PHONOLOGICAL ADAPTATION OF ENGLISH LOANWORDS IN KHOWAR: AN OPTIMALITY ANALYSIS

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Candidate of **Master of Philosophy** at the National University of Modern Languages do hereby declare that the thesis **Phonological Adaptation of English Loanwords in Khowar: An Optimality Analysis** submitted by me in partial fulfillment of MPhil degree, is my original work, and has not been submitted or published earlier. I also solemnly declare that it shall not, in future, be submitted by me for obtaining any other degree from this or any other university or institution.

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ABSTRACT

Title: Phonological Adaptation of English Loanwords in Khowar: An Optimality Analysis

Language contact results in the transfer of lexical items from one language to another. The transferred lexical items are named as loanwords. This study deals with the adjustment of English loanwords into Khowar. English and Khowar are two different languages that present dissimilarities at the phonemic, syllabic, and structural levels. Both languages share a long history of contact situations. Due to this interaction between these languages, there is a transfer of lexical items. English being the dominant language, lends many words that are adjusted into Khowar. This research first aims to identify the English loanwords that have entered Khowar. Secondly, it aims to investigate the processes involved in the adjustment of the English loanwords. Finally, it seeks to identify the phonotactic constraints of Khowar. The adjustment of these loanwords is analyzed through the lens of Optimality Theory. OT remains instrumental in explaining why the recipient language tends to favor certain adaptation processes during loanword adaptation. Optimality Theory (OT) explains how the input, such as the English loanword, is mapped onto an output using the ranking of constraints. The data for this research study is collected from different semantic domains using the technique of participant observation. An audio recorder and two dictionaries are used as research instruments. With an audio recorder, the researcher collects all the spoken data from the conversation of Khowar speakers. To validate whether the collected data is actually a loanword or not, Khowar dictionaries are utilized. The important findings of this study are first, Khowar borrows many words from English to fill the lexical gaps. Additionally, they provide extra lexical items for an already existing word. Secondly, three repairing techniques i.e., deletion, substitution, and epenthesis are found to be used to adjust the illicit structure of English loanwords. Among these techniques, substitution is the dominant one. Third, Khowar phonotactics does not often allow complex onset or coda. Similarly, the voiced coda in the loanwords is adjusted using the technique of coda-devoicing. Finally, it uncovers that complex vowels are prohibited within the phonotactic rules of Khowar.

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LIST OF ABBREVIATIONS

***CC] σ-**	No cluster of consonants at coda position
***[σ CC-**	No cluster of consonants at onset position
***CODA/ *C] σ-**	Syllable should be open
***COMPLEX CC-**	Consonant clusters are not allowed
***ə-**	No /ə/ in between consonants
***ɪ-**	Epenthetic /ɪ/ should not be inserted in between consonants.
***NASV-**	Vowels must not be nasal followed by any consonant except any nasal
***NC0-**	Nasal must not be followed by voiceless obstruent
***OBS VOI-**	Obstruent to remain Voiceless at Coda position
***OL-**	No Obstruent and a Liquid cluster
***OO-**	Obstruent must not be followed by another obstruent
***VORALN-**	Vowels must not be oral before a tautosyllabic nasal
***VV-**	No sequence of vowels
CON-	Constraints
CONT-	CONTIGUITY
DEP-	No Epenthesis
EVAL-	Evaluator
GEN-	Generator
IDENT-	Identical, no feature change

IO-	Input and Output
MAX-	No Deletion
NUC/V-	Vowel as Head of the Syllable
ONS/ *[σ V-	Syllables should have Onset.
OT-	Optimality Theory
PARSE-C-	A consonant must be parsed into a syllable.
VOP-	Obstruent in any position must be voiceless.

LIST OF SYMBOLS

/ /- phonemic transcription

[]- phonetic transcription

Ø- syllable

>>- ranks higher.

→- a process/results

☞- shows the optimal or winner candidate

↑- sound segment inserted.

↓- sound segment substituted or deleted.

*- violation

*! - fatal violation

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M Owais Ayub

DEDICATION

This work is dedicated to my parents and my brother who supported me throughout this journey. Your love, patience, and understanding have been my guiding light during both the challenging and triumphant moments of this endeavor.

CHAPTER 1

1. INTRODUCTION

Language is a fundamental aspect that distinguishes humans from all other creatures, enabling them to interact, exchange ideas, and express emotions. However, languages are not static; they undergo constant change over time, as linguistic experts affirm that change is inherent to all languages (Barry, 2002). Linguistic change is an inevitable phenomenon driven by various factors, with linguistic contact being a prominent one. Thomason (2001) states that contact situations give rise to linguistic changes that are less likely to happen in the absence of such interactions.

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). More than seven thousand languages are spoken worldwide, (“Ethnologue”, 2022), therefore, there is no denial that languages encounter each other and this interaction between languages facilitates the transfer of words from a donor language (L2) to a recipient language (L1).

Language contact consequently leads to lexical borrowing as revealed by Kachru (1986) that language contact results in the transfer of linguistic elements from one language to another. It is further explained by Winter (1992) that for lexical borrowing there should be a contact situation between two languages. Lexical borrowing is defined by Trudgill (1992), as the process whereby the speaker of one language introduces words to another language. It happens when the speakers of one language adopt or adapt words from the source language to their own native one. Trask (1996) suggests that lexical borrowing represents the most conventional method by which a language acquires new words.

The lexical items that enter a new language have been named loanwords (Crystal, 2008). It is necessary to differentiate between simple borrowing and loanwords.

According to Beardsmore (1986), borrowing is an umbrella term and loanwords are part of that umbrella term. Loanwords are single or compound words, but borrowing might be of stems or a whole phrase (Islam, 2012). Loanwords are the words that bilinguals often introduce in a language from a foreign language; nonetheless, they are then used by monolingual speakers of that language, often without their awareness of the source (Haspelmath, 2009). The term "loanwords" is often preferred over "borrowing" due to potential confusion in the literature. In certain studies, "borrowing" is employed to describe code-switching at the word level by bilinguals (Haugen, 1950), while in others, it serves as an umbrella term encompassing various types, such as loanwords, loan-shifts, and loan-blends (Beardsmore, 1986). However, some studies use "borrowing" and "loanwords" interchangeably, leading to further ambiguity (Smeaton, 1973). To avoid such confusion, it is better to maintain "borrowing" as the umbrella term.

Many studies in past and recent times have used the terms loanword and borrowed word as synonymous. According to Muysken (2016), ‘loanword’ and ‘borrowed word’ have been used as general terms for all types of transferring processes. But there exists a subtle difference between these two. A loanword is a term that is used for those lexical items that have been taken from one language and adjusted into the vocabulary or phonotactics of another language. Loanwords frequently undergo modifications to align with the phonological characteristics of the recipient language. For example, the English language has many loanwords from French, such as "restaurant," "entrepreneur," etc. These words are now integrated into the English language and are not generally recognized as French loanwords by English speakers. According to Cohen (2009) and Haspelmath and Tadmor (2009), a word qualifies to be a loanword only if it is acquired and altered phonologically to conform to the system of the recipient language. Once a loanword has been introduced into a language, it may undergo changes to its structure and pronunciation. In some cases, loanwords may become so integrated into a language that they are no longer considered to be foreign words.

A borrowed word, on the other hand, is a term used for those lexical items that have been taken from another language and used in their original form in the recipient language. Borrowed words retain their original form when entering a new language. The term ‘borrowed word’ is older than loanword as it was first used in 1875. However, in this study, the term "loanwords" is used to refer to the transferred lexical items that have

entered Khowar from English and adapted according to the phonological patterns of the language.

A loanword that has been borrowed originates from a second language, and through adaptation processes gets incorporated into the phonotactic of the first language of speakers (Cohen, 2009). These loanwords often fail to adhere to the phonotactic constraints of the borrowing language (Rose, 1999, p.1). Thus, when words are borrowed from a donor language (L2), they rarely remain the same and mostly undergo some changes. These modifications occur at the morphological, phonological, semantic, and syntactic levels. In simple terms, when a loanword enters a language, it undergoes structural changes. The loanword is required to agree to the phonological rules of the recipient language to be adjusted. Therefore, the language that receives the loanword configures it through different adaptation processes. This entire process involved in the integration is known as loanword adaptation. Loanword adaptation refers to the alteration of the phonological structure of foreign words in the recipient language. The main concern of this study is to analyze the phonological changes in the structure of English loanwords when they are adjusted into Khowar.

Khowar is a language that is spoken in the Chitral region which is the northern part of Pakistan (Liljegren & Khan, 2017). Khowar is also evolving with time as it has taken words from other languages, particularly from English. English and Khowar are two very different languages that show dissimilarities on syllabic, phonemic as well as structural levels. The lexical changes in the Khowar language show a noticeable influence of English on Khowar as there are plenty of English words that have entered the language in the past few years. Kachru defines the relationship between English and South Asian languages. In his analysis, Kachru (2006) characterizes English as a donor language and South Asian languages as recipient languages. He concludes that “English does not merely fill lexical gaps in these languages; rather, it introduces an extra lexical item that might already have a native equivalent” (p. 290). Therefore, in this study, English is dealt with as the “donor language” and Khowar as the “recipient language”.

