined. They differ from single vowels as they involve sounds produced by shifting your lips, tongue, and mouth, whereas pure vowels are articulated with a stable mouth position having no glide. Similarly, the /eɪ/ is a diphthong, composed of the midfront vowel /e/ combined with the short vowel /ɪ/. The diphthongs are not permitted in the recipient language; consequently, Khowar prohibits the placement of falling diphthongs in the nucleus of a syllable. Since Khowar lacks this combination of vowels, it is important to see how the English loanwords containing this sequence of vowels are adjusted.

Table 12

Simplification of /eɪ/ in monosyllabic loanwords

S.no	IPA Transcription	Khowar	Distance Value	Gloss	Phonemic Transcription
a.	/geɪt/	g e:t	1	Gate	[ɪ]→[Ø], /eɪ/→ [e:]
b.	/reɪl/	re:l	1	Rail	[ɪ]→[Ø], /eɪ/→ [e:]
c.	/teɪp/	te:p	1	Tape	[ɪ]→[Ø], /eɪ/→ [e:]
d.	/keɪs/	ke:s	1	Case	[ɪ]→[Ø], /eɪ/→ [e:]
e.	/keɪk/	kek	1	Cake	[ɪ]→[Ø], /eɪ/→ [e]
f	/geɪm/	ge:m	1	Game	[ɪ]→[Ø],/eɪ/→ [e]

The distinguishing feature of closing diphthongs is that they all end with a glide toward a closer vowel (Roach 2000). The /eɪ/ is one of the closing diphthongs of English. In Khowar, this particular diphthong is not present. Consequently, the /ei/ diphthong in English loanwords is monophthongized by a single pure vowel like /e/ as in the case of /keɪk/ and /brek/

or /e:/ in the rest of the loanwords. The above data contains all the monosyllabic words having the closing diphthong /eɪ/. The two adjacent vowels /eɪ/ in these loanwords occupy the nucleus position. However, the phonotactic constraints of Khowar do not allow the occurrence of diphthongs in its syllables, therefore they are adjusted according to the

phonological system of Khowar. Rather than creating a glide, Khowar native speakers tend to pronounce the /eɪ/ as a monophthong and with a slightly lengthened vowel. As previously noted, the distinction between a monophthong and a diphthong depends on the presence or absence of a glide. In case of the English loanwords having the/ei/ sound, Khowar entirely removes the glide and uses a single vowel instead. Therefore, no .

glide formation is attested in the adaptation of this diphthong at all. It is thus concluded that /eɪ/ is always monophthongized. The /eɪ/ is realized as a long vowel /e:/ most of the time and a short vowel /e/ in some cases.

The distance algorithm will further explain the alterations in the structure of loanwords. The table below contains the loanwords both in their original form and after being adjusted

Table 13

LD between the loanwords

	a.	b.	c.	d.	e.	f
	/g eɪ t /	/r eɪ l	/t eɪ p	/k eɪ s/	/k eɪ k/	/g eɪ m/
	g e:t	r e: l	t e: p	k e: s	k e k	g e: m
	↓	↓	↓	↓	↑	↓
LD Value	1	1	1	1	1	1

The Levenshtein distance algorithm indicates the deviations in the loanwords after adjustment. The loanwords are all monosyllabic containing the /eɪ/ as the head of the syllable. As mentioned earlier Khowar does not allow the syllable to take the sequence of vowels, therefore, English loanwords consisting of diphthongs will normally undergo the process of monophthongization in a bid to become nativized into the Khowar lexicon. The loanwords given above are all deviating from their original form. In all of the loanwords the complex vowel /eɪ/ is substituted with a singleton

phoneme /e/ and its longer version /e:/. Since this is the only change in the structure of the loanwords, thus the LD value is one in all of them.

Adaptation of /aɪ/

A diphthong comprises two vowel sounds combined, thus possessing both an initial and a final position within the mouth. The diphthong /aɪ/ suggests the diphthongal movement from /a/ to /ɪ/. Below are the English loanwords containing the /aɪ/ vowel. The adjustment of this diphthong in Khowar has been analyzed in detail.