The abundance of English loanwords in the Khowar language needs a detailed analysis, thus this study focuses on the phonological changes that happen when English words are adjusted into Khowar. There are certain strategies involved in the adaptation of a loanword. These strategies are known as adaptation or repair strategies because of their

transforming effects. Thus, a language chooses one or more repair strategies to adjust a loanword according to its phonotactics. The modifications in English loanwords as they enter Khowar have been examined through the lens of Optimality Theory (OT). The following section provides the background of this study.

1.1 Background of the Study

Pakistan is linguistically diverse as seventy-three different established languages are spoken in the country (Simons & Charles, 2018). English has a greater impact on the indigenous languages of Pakistan and according to Rehman (2004), Urdu is used as lingua franca across the country, but English is used in higher, more privileged, and elite institutions like military and bureaucracy, etc.

Khowar is one of the indigenous languages of Pakistan. It is an Indo-Aryan language and apart from Chitral, it is spoken in some parts of Gilgit Baltistan like Ghizer, Yasin, Phandar, and some parts of Tajikistan and Afghanistan as well (Khan, Buriro & Bakhsh, 2021). Sloan (1981) explains that Khowar is fundamentally a combination of two distinct words: "Kho," referring to the natives of Chitral, and "war," denoting language. Consequently, Khowar signifies the language of the Kho people. Although Khowar is the main language of Chitral, apart from Khowar fourteen other indigenous languages are also spoken in the region (Bashir, 2001). However, Khowar is a dominant language in Chitral and is spoken by approximately 351,000 native speakers (“Ethnologue”, 2018).

The phenomenon of language contact and the impact of more dominant languages on others is widespread. Khowar is less dominant to the languages like Persian, Pashto, and Urdu. Until 1972, when Chitral existed as an independent state, Persian served as its official language. Consequently, Persian words are evident in Khowar literature. Similarly, Khowar serves as the primary means of communication in the northern regions, while Pashto fulfills this role in the southern areas (Liljegren, 2016). Therefore, these languages have highly influenced Khowar with time as Khowar has taken numerous words from them. But recently it has taken many words from English. Katamba (2005) highlights the social factors as the main reason for lexical borrowing. According to him, because of the high social status associated with a particular language, other subordinate languages attempt to borrow words from it. Thus, during lexical borrowing, a recipient language, typically less dominant, borrows morphemes, words, and phrases from a donor or more dominant language (Van Hout & Muysken, 1994)

Crystal (2003) comments on English as a borrower language itself as it has borrowed words from other languages, especially from French, but it is a fact that English today is considered a donor language. It is a key source of lending words to other languages of the world. Likewise, Khowar has acquired many words from English. The impact of English on Khowar dates to the late 19th century; however, it has gained momentum in the last few decades, due to globalization, new technologies (the Internet, social media), as well as pop-culture (videos, films, music), etc. Khowar is experiencing a rapid transformation in its vocabulary. Old words representing specific things or activities are continuously evolving over time and adding new words, taken from other languages to its repository. Khowar is observed to have extensively taken words from English, that are integrated into its vocabulary to such an extent that hardly any phrase or sentence in Khowar ends without one noticing a loanword being used.

Kenstowicz (2003) points out that once words are borrowed, they go through the process of adaptation at the phonological level according to the phonology of the host language. This process is known as phonological adaptation. According to LaCharité and Paradis (2005), the recipient language phonologically adjusts the loanwords using a variety of adaptation techniques. Therefore, when loanwords enter a new language, they typically undergo alterations in their structure to align with the phonotactic patterns of the recipient language (Kager, 1999).

Hence, the primary focus of this research study is to find out the English loanwords and examine the phonological changes in the structure of these loanwords after their adjustment into Khowar. This phonological analysis of English loanwords seeks to establish the integration of loanwords with regards to Khowar phonology. The loanwords must be subjected to repair options in order to match the phonotactics of the recipient language therefore the study describes the processes involved in the adaptation of these loanwords and examines the phonotactic constraints of Khowar.

1.2. Statement of Problem

Khowar is subjected to the phenomenon of linguistic change. Many languages have influenced Khowar in the past, like Persian, Pashto, and Shina, but the impact of English on Khowar is increasing as it has taken numerous words from English. There exist typological differences between these two languages. As such the English loanwords have structures that do not often conform to the phonotactic constraints of Khowar. Therefore,

a detailed study is needed to investigate how Khowar adjusts the illicit structure of the English loanwords according to its phonotactics and the potential treatments that English loanwords encounter upon entering Khowar. Therefore, the present study aims to examine the adjustment of English loanwords into Khowar. While research studies have addressed and explored the adaptation of English loanwords in different languages of Pakistan, it is yet to be studied within the context of Khowar. Consequently, it also aims to contribute to the research studies on Khowar and its phonotactic constraints.

1.3. Research Objectives

1. To find out the loanwords that have been taken from English into Khowar.
2. To identify the processes that are used to adjust English loanwords in Khowar.
3. To identify the phonotactic restrictions present in Khowar.

1.4. Research Questions

1. What are the loanwords that Khowar has taken from English?
2. What phonological processes are involved in the adaptation of English loanwords in Khowar?
3. How do the phonotactic constraints in Khowar influence the adaptation of English loanwords?

1.5. Significance of the Study

In regions with diverse cultures and languages, language contact is unavoidable, leading to the borrowing of words from one language to another. Chitral, being a multilingual area, features a variety of minor and major languages alongside Khowar. The influence of English on Khowar has been steadily increasing, with speakers incorporating English loanwords into their daily interactions. Despite this, the amount of research on lexical borrowing in Khowar has been quite limited, as revealed by the researcher's review of previous studies. Therefore, this current research study holds significant importance as it addresses the scarcity of literature on this topic.

Likewise, it is significant because it is a substantial contribution to research on Khowar in particular and Pakistani languages in general. It aims to contribute valuable insights into Khowar's phonological system. Furthermore, it also contributes to the typological differences exist between the two languages.

The researcher, being a native speaker of Khowar, is confident that this research study will pave the path for future researchers who want to do research studies on the Khowar language.

1.6. Delimitation

When languages are encountered, they influence each other, and as a result, exchange of words occurs. The words that are taken from the donor language (L2) into the recipient language (L1) show differences on many levels, like phonological level, morphological level, syntactic and semantic levels. This present study is delimited to only phonological changes in the structure of English loanwords when adjusted into Khowar.

Though there are many types of lexical borrowing, for example, loan-blend, loan-shift, and loan- translation (calque), this research study is delimited to only one type of lexical borrowing, which is a loanword. The researcher was well aware of the fact that Khowar lacks any calque loans and loan blends, which served as motivation for the researcher to begin collecting loanwords only. Although a significant number of loanwords have been taken from other languages into Khowar, this study is restricted to the loanwords taken from English.

Moreover, it is delimited specifically to the Khowar speakers of the Chitral region, that is the birthplace of the language. The researcher opted to involve male speakers of Khowar for participant observation due to the male-dominated nature of Chitral. It was challenging to include females for observation therefore they are excluded from this research study.

1.7. Structure of the Study

To proceed with the study systematically a provisional plan is outlined as follows:

The study comprises five chapters. Chapter 1 includes 'Introduction’. It encompasses the background of the study, problem statement, research objectives and research questions, significance of the study, and delimitation of the research.

Literature Review is discussed in Chapter 2. Some major works related to the topic are reviewed. This leads to the identification of gaps in previous research which are highlighted towards the end of the chapter.

Similarly, Chapter 3 encompasses the Research Methodology section, where the research design, data collection methods and sampling technique are elaborated. This chapter details the strategies and instruments employed for gathering and interpreting data. Furthermore, the theoretical framework is discussed in detail in this chapter.

Chapter 4 of this research study involves ‘Data Analysis’. It offers an in-depth examination of all the gathered data, providing comprehensive analysis of the adjustment of English loanwords into Khowar. Furthermore, the findings of the study are also discussed in this chapter.

Finally, Chapter 5 concludes the study by referring back to research questions. Additionally, this chapter suggests potential directions for future research.

CHAPTER 2

2. LITERATURE REVIEW

The primary role of a literature review is to assist researchers by providing a contextual background of relevant research studies conducted earlier. According to Harlen (1998), a literature review is a mandatory part of the research process. The present study aims to unveil the English loanwords in the Khowar language and their phonological adjustment. Thus, this chapter will go into detail and bring to the discussion the following broad areas: Khowar language, phonemic inventory of Khowar, English as donor language, lexical borrowing, phonology, syllable, syllable structure, and adaptation strategies. This chapter will also explain a detailed review of previously conducted studies that are relevant to this research study.

2.1 Khowar Language

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. Chitral is characterized by its stunning landscapes, featuring mighty rivers and vast mountains that act as natural barriers, thus serving as isoglosses separating linguistic varieties. Chitral holds the distinction of being the largest district in Khyber Pakhtunkhwa, covering a vast area of approximately 14,850 km² (“Local Government, Elections and Rural Development Department”, 2019). According to the “Pakistan Bureau of Statistics” (2017) census report, the total population of Chitral is approximately half a million with 49.6 females and 50.4 males with the prevalent language Khowar.

Khowar is the native language of the inhabitants of the Chitral district. 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). Interestingly, Khowar goes by several other names too. For instance, the Shina speakers refer to it as "Arniya," while the Pashtuns residing in the lower part of Chitral call it "Qashqar," denoting both the place and the language as

"Qashqari." In the Bumburet Valley of Chitral, the ethnic group known as Kalasha identifies the language as "Patu." Additionally, non-local people in the area recognize both the inhabitants and their language as Chitrali (Decker, 1992).

Besides being spoken in Chitral, as mentioned by Khan et al. (2021), Khowar is also used in the Ghizer and Yasin valleys of Gilgit Baltistan, Swat, Tajikistan, and Afghanistan. According to Rehman (2010), Khowar is the second most spoken language in the district of Khyber Pakhtunkhwa and the third most spoken language in Gilgit Baltistan. It belongs to the Dardic group of the Indo-Aryan language. Notably, in the Swat valley, Decker (1992) points out the presence of people of "Kho" ethnicity, but they no longer speak the Khowar language.

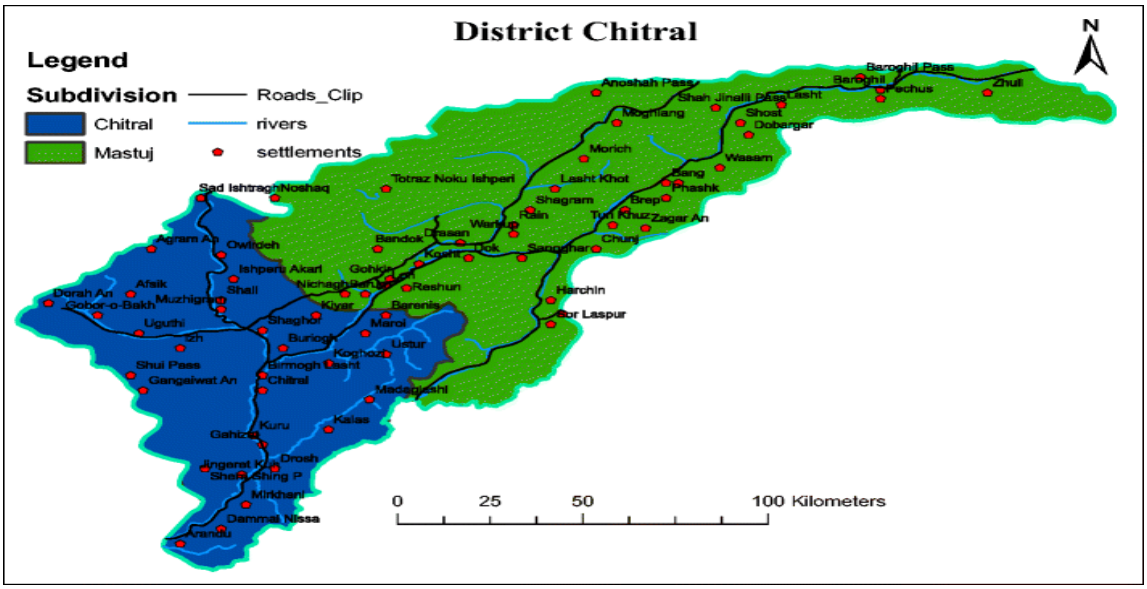

Figure 1: Map of District Chitral retrieved from https://www.researchgate.net/figure/Site-map-of-district-Chitral-

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.

Moreover, Chitral is a multilingual region of Pakistan and lexical borrowing is a common feature of multilingual societies. Alongside Khowar, Chitral is home to fourteen

minor languages. In many villages of Chitral, Khowar is the language of the minority. These facts make it crystal clear that Chitral is not a monolingual geographical area, rather it is multilingual. People belonging to different ethnicities, whose native tongue is not Khowar use it as lingua franca in the region.

2.1.1 History of Khowar Language

Khowar serves as the language of the Chitrali people, and Morgenstierne (1932) posits that it has been spoken in the region for a significant period. Its expansion over the region may be seen, notably from the northern part, especially from Torkhow. He further suggests that these Khow people entered the region through the Boroghil pass and occupied lands in Wakhan Valley. Thus, Torkhow (a place in Upper Chitral) is considered the birthplace of Khowar language. Numerous researchers and anthropologists concur that Khowar speakers migrated to this region during the Aryan conquest of South Asia. The settlement of Kho speakers in Ghizer Valley dates back to ancient times, their true ancestral home was Mastuj, a location situated in Upper Chitral (Morgenstierne, 1932).

Figure 2:Picture of Chitral Fort

Initially, Khowar did not receive rapid recognition in the southern part of Chitral, which was dominated by the Kalasha tribe. The Kalasha people had their vernacular language, but in the 13th century, their dominance in the area began to decline, and they were pushed back by the Kho tribe (Sloan, 1981). The Kho tribe, specifically the Raees, emerged as the first rulers of the region and expanded their territory to Ghizer and Yasin. However, the Raees' rule was eventually overthrown by another Kho tribe known as the

"Katurs." The Katurs governed the region from 1571 to 1969 when the state of Chitral merged with the then NWFP (Khyber Pakhtunkhwa). During the Katurs' reign, Khowar gained popularity and spread to the southern part of the region.

The major setback for the progress of Khowar was that it remained an unwritten language until recent times. Many researchers, especially Sloan, have pointed out the reason for Khowar not progressing as a written language. According to him, Roman alphabets are more suitable for writing Khowar, but due to religious connection Arabic, Urdu, and Persian alphabets are used when writing Khowar. Consequently, Khowar has not met much success and it is still primarily an unwritten language (Sloan, 2006).

Different English scholars during the British Empire came to Chitral and used the English transcription system to write Khowar words. Persian alphabet was used for writing Khowar since 1917 by scholars like Nasir ul Mulk, Hisham ul Mulk, and Mirza Ghufran. Somewhere in the 1950's Shahzada Samsam ul Mulk wrote the grammar of Khowar language and the Khowar alphabets were also adapted. Nowadays many organizations and literary societies are working for the preservation of the Khowar language. "Anjuman e Taraqiye Khowar" is one of the leading societies. This is how Khowar emerged with time.

2.1.2 Earlier Contact of English and Khowar

From 1892 to 1947, the English ruled over Chitral after receiving an invitation from the ruler known as Mehtar, seeking protection from the Afghans around the time when the renowned Durand treaty was finalized. In close proximity to Chitral, there resided a tribe called "Bashgal" or Red Kafirs, who were believed to be descendants of the Quraish Tribe and had resisted converting to Islam during the time of Muhammad (PBUH) when Islam was spreading in Arabia. They eventually settled in the mountainous regions of Hindukush. The Bashgalis held extreme views, defining manhood by the number of Muslims one had killed. This prompted Mehtar Aman ul Mulk to request the inclusion of Chitral on the British side of the Durand Line, established in 1893, as a measure to safeguard his territory (Sloan, 2006). In this way, English and Khowar came in direct contact, and with each passing day, Khowar started borrowing lexical items from English.

2.1.3 Phonemic Inventory of Khowar Language

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. The consonants of Khowar are given in table 1*:*

Table 1
Consonant Inventory of Khowar

	Bilabial	Dental/alveolar	Postalveolar (apical)	Postalveolar (laminal)	Velar	Uvular	Glottal
Plosive	p b p^h	t d t^h	ʈ ɖ $ʈ^h$		k g k^h	q	
Nasal	m	n			ŋ		
Affricate		t͡s d͡z t͡s^h	ʈ͡ʂ ɖ͡ʐ ʈ͡ʂ^h	t͡ɕ d͡ʑ t͡ɕ^h			
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)

Similarly, Khowar has five contrastive vowels (Liljegren & Khan, 2017). Vowel sounds are produced without any obstruction in the vocal cords as the air flows freely through them and out through the lips. *Table 2* shows the vowels of Khowar language.

Table 2
Vowels in Khowar

	Unrounded Front	Unrounded Central	Rounded Back
High	i		ʊ
Mid	ɛ		ɔ
Low		ɑ	

2.1.4 Khowar Consonant

The total number of consonants in Khowar is 41. According to Liljegren and Khan (2017), there are seven places of articulation. Among the consonant phonemes of Khowar, there are oral as well as nasal stops, plosives, affricate, fricatives, tap, approximant, and lateral approximant. Plosives are those sounds that are produced with a complete blockage of an airstream and after the blockage, there is an abrupt release. Sloan (2006) and Bashir (2003) have distributed the oral and nasal stops as; /p/, /pʰ/, /b/, /ʈ/, /ʈʰ/, /ɖ/, /ʈ/, /ʈʰ/, /ɖ/, /k/, /kʰ/, /g/, /q/ as oral stops while /m/, /n/ as nasal stop. Fricatives are those consonantal sounds that are produced with air flowing throw a narrow passage making a hissing sound (Roach, 2009). Like most of the fricatives in other languages, the fricatives of Khowar are continuant. It means that they can be produced without any interruption like in the case of plosives. Khowar fricatives are /f/, /s/, /z/, /ʃ/, /ʒ/, /ʂ/, /ʐ/, /x/, /ɣ/, /h/. Like English and other languages, we can find affricates in Khowar. Affricates are those sounds that are produced with a brief stoppage of an airstream, and an abrupt release causing friction (Yule, 2010).