Table 14

Simplification of closing diphthong /aɪ/

S.no	IPA Transcription	Khowar	Distance Value	Gloss	Phonemic Transcription
a.	/laɪt/	la.jɪt	1	Light	Ø →[j]
b.	/taɪt/	ta.jɪt	1	Tight	Ø →[j]
c.	/paɪp/	pa.jɪp	1	Pipe	Ø →[j]
d.	/faɪl/	fa.jɪl	1	File	Ø →[j]
e.	/baɪk/	ba.jɪk	1	Bike	Ø →[j]

The provided data contains the /aɪ/ diphthong in the medial position of the English loanwords. Since Khowar phonotactics often avoid the diphthongs and the Khowar phonemic inventory includes the palatal approximant /j/, therefore the diphthong gets altered by adding the sound /j/ to avoid the sequence of vowels. The palatal approximant is frequently viewed as the semi-vocalic counterpart to the close front unrounded vowel [ɪ]. The insertion of /j/ between the components of diphthongs signifies a change in the structure, potentially leading to the transformation of a diphthong into a single vowel sound. The English loanwords that include the /aɪ/ diphthongs undergo adaptation by utilizing a glide insertion technique. Essentially, the coronal glide /j/ is inserted in between the sequence of vowels /a/ and /ɪ/. Although the native grammar of Khowar usually follows the strategy of monophthongization as in the case of /eɪ/ in realizing English diphthongs, the /aɪ / is adjusted using glide insertion technique.

The loanwords in table no (14) show the typical adjustment of the English diphthongs /aɪ/ in Khowar that involves mapping them to a short vowel [a] accompanied by the glide [j]. Thus, the glide [j] breaks apart the English diphthongs /aɪ/. Considering the syllable pattern in Khowar and its constraint of avoiding vowel sequence, my argument is that the segments [a] and [j] provided in the adjusted forms of all the loanwords in table (14) represent distinct phonemes instead of diphthongs. The rationale behind this argument arises from syllabification.

Glides typically manifest in syllable margins, occupying either onset or coda positions, while low vowels consistently take up nucleus positions within the syllable. For example, the English loanword "light" / laɪt / is adjusted in Khowar as [la. jɪt]. It is worth noticing that while the source form is monosyllabic which consists of one syllable, the adapted form is disyllabic contains two syllables. The insertion of glide has increased the syllables' weight. Furthermore, the initial syllable of the adapted form is open, ending with the first element of the diphthong [a] as its nucleus. Then, there is an insertion of the glide /j/ that occupies the onset position of the second syllable. This reasoning of separating the two segments /a/ and /j/ as distinct sound segments rather than considering them a diphthong aligns with Watson's (2002) explanation regarding the distinction between vowels and glides. She states that despite high vowels and glides having comparable characteristics regarding their place and manner of articulation (both ɪ and j are high coronals) the factor of syllabification serves as the distinguishing factor between high vowels and glides. Within Khowar phonetics, high vowels are typically found in nucleus positions, while glides are exclusively present in either onset or coda positions. Thus, it is concluded that in the adaptation of the /aɪ/ diphthong, glide insertion is used.

The distance algorithm will further elucidate the alterations in these loanwords. The loanwords are given in the table below and LD values are displayed as well.

LD between the loanwords

	a.	b.	c.	d.	e.
	/l a ɪ t/	/t a ɪ t/	/p a ɪ p/	/f a ɪ l/	/b a ɪ k//
	l a j ɪ t	t a j ɪ t	p a j ɪ p	f a j ɪ l	b a j ɪ k
	↑	↑	↑	↑	↑
LD Value	1	1	1	1	1

There is an insertion of only one phoneme that is glide /j/ and this epenthetic glide has no counterpart in the source word. The loanwords given are all monosyllabic having the diphthong occupying the nucleus. The insertion of the /j/ has broken the diphthong and since this is the

only notable change in the structure of the loanword therefore all the loanwords show the LD value of one. This insertion has increased the syllable weight.

4.3 Findings and Discussion

The findings of the study are gained after analyzing the data. While reporting the findings the emphasis is placed on the adjustment of vowels observed in English loanwords as they are integrated into Khowar. In an attempt to explore the adaptation of English vowels in Khowar, it was essential to determine if Khowar speakers use English loanwords in their daily conversation. Therefore, the researcher employed the selfobservation technique as a method to collect data for this investigation. This method aided in collecting relevant data and in understanding how Khowar speakers articulate English words in different domains. The findings show that Khowar has extensively borrowed English loanwords that are spoken by Khowar speakers in their daily lives. These loanwords contain vowels that are not present in the phonemic inventory of Khowar. Therefore, they are altered to fit into the sound system of Khowar. The main aim of this study was to examine the English vowels that are lacking in Khowar. The findings show that certain vowels in English are lacking in Khowar. This includes three monophthongs and three diphthongs, the central vowels /ʌ/ and /ə/ and the back vowel /ɒ/ and the closing diphthongs are found missing in Khowar's phoneme inventory.