According to Roach (2009), there are only two affricates in English and they are /ʧ/ and /dʒ/, and in church /tʃʒ:tʃ/ and judge /dʒʌdʒ/. But in addition to these two affricates, there are seven other affricates in Khowar. They are /ts/, /tsʰ//tʃʰ/, /dʒ/, /ʧ/, /ʧʰ/, /ɖʐ/. There are two approximants in Khowar, /ʊ/ /j/ and a lateral approximant /l/ and it has a trill consonantal phoneme /r/. The nasal sounds in Khowar are /m/ /n/ and /ŋ/. It should be noted that t͡ʂ t͡ʂʰ d͡ʐ kʰ etc., are independent phonemes of Khowar and these are not a combination of two letters. Some of the sounds are so difficult for non-native Khowar speakers that they cannot pronounce them correctly even after spending years in Chitral.

2.1.5 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 in Khowar 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), /pɔ̃n/ 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. This process is known as assimilation.

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 3

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	ɬɔ	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 4

Long Vowels in Khowar

Long Vowels	Usage in Khowar	Gloss
iː	hiːm	snow
eː	kɑfeːɾ	Infidel
aː	maːɬ	nest
ɔː	gɔː ɾ	sorceress
uː	uːx	water

Moreover, stress on these vowels act contrastively e.g., bɛ́ɬu (basket) and bɛɬú (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).

2.2 English as Donor Language

For many decades, the English language has enjoyed widespread acceptance as a world language (Crystal, 1997). Numerous distinguished scholars and creative minds have employed diverse labels and terms to illustrate and elucidate the distinctive position of the English language in the world. These designations include World Englishes, English as an international language, English as a global language, and English as a lingua franca, all serving to portray the exceptional significance and influence of English worldwide (Crystal, 1997; Jenkins, 2000). In addition to borrowing, the pervasive influence of English over all other languages has led to the emergence of several other issues, including the challenges of maintaining, preserving, and potentially losing specific domains of native languages. According to Durkin (2014), during the Norman conquest, English borrowed lots of words from French, but later on in the 19th and 20th centuries, other languages started borrowing words from English. 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 is seen as a major donor language as England ruled a significant portion of the world through colonialism (Crystal, 1997). English started lending words to other languages and this process reached its peak during the industrial revolution. In the 20th century, English attained the status of power in the USA and took control of the economy as well as other fields of life. According to Dollerup (1996) after World War II, when Americans began doing all of their business in English, it became the universal language or lingua franca. After becoming an official language all around the world, English has grown in prominence. An international body has recognized it as a universal official language (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 conclusion, English has earned a top position after achieving success in the fields of commerce, music, radio, journalism, education, and communication, and its supremacy is acknowledged on a global scale. English's growth as a language led to widespread borrowing at all linguistic levels.

2.2.1 Impact of English in Pakistani Context

The English language has gained supremacy and penetrated practically every aspect of society, including popular entertainment and music, sports, fashion, commerce, marketing, and business. When it comes to languages, English dominates in Pakistan, so much so that the national language of Pakistan “Urdu” comes in second position and then regional languages are listed after in terms of popularity and usage. The status of regional languages has been greatly impacted by the fact that English has become a route to obtaining respect and decent jobs. It is true that the regional languages of Pakistan have not received the same respect and educational importance as the English language (Siddique, 2011). The supremacy of the English language has completely altered the situation. People do not feel comfortable being tied to regional languages in a scenario where all status is associated with the English language.

Without proficiency in the English language, it is impossible to obtain a decent job in Pakistan (Rahman, 2002). While regional languages are now considered to be the language of the lower middle or lower sections of society, English has become the language of the higher class. Finding a quality job requires passing a competitive exam, which is all given in English. English has also made a significant impact on Pakistani languages, with numerous English loanwords integrated into them through lexical borrowing. These loanwords are frequently used nowadays, and it is hard to say that there can be a language in Pakistan that does not use any word of English.

2.2.2 Language Contact and Linguistic Change

One of the most organized means of preserving human history, culture, values, and standards is language. All currently spoken languages are not stagnant and uniform but dynamic and diverse. Every aspect of the universe is constantly changing, as seen and discussed by philosophers, theorists, and poets throughout history as it is said by the Greek philosopher Heraclitus, “Everything rolls on, nothing stays still” (Aitcheson, 2001, p. 3). Likewise, the languages of the world also change. Aitcheson (2001) suggests that in a world where everything changes, from people aging to tadpoles transforming into frogs and milk turning into cheese, it would be peculiar if language alone remained unaltered. Previously, linguists have always opposed language change and see it as a sign of the language's decline. The grammarians of the eighteenth century said that the old meanings and forms are valid, and the new ones are incorrect (Palmer, 1976). However, as time goes on, we might observe more significant changes in languages, particularly in English. Modern linguists now hold that linguistic change is an intrinsic quality of a language. Finding a remote community today with a language that has never interacted with another language is quite challenging. Thus, it is difficult to prevent a language from the influences of other languages it interacts with.

Languages of the world encounter each other and as a result of the influence of other languages, a language undergoes gradual internal and external changes over time. In the present day, it is increasingly challenging to find a language or dialect that exists in complete isolation without having experienced any linguistic influence from other languages. Languages are in fact permeable, absorbing the traits of any other languages they may come into touch with, much like cultures do.

According to Sapir (1921), the simplest type of influence that any language may have on another language is thought to be the borrowing of lexical items. When a word or phrase is taken from another language, its semantic, phonetic, morphological, and syntactic properties must always be modified because the new sounds, meanings, and syntax may not suit the native language's phonotactic constraints. Thus, language contact with other languages frequently results in changes in its structure. The simplest manifestation of this impact is the borrowing of words from other languages. The borrowing of words happens through a process known as lexical borrowing.

2.3 Lexical Borrowing

New words enter the vocabulary of a language and these words in a language are formed in two ways, by alteration of existing words and secondly creation of a completely new word. When new words enter a language, they are very quickly adapted. One of the main sources of new word formation in a language is lexical borrowing. According to Kachru (2006), borrowing involves the adoption of lexical items from one language to another with the purpose of filling lexical gaps. One major cause of language change is linguistic borrowing (Cowely & Bowern, 2010).

It is assumed that the most common process of the evolution of language is lexical borrowing. It is a unique as well as peculiar process and it cannot be compared with other procedures of language change. It heavily depends on the language contact situation. Lexical borrowing takes place when a word in language ‘A’ does not exist in language ‘B’ (Gustara, 2015). 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). Languages all over the world acquire lexical items from neighboring languages, the ones they encounter. The most clearly detectable outcome of intercultural interaction is the set of loanwords. Therefore, lexical borrowing is considered as the mixture of non-native linguistic units in the native language. It happens in three distinct ways, borrowing with very minute change, loan translation and finally mixing a foreign language with a native one (Sipra, 2013).

Lexical borrowing is not a straightforward process. Certain factors lead a language to borrow words from other languages. One main factor of lexical borrowing is the social factor. A dominant language most of the time acts as a donor. Due to the social prestige of a language other subservient languages try to borrow words from that language. Lexical

borrowing is a phenomenon in which a recipient language, typically less dominant, borrows morphemes, words, and phrases from a donor or dominant language (Van Hout & Muysken, 1994; Katamba, 2005).

The phenomenon of borrowing has been the focus of many scholars and linguists. According to Haspelmath (2009), borrowing refers to the integration of non-native linguistic units into speakers' native language. Borrowed words are also called loanwords and according to Liberman (2009), these loanwords are the source of language development.

2.3.1 Types of Lexical Borrowing

Lexical borrowing is simply the adoption of different words or even larger vocabulary items from other languages (Doulton, 2012). Some researchers call the process of lexical borrowing the reproduction of a particular language into a new language. According to Hockett (1958), there are different types of lexical borrowing.

a. Loanword

When languages come in contact exchange of vocabulary items happens. The new word that enters a language is called a loanword.

b. Loan Translation

A very special and unique kind of borrowing is loan translation, it is often called calque. Loan translation is a word-for-word translation or direct translation of words in the recipient language. According to Durkin (2014), loan translation is the structural duplication of words or phrases into the target language.

c. Loan Blend

A loan blend is also a unique type of lexical borrowing where there is a blending of words from source and recipient languages. In this type of lexical borrowing, one element is that of the source language and the other element is that of the recipient language.

2.3.2 Factors and Impacts of Lexical Borrowing

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. Everybody now adopts a modern way of life

by using foreign words (Katamba 2005). Radford et al. (2009) have observed that the primary reason for the adoption of foreign words is cultural dominance. People adopt the language and way of life of the dominant group because they consider it to be more prestigious than their own way of life. The use of French in Old English during the Anglo-Norman period (1100-1500) serves as an illustration to assist in explaining the aforementioned point. Due to French dominance over England, numerous words were borrowed from them. According to Katamba (2005), another justification for borrowing is the usage of foreign phrases to make some words seem less awkward since doing so makes them sound less awkward.

Regarding the linguistic integration of loanwords, many linguists have diverse perspectives. Borrowed words stay the same in the recipient language as they do in the source language (Katamba, 2005). When native language speakers attempt to adapt a loanword, Romaine (2017) has shown that changes take place. According to Weinreich (1953), the nature of loanwords is flexible, causing their meaning and form to alter depending on the circumstance.

2.3.3 Function and Use of Loanwords

Loanwords are words that the recipient language does not return (Crystal, 2003). Pavol (2005) defines loanwords as new lexical items that are modified to fit the receiving language. Hudson (1996) introduces the idea of the symbolic value of language. He contends that speakers of one language use loanwords because their native language does not have an equivalent phrase or word and because of the "unique symbolic significance" that the donor language possesses. One such example is the widespread use of English loanwords in the domains of technology, business, education, and science across the world (Tatsioka, 2010). When speakers of the recipient language find the donor language appealing, they tend to incorporate loanwords in their speech as they perceive it to be prestigious to do so. Many cultures like borrowing English words since it is seen as a sign of strength and prestige.

In his study titled “Language Borrowing and language diffusion: An Overview”, Hoffer documents his thorough research on language borrowing. According to Hoffer (2002), loanwords fulfill various functions beyond the typical exchange of words and ideas. However, a loanword's primary function is to describe a new idea, activity, or item that has entered a culture. When loanwords enter a language, they have the potential to

become part of its standard lexicon. Hoffer suggests that it usually takes around twenty to twenty-five years of consistent usage before a word is officially included in a major dictionary Additionally, loanwords might be used to portray the speaker as modern, stylish, or creative. Classes of society who want to stay up with modernism prefer to get familiar with the use of such words (Hoffer, 2002).

Loanwords can also be used for literary, lyrical, or wordplay purposes. Ahmad and Ali (2014), in their article entitled “Impact of Urduised English on Pakistani English Fiction” note that this may frequently be observed in the literature written in English by Pakistani authors. According to them, “these words not only bridge lexical gaps but also hold significant cultural roots within Pakistan. Their usage represents a distinctive characteristic of Pakistani English” (p. 6).

2.4 Phonology

The study of human speech sound is called phonology. While phonetics deals with the physical articulation of speech sounds, phonology deals with the mental or abstract characteristics of speech sounds. Yule (2010) explains that phonology pertains to the patterns of sound types, encompassing the various physical articulations of those sounds. It primarily centers on phonemes, which are the sounds that differentiate meanings. The phonemes act in a contrastive manner, for example when we substitute one sound for another, and a change in meaning occurs then the two sounds represent two different phonemes. When a word enters a language through borrowing it either accepts the grammatical rule of the recipient language or violates it. The study of a language's sound system is known as phonology, while Odden (2005) describes it as “the examination of a language's sound structure” (p. 2).

2.4.1 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. Adoption is the borrowing of a word from a donor or target language, but the loanword will maintain its original shape with no changes. It is the same as copy/paste of a word from a donor language to a recipient language. These types of borrowed words are sometimes called “foreignisms”. In opposition to this,

adaptation is a process whereby borrowed words undergo certain phonological changes. Thus, phonological adaptation refers to the restructuring phonology of loanwords based on the phonotactics of the recipient language.

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. The processes may include substitution, deletion, epenthesis, shortening and widening of vowels, etc. 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).

2.4.2 Views on Lexical Borrowing and Adaptation of Loanwords

Languages of the world regularly borrow or interchange linguistic items with one another (Campbell, 2004). According to Yalwa (1992), without having contact with other groups nearby, no human group or society can survive. Through this interaction, groups or communities affect each other on many different levels - linguistic, social, cultural, etc. When different communities come in contact, typically, languages also come into touch. One of the most important effects of this linguistic contact is lexical borrowing. According to Haspelmath (2009), when two languages come into contact, lexical borrowing occurs. A language loans a word or a lexical item from its lexicon to the other. Lexical borrowing describes the interchange of words between two languages (Capuz, 1997). The borrowed word is owned by the receiving language, which may, at any time, customize it using different adaption strategies.

Loanword adaptation refers to the segmental and prosodic changes made to a word in the borrowed language (Haspelmath, 2009). According to Mwaniki (2013), the relative differences between the phonological structures of natural languages are a major driver of loanword adaptation. The literature on loanword phonology includes terms such as "loanword adaptation and adoption" and "importation," among others. Loanword adaptation refers to the recipient language altering the phonetic structure of foreign words. For instance, in Punjabi, the word "call" (/kɔ:l/) undergoes conversion to /ka:l/ (Hussain et al., 2011). Differences exist between "importation" and" loanword adjustment," where "importation" involves incorporating words without altering their phonetics and

phonology, while "loanword adjustment" entails merging words with modifications to their phonetic and phonological aspects. Importation is frequently observed among bilinguals, and the higher the degree of bilingualism within a community, the greater the likelihood of importation occurring in a language. But loanwords are often nativized by monolinguals as opposed to bilinguals (Friesner, 2009). On the other hand, "adoption" describes the assimilation of loanwords while maintaining the original pronunciation of the input form (Holden, 1976).

Hudson (1996) explains that borrowing serves as a mechanism, linking two distinct languages, wherein words are assimilated from one language to another. When we engage in borrowing, the lexical item retrieved in this process is referred to as a loanword. According to Mojela (1991), a loanword is a word that has been integrated into the borrowing language's linguistic structure in such a way that it has become an integral part of that language. Tadmor (2009) claims that a word may only be considered a loanword if it has been copied from another language and has phonologically been transformed to fit the borrowed language's phonological system. Cohen (2009) divides loanwords into two categories: the compliant/nativized and the non-compliant. According to him, compliant loanwords are those that seamlessly fit into the recipient language, without any changes while non-compliant loanwords completely or partially alter their structures to fit the borrowing language systems. These loanwords are considered foreign therefore languages would need to repair or adjust these words in some way to ensure that they comply with the necessities of the acquiring language (Kang, 2010).

Matiki (2016) argues that usually nouns are more frequently borrowed than all other lexical items. Nevertheless, this does not imply that only nouns are borrowed. According to linguists, other parts of speech are also borrowed (Haugen, 1950; Poplack, Sankoff, & Miller, 1988). Certain adaptation processes are applied by a borrowing language to adjust a loanword. These include epenthesis, substitution, deletion, etc.

2.5 Syllable

Syllables received virtually little attention among phonologists in the 1960s and the early 1970s, except for Fudge (1969). In the work of Noam Chomsky on phonology, SPE (The Sound Pattern of English) in 1968, it was denied that syllables were separate phonological components. Vennemann's work in 1972 was instrumental in recognizing the syllable as a significant unit in phonology, marking a pivotal moment in the field.

Since then, there has been an increased interest in the theory of the syllable (Rakhieh, 2009). Evidence for the syllable's significance in phonological generalization (Vennemann, 1972; Blevins, 1995) is threefold. First, the phonotactic patterns of a language can only be identified with reference to the syllable. According to Kahn (1976), the hypothetical English word “atktin” is impossible, because it is not acceptable to use the sequences “tk” and “kt” at the beginning or end of an English word. They do, however, show up in word middle position like Atkins.

Second, many phonological principles, such as those governing vowel lengthening, nasalization, or assimilation in general require direct reference to the syllable. For example, according to Broselow (1979), the simplest way to explain pharyngealization in Cairene Arabic is to make use of the syllable. Finally, the syllable serves as the arena for suprasegmental phenomena like stress and tone. Syllables are a stress-bearing unit. Rakhieh (2009) distinguishes two categories of syllables based on their weight: heavy syllables (CVC, CVV) and light syllables (CV).

2.5.1 Syllable Typology

“Languages generally allow consonant-initial syllables, which are obligatory in some languages but optional in others” (Blevins, 1995, p. 230). On the contrary, consonants at the end of syllables are permitted in certain languages and prohibited in others. Nuclei, however, are required, while onsets and codas are considered optional. In various languages worldwide, complex margins are permissible, leading to an increased variety of syllable types. In Zec's (2007) analysis of syllable structure, she provides a table illustrating the typology of syllable forms, including those with complex onsets and/or complex codas.

Onset	Coda	Onset Cluster	Coda Cluster	Inventory	Language
R	O	O	O	(C) C V (C) (C)	Totonak
			X	(C) C V (C)	Dakota
		X	O	C V (C) (C)	Klamath
			X	C V (C)	Temiar
R	X	O	-	(C) C V	Arabela
		X	-	C V	Senufo
O	O	O	O	(C) (C) V (C) (C)	English
			X	(C) (C) V (C)	Spanish
		X	O	(C) V (C) (C)	Finnish
			X	(C) V (C)	Turkish
O	X	O	-	(C) (C) V	Pirahã
		X	X	(C) V	Fijian

R= required, O= optional, X= banned

Figure 3: Syllable Typology given by Zec (2007)

The languages listed in the table allow onsets either by requiring them or by not prohibiting them. However, in these languages, codas are either optional or prohibited.