The findings reveal that while /ʊ/ is present in the phonemic inventory of Khowar, the /ɒ/ is lacking therefore it is adjusted with the already available open back unrounded vowel [ɑ (:)]. This vowel sound is adjusted using the technique of substitution. Concerning adaptation of /ɒ/ as /ɑ:/, the results indicate that when the loanword takes the rounded vowel /ɒ/ in a closed syllable, it is replaced with the long vowel /ɑ:/. However, when it is an open syllable, the vowel is adjusted using the short open-back vowel /ɑ/. For example, /bɒm/ → /bɑ:m/ and /kɒ.pi/ → /kɑ. pɪ/. Khowar and Pashto share similarities in the adjustment of this particular vowel sound. The same loanword /bɒm/ is adjusted in Pashto as/ bɑm/ (Iqbal & Ullah, 2023). Similarly in Punjabi and Urdu /ɒ/ is not present, therefore, /ɑ/ and /ɔ/ are the closest matches to the English /ɒ/. For instance, the loanword /kɒpɪ/ is adjusted with the substitution of /ɒ/ with /ɑ/ as /kɑpɪ/ (Hussain et al., 2011). Another language that lacks this vowel sound is Bemba, a language spoken in north-eastern Zambia (Kennedy, 2017). The back low vowel /ɒ/ is realized as /o/ in Bemba. For example, /lɒk/ is converted into /loko/ after its adjustment. However, Khowar adjusts it with a different vowel that is back unrounded vowel /ɑ/ and its longer version /ɑ:/.

The most commonly used central vowel is the /ə/, also called a schwa. The findings show that in the context of Khowar, the utilization of /ə/ is infrequent, therefore, during the adaptation process, a notable variation is anticipated. Since Khowar lacks the /ə/ vowel, therefore it is realized as /e/ and /ɑ/ most of the time as these vowels are phonologically-closest to the mid-central vowel /ə/. The results further elucidate that apart from phonological approximation, orthographic factors impact the adaptation of the English schwa in Khowar. The graphemes in source words, like (o, u, i, e, a...), determine how the schwa sound /ə/ is adapted, especially when not mapped to /ɑ/ or /e/. For example, loanwords like /pet.rəl/, /pen.səl/, and /ɪnsəlɪn/ become /pɪt.rɔl/, /pen sɪl/, and /ɪn.sʊ.li:n/ in Khowar, influenced by the presence of 'o,' 'i,' and 'u' graphemes. Likewise, Khowar, many languages of the world do not have this vowel sound in their phonemic inventory. Beel and Felder (2013) claim that Turkish does not have the /ə/ sound. Therefore, they replace it according to their sound system. For example, in the English loanwords [kəltʃər], the /ə/ is replaced with /ʊ/. Thus, the word [kəltʃəɹ] is pronounced as [kʊltür] (Beel & Felder, 2013). Similarly, according to Iqbal and Ullah (2023), Pashto lacks the /ə/ vowel therefore the unrounded vowel /a/ substitutes it. Furthermore, Qassimi Arabic does not have the /ə/ vowel as well (Alhoody, 2019). Thus, the English vowel /ə/ is adapted regularly as /a/. For instance, the loanword /ˈkeɪ.bəl/ is adjusted with the substitution of /ə/ vowel. Zaigham et al. (2022) observed that Urdu replaces /ə/ with /ʊ/ at word-final syllables. For instance, the loanword /tæblət/ is adapted with the replacement of /ə/ in the final syllable. Thus /tæblət/ becomes /tæblʊt/ after the adjustment. Just like these languages the schwa /ə/ is missing in Khowar and is adjusted using the technique of vowel substation.