Additionally, cross-linguistically, complex onset and complex codas act similarly; they are not mandatory in a language's grammar but may or may not be allowed. McCarthy and Prince (1986) contend that there is no restriction on the number of complex margins as long as the language permits them.

2.5.2 Syllable Structure

A syllable is defined as a "natural unit of spoken language by which sounds are organized in speech" (Easterday, 2019, p.3). The syllable holds a central role in the phonological structure of any language. It is defined as "a unit containing a vowel or vowel-like sound, and the most prevalent type of syllable usually consists of a consonant preceding a vowel" (Yule, 2010, p. 45). The basic element of the syllable includes an onset, an obligatory nucleus, and a coda as is given in the figure below.

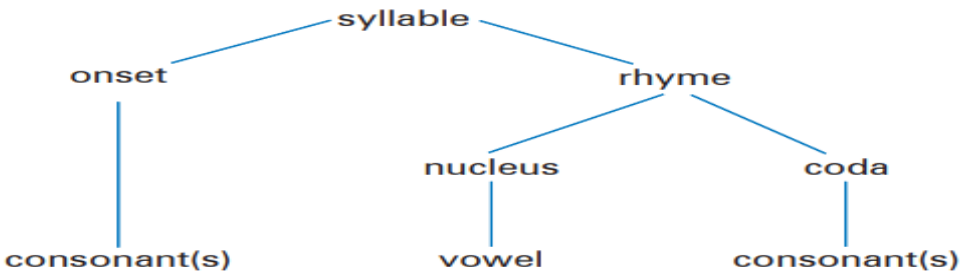

Figure 4: Elements of Syllable (Yule, 2010)

The onset and coda contain one or more consonants, while the nucleus always contains a vowel. A vowel always fills the nucleus of a syllable. These vowels at the nucleus are more sonorous than all the other sounds. In English, aside from vowels, syllabic liquids and nasals are also allowed to occupy the nucleus position in a syllable.

Some syllables are opened or closed. Open syllables are those that do not have a coda. Therefore, syllables like he, /hiː/, /wiː/we, and/triː/ tree are open because there is no consonant at the coda position. On the other hand, the syllables in /kæt/ cat, and /bæt/ bat, etc are closed syllables because there is an onset (consonant at the initial position), a nucleus (vowel), and a coda (consonant at final position). The /t/ phoneme has closed all the above-mentioned syllables.

More than one consonant can be found in the onset as well as the coda position. Such a combination of consonants is called a consonant cluster. For example, brick is a monosyllabic word that contains a consonant cluster at the onset position /brɪk/ thus the syllable structure will be (CCVC). A consonant cluster can happen in the coda position as

well e.g., the host is also a monosyllabic word that contains a consonant cluster at the final (coda) position /həʊst/. The syllable structure can be represented as (CVCC). In numerous languages, including English, the onset position typically allows a maximum of three consonants, while the coda position permits a maximum of four consonants. When a syllable begins with a vowel and there is no consonant at onset it is called zero onset e.g., is /ɪz/, it /ɪt/ etc are syllables with zero onset. Similarly, when there is no consonant at the coda position, it is called a zero coda e.g., to /tʊ/. According to Roach (2009) in English, any consonant can be placed at the coda position except /h/, /w/, /j/.

It should be noted that a single vowel in isolation is considered a minimum syllable (Roach, 2009). For example, in words like, are/ɑː(r)/, or/ɔː(r)/, err/ɜː(r)/, /r/ is silent therefore the single long vowels / ɑː/, /ɔː/ and /ɜː/ in each word is considered as a syllable. In addition to that the /m/ in 'hmm' and / ʃ/ in 'shh' must be regarded as syllables. One very ubiquitous pattern of syllable structure that is in almost every language is CV, a consonant followed by a vowel. It is also called a universal syllable type or canonical structure (Easterday, 2019). According to Clements and Keyser (1983), in cases where a consonant is positioned between vowels (VCV), it is syllabified as /V.CV/ across languages, rather than /VC. V/. Generally, languages allow consonant(s) at the onset and the final position (coda). But some languages prohibit one of these. However, onset and coda are optional while the nucleus is an obligatory part of any language.

2.6 Adaptation Strategies

When words are taken from an alien language, they undergo modifications referred to as loanword adaptations. This process transforms ill-formed words from the source language into well-formed words in the borrowing language (Peperkamp & Dupoux, 2003). According to Peperkamp (2003), the so-called repairs entail common phonological operations such as segmental and suprasegmental alterations, epenthesis, and deletion. In most situations, ill-formed segments are kept and modified. Loanwords when entering a language (L1), have structures that are ill-formed from the perspective of the borrowing language. According to Paradis and LaCharité (1997), such structures are repaired minimally. The adaptation strategies often include epenthesis, substitution, deletion, circumfixation, vowel and consonant hardening and softening, etc.

I. Epenthesis

Epenthesis refers to the addition of one or more sound segment(s) to a word (Odden, 2005). Either a vowel or a consonant sound segment can be added. Insertion of a segment can happen at the beginning of a word or in the middle.

II. Substitution

According to Anyanwu (2008), substitution is the process of replacing a segment of a prosodic word with a different segment. The presence or lack of certain phonemes in certain languages throughout the world is what leads to substitution (Usman, 2018).

III. Vowel harmony

Vowel harmony is a unique form of assimilation in which the vowels in the respective syllables, roots, stems, or affixes concur in terms of the tongue root so that they all concur to be a part of a harmonic set; Advanced Tongue Root [+ATR] or Retracted Tongue Root [-ATR] (Walker, 2011; Barasa, 2018).

IV. Deletion

Some segments of loanwords may be omitted when they are adapted into a language. This process is known as deletion. Deletion, also referred to as elision, is a phonological process that entails leaving out one or more-word segments, (Muriira 2017).

2.7 Adaptation in Asian Languages

Kenstowicz and Suchato (2006) examined English loanword 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 four main topics. Firstly, they examine the context-free adaptation of consonants that lack a direct phonemic equivalent in Thai. Secondly, they explore various contexts in which Thai accommodates the English binary voiceless-voiced opposition. Next, they discuss the modifications made to the loanwords to align with the Thai CVC syllable template. The final section delves into the 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. The authors also speculated that visual information might take precedence over auditory factors in these adaptations.

Sipra's (2013) study is of major significance when we discuss English loanwords that have entered the South Asian languages. His work focuses on English language borrowings into Urdu and examines the historical context of the interaction between Urdu and English. The study's findings reveal how the Indian subcontinent general public feels about the English language. It also provides a quick summary of the phonetic alterations made to the borrowed English words in Urdu. The author mainly concentrates on the justifications for borrowing; he does not go into further detail about the many forms of borrowing. It would not be silly to say that this research has highlighted gaps that still need to be filled.

Another researcher, Khan (2016), conducted a study to ascertain the effect of linguistic contact between English and Urdu. The data analysis reveals that the pronunciation of English terms that have been borrowed into the Urdu language has changed. The author claims that the natives feel more prestigious when using English words. As a result, English vocabulary has been incorporated into Urdu to a very considerable level.

In their study titled "Phonological Make-up of English Loanwords Incorporated into Punjabi via Urdu," Hussain et al. (2012) investigated the introduction of English terms into Punjabi through Urdu. The research emphasizes the differences and similarities between bilingual and monolingual speakers to establish the borrowing process. The study utilized two corpora: one comprising 421 English loans in Punjabi and Urdu, and the other containing 292 English loanwords in Punjabi. The findings indicate that the features of English loanwords produced by Punjabi monolingual speakers differ from those created by individuals who are bilingual and proficient in the interlanguage (Urdu). Additionally, the study identifies adaptation tactics like consonant replacement, metathesis, and aphaeresis used in the adaptation of English loanwords.

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. The data suggests that while English loanwords contribute to the expansion of Pashto vocabulary, the borrowing of these words is gradually eroding the inherent purity of the Pashto language.

Atta, Abbass, and Khan (2020) conducted a research study to investigate the adaptation of loanwords by Saraiki speakers. The research delves into the process of how Saraiki speakers adapt loanwords, providing a fundamental analysis. It scrutinizes loanwords originating from three distinct languages, revealing that Saraiki speakers employ various strategies within their native grammar for different languages. For instance, while adapting loanwords from one language, Saraiki speakers modify the onset or initial consonant cluster, whereas for another language, they alter the final consonant cluster. The study also discloses that Saraiki speakers used fixed vowels to break the cluster of English loanwords.

Farooq and Mahmood (2021) tried to explore the phenomenon of epenthesis in Urdu. The primary aim of this study is to discern the phonological causes behind epenthesis within Urdu vocabulary, which can result in various pronunciations of words. To achieve this, recordings spanning 10 hours of Urdu speech from a single female speaker have been meticulously analyzed as a preliminary test to identify words exhibiting multiple pronunciations. The speech data was captured at an 8 KHz frequency in an echoic chamber using PRAAT software. The findings of this investigation reveal several key points. Firstly, epenthesis, the insertion of sounds, is primarily observed in open-class words such as nouns, adjectives, verbs, etc., within the Urdu language. Secondly, epenthesis occurs specifically in consonant clusters positioned at the end (coda) of words in Urdu vocabulary. Thirdly, epenthesis is also noted at the beginning (onset) of words, but exclusively in English loanwords incorporated into Urdu.

2.8 Other Related Studies

Liljegren and Khan (2017) assert that Khowar utilizes seven places of articulation, among which five are vital in creating meaningful contrasts within its subsets of the manner of articulation. Further, they have deeply studied the Khowar language and claim that there are 41 consonant sounds and only five vowel sounds in Khowar.

Al Motairi (2015), a student at Eastern Michigan University, examined the Qassimi Arabic syllable structure using optimality theory. By using optimality theory as a theoretical framework, this dissertation examines the syllable structure in Qassimi Arabic, a dialect spoken in the Al-Qasim area of Saudi Arabia. This study uses OT to examine how superheavy syllables are handled in QA and how high vowel deletion affects syllable structure. The result supports the fundamental claim that, just as onset clusters are barred in QA, so too are trimoraic syllables.

Harb (2016) uses Optimality Theory (OT) in his study of English loanwords in Hawaiian. He has given preference to constrained-based analysis over rule-based analysis. For this, he randomly selected English loanwords in Hawaiian and analyzed the phonological changes in these loanwords through the lens of Optimality Theory. Numerous phonological modifications, mostly those of the syllable structure of Hawaiian, are analyzed along with supplementary phonological processes (e.g., epenthesis, degemination, etc.) where appropriate. He concludes various phonological processes are involved in the modification of English loanwords in Hawaiian.

Guba (2016) conducted a detailed study to investigate the phonological adaptation of English loanwords in Ammani Arabic. He focuses not only on the segmental level of adaptation of loanwords but also focuses on the suprasegmental/prosodic level, by using moraic theory within Optimality Theory (OT) framework. For this study, he has built a corpus of 407 loanwords from English and how they are pronounced by monolingual AA native speakers. The study unveils that the adaption of loanwords is mainly phonological, and the English loanwords undergo various modifications due to AA phonology. As far as segmental adaptation is concerned, the results of the study show that AA maps source segments onto their phonologically closest AA phonemes.

Muriira (2017), a student at Kenyatta University conducted a detailed study regarding morphophonological analysis of the degree of adaptation of English loanwords in Kitigania. Kitigania is a dialect of the Kiimeru language spoken in Kenya. The researcher aims to explore the morphophonological process in the adaptation of English loanwords and how these loanwords undergo some modifications from the source language. OT has been used as the theoretical framework and purposive sampling technique has been used. The study makes it clear that Kitigania has borrowed many words from English and these loanwords go through certain processes like deletion, substitution, prefixation, and epenthesis. This study confirms that OT can be sufficiently used for morphophonological processes of loanwords adaptation.

Al-Saidat's (2010) study entitled “Phonological Analysis of English Phonotactics: A Case Study of Arab Learners” aimed to analyze the English phonotactics in English of Arab learners of English as a foreign language. Its focus lies in identifying the particular pronunciation challenges they face. It delves into the declusterization processes within their interlanguage and investigates the origins of these processes. The findings reveal that Arab learners of English tend to inadvertently introduce an additional vowel sound both at the beginning (onset) and at the end (coda) of particular English syllables. Moreover, the study highlights that the primary cause behind these declusterization processes is the influence of the learners' native language.

Karim (2010) studies the phenomenon of vowel epenthesis in Bangla. The research study investigates the insertion of additional vowels within initial consonant clusters among Bengali speakers of English. It employs Optimality Theory (OT) to analyze this linguistic occurrence. Native Bengali words typically do not feature initial consonant clusters, and in loan words, many initial consonant clusters are simplified to adhere to these phonotactic rules. Bengali phonotactics limit the maximum syllabic structure to CVC, which speakers often apply to loan words as well. The argument presented suggests that in consonant clusters with rising sonority, a vowel is added between the two consonants. In falling sonority clusters (such as [s]-stop clusters), the vowel is inserted before the consonant cluster. This insertion of vowels within consonant clusters is attributed to the prohibition of consonant clusters in Bengali. Moreover, it is demonstrated that the preference for inserting a vowel before the [s]-stop cluster is governed by the CONTIG-IO constraint (Kager, 1999). Additionally, it is proposed that

aside from SYLLABLE CONTACT, two other constraints, *OO and *OR, also contribute to explaining the occurrence of vowel insertion in Bengali.

Previous studies have highlighted the adjustment of loanwords in various languages worldwide, extensively addressing strategies for their adaptation. However, in the case of Khowar, no specific research has been undertaken on the adaptation of loanwords. Despite a comprehensive study on the Khowar phonemic inventory, the aspect of loanword adaptation remains unexplored. This has led to the identification of a gap in the existing literature. Therefore, this study holds significant importance in recognizing English loanwords and exploring their integration into the Khowar language, along with analyzing the methods utilized for their adaptation. Additionally, it endeavors to investigate the phonotactic constraints within Khowar that have thus far remained unexplored to the best of the researcher's knowledge. The current study attempts to fill these gaps.

2.9 Conclusion

This chapter offered a comprehensive analysis of the previously conducted studies. It explained Khowar language, its history, and contact situation with English. Furthermore, English as a donor language, the process of lexical borrowing, and the adaptation strategies to adjust loanwords were addressed. Finally, the chapter ended by outlining relevant studies and identifying a research gap that requires exploration.

CHAPTER 3

3. RESEARCH METHODOLOGY

Research is a systematic work that enhances the stock of knowledge. It is the job of the researcher to go deep down into a phenomenon and try to solve problems. This section will explain the research design, data collection process, and tools. In addition to that research population, research sampling, research instruments, and theoretical framework will be explained.

3.1 Research Design

Research design is described by Kothari as, "a conceptual structure which consists of the blueprint for data collection, measurement and analysis of data" (Kothari, 2004, p. 31). The research design for this study is descriptive, as it was helpful in the analysis of the phonological changes in the structure of English loanwords during their adjustment in Khowar. A qualitative approach is used for the collection of data. The qualitative research method provided a detailed explanation of the phonological adaptation of English loanwords into a recipient language.

The rationale for choosing a qualitative approach was 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. The qualitative method facilitated the examination of how loanwords are modified and integrated according to the phonotactics of the recipient language. It allowed for the exploration of phonological changes that loanwords undergo during their incorporation.

3.2 Data Collection

The data for this study comprise English loanwords that have entered Khowar. The researcher used the method of participant observation for a span of two and a half months to collect the data (see Appendix A2). As a resident of Chitral district and a native speaker of Khowar, the researcher visited places of different semantic domains to obtain speech samples. The researcher extracted loanwords from conversations of Khowar speakers. An audio recorder was used as a research instrument to record the conversation

of native Khowar speakers. It was also used to record the articulation of the loanwords for transcription. Participant observation provided real-time data, which was used to monitor and track the use of loanwords as they occur. This gave valuable insights into how loanwords are used across different contexts and how they are pronounced.

When collecting data through participant 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 dictionaries. This means that the word must be in regular use among speakers of the recipient language and not be limited to specific contexts or specialized fields. The rationale for selecting dictionaries was that the collected words could be validated through it. This is because loanwords that are listed in dictionaries must be used regularly by native speakers of the recipient language, which is why they were added to the dictionary. Moreover, the dictionaries provided information about the origin of each loanword; allowing the researcher to compile loanwords acquired only from English.

Since the study deals with the phonological aspects of loanwords participant observation was used as it allowed the researcher to directly observe how loanwords are used in different settings and how they are pronounced. It also helped the researcher to explore the phonotactic constraints of Khowar. The dictionaries assisted in identifying whether a word is a loanword or not.

Table 5
Sample Loanwords

	English	Khowar	Gloss
01	ka:d	ka:t	Card
02	bæg	bek	Bag
03	fɪlm	fɪli:m	Film
04	məʊtə(r)	mɔtɛ:r	Motor

3.3 Research Instrument

The research instruments for the collection and identification of English loanwords were an audio recorder, an observation sheet, and two dictionaries. The researcher used an audio recorder as a key data collection tool. With an audio recorder, the researcher collected all the spoken data from the conversation of Khowar speakers. Observation sheets were used by the researcher to specify the exact location where the observation was taking place. These conversations were transcribed using IPA symbols, and loanwords were extracted. Dictionaries often include those loanwords that have been nativized therefore two Khowar dictionaries were used for the validation of a loanword. All the collected loanwords were listed on the word list table.

3.4 Research Population and Sample

Khowar language is spoken in different parts of Pakistan, like in Swat, Ghizer, and Yasin valleys of Gilgit Baltistan, etc., so, it was quite difficult to carry out research by including Khowar speakers of all these regions of Pakistan. As the main objective of this research study was to analyze the phonological changes in the structure of English loanwords during their adjustment, consequently, the researcher selected Khowar speakers residing in Chitral, the birthplace of the language, as the research population.