The study's findings reveal that the Khowar phonemic inventory does not include the lower-mid back unrounded vowel /ʌ/. Therefore, a faithful adaptation of the English input vowel /ʌ/ was not anticipated. In simpler terms, this vowel must be mapped to its Khowar's phonologically closest available vowel which is /ɑ/. Furthermore, the typical mapping of /ʌ/ into /ɑ/ shows that orthography does not influence the adaptation of the midback unrounded vowel /ʌ/ and that /ʌ/ is regularly mapped into the English /ɑ/. Kennedy (2017) claims that this vowel is lacking in the phonemic inventory of Bemba. It is thus substituted with /a/, which is purely based on phonetic approximation. Tiv, a language spoken in some parts of Nigeria, lacks this vowel sound (Aor, 2021). "Tiv phonology approximates /ʌ/ to /ɔ/ or /ɔ:/ ([o] or [ôô] spellings) hence /ʌ/ is not found in the Tiv language" (Aor, 2021, p. 6). Unlike Tev, the approximate of the central vowel /ʌ/ in Khowar is /ɑ/. One of the English monophthongs that do not have correspondents in Thai is the central vowel /ʌ/. It is typically mapped to their closest phonetic match in the native inventory; thus it is realized as [a] or [a:], for instance, the English loanword /mʌ.mi/ is adjusted as /mam.mî/ (Phetkla, 2020).

2   English has a total of eight diphthongs (Roach, 2009). While Liljegren and Khan, (2016) claim that Khowar does not possess any diphthongs or triphthongs. This study supports this claim. Three closing diphthongs eɪ, aɪ, əʊ were analyzed and it was found that neither of them exists in Khowar. These complex vowels are adjusted in Khowar using different strategies. These strategies include vowel elision, vowel substitution, and glide insertion. For example, the diphthong /əʊ/ is adjusted in Khowar in three different ways. Although the predominant approach to avoid diphthongs is often the deletion of the first vowel, as noted by Casali (2011), there are instances in various languages where a complete substitution of a diphthong has been recorded. Another strategy employed for adjusting this vowel sound involves glide insertion. Khowar uses both the short as well as long vowels as a replacement for English diphthongs for instance in /kəʊt/ the /əʊ/ → [ɔ] and in /vəʊt/ → [ɔ:]. Vowel elision is also observed in the loanword /fəʊtəʊ/. The first segment of the diphthong is deleted, and the

second segment is preserved. The reason for this is that Khowar contains the /ʊ/ in its inventory, and it lacks the /ə/. This may be the reason why the elision of the first segment happens. The findings also indicate that vowel hiatus is prohibited in Khowar. Khowar does not have any word having consecutive vowels in its adjacent syllables. The analysis shows that vowel substitution and glide-formation are the techniques employed at the same time to deal with vowel hiatus. The findings show that vowel hiatus creates an onset-less syllable that is prohibited in Khowar specifically when it is a disyllabic word. Therefore word like /vɪd.i.əʊ/ containing vowel hiatus undergo a resolution to align with the phonotactic constraints of the language. Just like Khowar, /əʊ/ is repaired differently in different languages of the world. According to Karamat (2001), Punjabi lacks diphthongs. Hussain et al. (2011) expressed the view that Punjabi substitutes English loanwords with a singleton phoneme. The same loanword /rəʊd/ is adjusted with the substitution of the diphthong, /ro:d/. The phoneme /o:/ is frequently employed to replace the English diphthong /əʊ/ in Punjabi (Hussain et al., 2011). However, Khowar employs /ɔ/, /ɔ:/, /ʊ/, and /j/ to avoid this sequence of vowels. In Yoruba, the loanwords containing /əʊ/ showcase the straightforward process of monophthongization. The diphthong is changed either to [o] or [ɔ] (Oyinloye, 2020). The loanword /fəʊtəʊ/ is adjusted with the substitution of the complex /əʊ/ vowel with a simple one /ɔ/. Thus, /fəʊtəʊ/ becomes [fɔtɔ] after adjustment (Oyinloye, 2020). In the Qassimi Arabic inventory, the closing diphthong /əʊ/ is absent. However, akin to numerous other Arabic dialects, Qassimi Arabic includes the mid-back rounded vowel /o:/. Hence, there is an anticipation that English vowels like /əʊ/ would correspond to their closest phonological match in Qassimi Arabic, often [o:]. For example, the word /gəʊl/ is adjusted as [go:l] with the substitution of a diphthong with a monophthong (Alhoody, 2019). Similarly, Urdu speakers also substitute the /əʊ/ diphthong with a single short vowel /ɔ/, for example [təʊst] is pronounced as [tɔst] (Zaigham et al., 2022; Kalsoom et al., 2019). The English loanword /kəʊt/ is adjusted in the African language Kinyarwanda with the substitution of the diphthong /əʊ/ with a simple vowel /ɔ/. It is

pronounced as /kɔ.te/ in Kinyarwanda (Kayigema, n.d.). However, Khowar in addition to substitution applies other strategies to adjust the diphthong that include vowel elision as well as glide insertion.

The /ei/ diphthong in English loanwords undergoes monophthongization, manifested by a single pure vowel such as /e/, as seen in examples like /keɪk/ or /e:/ in /geɪt/. The findings indicate that, instead of introducing a glide, Khowar native speakers consistently transform the /eɪ/ into a monophthong. In instances where English loanwords feature the /ei/ sound, Khowar eliminates the glide entirely, opting for a solitary vowel. Hussain et al. (2011), mention that Urdu as well as Punjabi do not have the /eɪ/ diphthong. Therefore, such diphthongs in English loanwords undergo either replacement by a single phoneme or the loss of their second element, with the first element being elongated. For example, the word date /deɪt/ is adjusted by removing the second element of the diphthong and making the first element lengthened as /de:t/ (Hussain et al., 2011). Furthermore, in Pashto /eɪ/ diphthong does not exist therefore, such a sequence of vowels is adjusted with a short vowel. In the English loanword case, /keɪs/, the diphthong /eɪ/ is replaced with a monophthong /e/ as /kes/ (Iqbal & Ullah, 2023). Yaruba also does not have this sequence of vowels in its inventory, thus the underlying diphthong /eɪ/ in the English source becomes the monophthong [e] in the Yorùbá adapted form. For instance /teɪbl/ becomes /tébù/ after adjustment (Oyinloye, 2020). Similarly in Khowar, the /ei/ diphthong in English loanwords undergoes monophthongization, manifested by a single pure vowel such as /e/ or /e:/.

Regarding another closing diphthong /aɪ/, the given data includes the /aɪ/ diphthong positioned medially in English loanwords. Given that Khowar phonotactics typically steer clear of diphthongs and considering the presence of the palatal approximant /j/ in the Khowar phonemic inventory, the diphthong undergoes modification by incorporating the sound /j/ to prevent a sequence of vowels. Pashto does not have diphthongs in its phonemic inventory. When such complex diphthongs occur in the medial position of a loanword it is adjusted with a glide in Pashto. For example, the English word /naɪt/ is adjusted as /najit/ with the insertion of glide /j/ (Iqbal,

2021). Qassimi Arabic lacks diphthongs as well and, as a result, modifies them by substituting with monophthongs or employing the glide-formation technique. To clarify, the latter parts of the English diphthongs /ɪ/ and /ʊ/ are substituted in Qassimi Arabic with the matching coronal and labial glides /j/ and /w/, respectively. The similar loanword /taɪm/ is adjusted using glide /j/ as /ta:.jam/ (Alhoody, 2019). Likewise, Khowar's phonotactics does not permit the occurrence of vowels in between syllables, therefore, the glide insertion technique is used to adjust words having /aɪ/ diphthong.

Finally, the findings reveal that these vowels have been adjusted according to the sound pattern of Khowar. None of these loanwords show zero phonemic change or have zero distance value. All of them are altered as is obvious in the LD value of these loanwords. The LD values range from 1 to 4 which means that these loanwords have changed their phonemes singularly or multiple times to be adjusted in Khowar. The Levenshtein Distance Algorithm helped point out the number of phonemic changes during the adaptation of these loanwords.

5. Conclusions

This paper has conducted a descriptive study on the adaptation of English loanwords with pure vowels and diphthongs in Khowar. It is concluded that the phonemic inventory of Khowar lacks some vowel sounds that are present in English. This includes the central vowels /ə/ and /ʌ/ and the back vowel /ɒ/. It is also concluded that the diphthongs that are an important part of the English vowel inventory are lacking in Khowar. As such three closing diphthongs were analyzed and it is concluded that vowel substitution, vowel elision, and glide insertion are some of the techniques that are applied to adjust the illicit vowels during adaptation of English loanwords in Khowar. This paper supports LaCharite & Paradis' (2005) Phonological Repair Model, as loanwords are acquired and altered phonologically to conform to the system of the recipient language.

5.1 Recommendations

This research study analyzed only three monophthongs and three diphthongs; therefore, it is recommended that another study needs to be undertaken that should include other English

phonemes that are missing in Khowar. Furthermore, the closing diphthongs have been analyzed when they occur in the word's medial position, however, they can be analyzed at the word's initial and final position. For instance; the /aɪ/ at initial and end needs further investigation to get an accurate result.

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