3.5 Sample and Sampling Technique

As the population of district Chitral is massive, the researcher could not include each and everyone in his study. Therefore, the researcher adopted a purposive sampling technique to identify three semantic domains to collect loanwords. This technique enabled the researcher to identify knowledgeable individuals in the targeted area of the study.

These domains included a bus terminal, an electronic shop, and an educational institution. The researcher made the presupposition that these semantic spheres would yield a large number of English loanwords. The researcher sampled six participants for observation based on their level of education, age, and occupation. Thus, two participants were selected from each domain. These participants comprised dealers in electronic shops, teachers in schools, and drivers in bus terminals.

The education institution was selected because it gave a large number of loanwords that are commonly used in educational settings. The researcher spent time in the school environment, closely observing the interactions and conversations among teachers. The researcher engaged himself in conversation with the teachers as well. An electronics shop was considered because the dealers and the clients are often engaged in using English terms. And the bus terminal was selected for observation because it often includes monolingual speakers that are predominantly illiterates i.e., they do not have any formal education. By selecting this domain, the researcher was able to assert that the English loanwords are utilized not just by educated people, but also by the illiterate native Khowar speakers.

The study sampled two educated informants who have achieved a higher level of education. These two were selected from the domain of educational institutions. Then two semi-literate informants were selected from the domain of the electronic shop who had done matriculation or even lower education. Finally, two illiterate informants were selected from the domain of the bus terminal. Their education level was nil.

Cumulatively, two literate, two semi-literate and two illiterate informants were sampled. The age of the informants ranged from 25 to 55 and that vary from domain to domain. All the respondents were male because Chitral is a male-dominant area where it is practically hard to incorporate women for observation. As a result, gender was not regarded as an important variable. The sole purpose of doing participant observation was to collect loanwords to observe how they are used as well as pronounced. These settings allowed the researcher to observe in what ways English loanwords have been incorporated into the Khowar language. Moreover, out of the total English loanwords collected a sample of forty have been analyzed.

3.6 Theoretical Framework

Theoretical Framework is one of the most important parts of a research study. It helps any researcher to organize the data. As this research is related to lexical borrowing, a relevant theoretical framework has been adopted.

To analyze the phonological adaptation of the English loanwords in Khowar, Optimality Theory has been used as the theoretical framework. Optimality Theory was given by Prince and Smolensky in 1993 and later modified by Kager in 1999. OT is a constraint-based theory that rejects the notion that grammatical constraints are inviolable (Prince & Smolensky, 1993). According to Feehan (2016), OT allows us to explain grammar as universal violable constraints instead of language-specific rules. The analysis of loanwords from the perspective of phonology has gained a new interest due to the advent of Optimality theory (Kenstowicz, 2012). OT is not limited to phonology, rather it is used in other domains of linguistics like syntax (Grimshaw, 1997). OT claims that any language in any part of the world can tackle any borrowed word in its phonological system (Nkieny, 2021). It has been used as a theoretical framework because according to Kang (2011), it best suits to investigate the adaptation of loanwords in a language. There are four main components of Optimality Theory (Prince & Smolensky 1993; Kager, 1999)

a) LEX: That is a word in the form of input.
b) GEN: It is the operational component of Optimality Theory (OT). It takes input and creates output that is different from the input. It generates several candidates.
c) CON: It is the main component of OT and contains the constraints known as "markedness" and "faithful". It provides guidelines for choosing between candidates produced by GEN.
d) EVAL: It evaluates the output candidates and points out the optimal candidate that least violates the constraints.

Thus, GEN first receives input and generates several candidates. Eval then evaluates these candidates against language-specific constraints. The candidate with the fewest violations of the limitations is ultimately determined to be the best or optimal candidate.

The two sorts of constraints that make up CON are markedness constraints and faithfulness constraints, as was previously explained. These two are in opposition to each other. Markedness constraints impose conditions on the well-formedness of the output structure. As described by McCarthy (2007), they ensure that the output forms meet

specific criteria of structural well-formedness. Markedness constraints enforce conditions on the well-formedness of the structure of the output. While faithfulness constraints focus on the sameness of the input and output. However, this opposition creates tension, but to settle this tension, the constraints are ranked into higher-ranked constraints and lower-ranked constraints based on the level of violation. These constraints are prioritized on a language-specific basis, for example, if constraint Y is given importance over constraint Z, we write Y >> Z. Tableau is used for data analysis in OT.

Table 6

Tableau of Optimality Theory

CANDIDATE SET	CONSTRAINT 1	CONSTRAINT 2	CONSTRAINT 3
☞ a CANDIDATE A		*	
b. CANDIDATE B	*!		
c. CANDIDATE C		*!	*

Note. Taken from Kager,1999

This is the tableau that is used in OT for data analysis. Candidates are given in columns while constraints are given in rows. When any violation occurs, it is denoted by an asterisk*, and if there is no violation the constraint is left blank. Fatal violation is shown by "!" while the optimal candidate is indicated by finger-pointing ☞. Whenever an English word is incorporated into the Khowar language, it undergoes a process of generation (GEN), which creates multiple candidates with various phonological realizations. Optimal candidate selection is dependent on the interaction of markedness and faithfulness constraints.

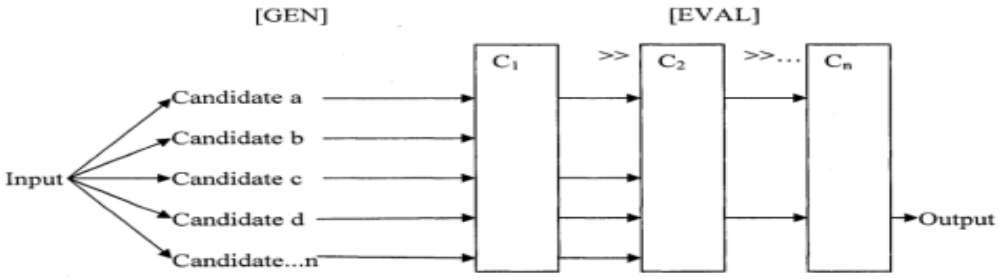

Figure 5: IO Mapping in OT Grammar (Kager, 1999: p. 8)

3.7 Rationale for Choosing OT

OT is a constraint-based theory, and it accounts for the processes involved in the adaptation of a loanword. It also accounts for the changes in the structure of the loanwords and provides a detailed explanation. OT is beneficial to analyze the degrees to which a loanword is modified according to the phonotactics of the recipient language. When it comes to the degree of adaptation of words, OT explains how language users adapt words based on specific constraints. For example, in a situation where a word needs to be adapted to fit into a particular grammatical context or to conform to certain phonological patterns, OT can shed light on the factors that influence these adaptations. Within the OT framework, constraints are ranked, which means that some constraints are considered more important than others. The ranking of the constraints determines the relative importance of each constraint in the language system. By manipulating the ranking of constraints, OT can account for the degree of adaptation observed in language.

Thus, Optimality Theory (OT) was a relevant theoretical framework for the study of English loanword adaptation in Khowar. The English loanwords go through some phonological changes to be adjusted in the phonotactics of the Khowar language. The adaptation processes comprise deletions, phoneme substitutions, and cluster simplification or insertion of a sound segment. Optimality theory (OT) explains how the input, such as the English loanword, is mapped onto an output, which is the winning and adjusted loanword. It also offered insights into why certain adapted forms are selected over other potential candidates. It was chosen because it better explained linguistic phenomena. In this study, English lexemes were taken as input while the adapted form of the input in Khowar was considered as output. Hence, the analysis was carried out using Optimality Theory as a theoretical framework.

CHAPTER 4

4. DATA ANALYSIS

This chapter comprises the presentation and analysis of the data that has been collected. In the analysis of data, the researcher has applied the qualitative data analysis method to analyze the phonological processes that are used to nativize an English loanword in Khowar language. Focusing on the objectives of this research, this chapter first deals with the loanwords collected through participant observation. Secondly, it deals with the phonological processes involved in the adaptation of loanwords. These are also called repair strategies. Finally, the phonotactic constraints in Khowar that lead to structural changes in English loanwords following adaptation are highlighted. The gathered data is examined in accordance with the theoretical framework chosen for the study, i.e., the Optimality Theory (OT). It is probably the first study where the researcher has tried to analyze the phonological adaptation of English loanwords in Khowar using OT. This data analysis describes how the two constraints, faithfulness and markedness interact to choose the best candidate for the output.

4.1 Data Presentation

The data is limited to phonemic loans**.** The researcher was well aware of the fact that Khowar does not have any calque loans and loan blends and it motivated the researcher to start gathering loanwords only. Phonemic transcription was utilized to explain the phonological structure of English words in both their original phonology and their realizations after being adjusted into Khowar. The study has used tableaus to investigate the phonological derivation of the English loanwords using the guidelines of the Optimality Theory framework. To choose the best candidates, OT analyzed several inputs, that were given in the form of English words, against the constraint hierarchies that were provided. Similarly, for each tableau, an input was provided, and an infinite number of candidates were created, but a few can be seen on the left side of the tableau, as it was impossible to add all candidates. The input form with the fewest violations of a set of violable constraints is the best option for the most harmonic output. The winning candidate engaged in a competition with other candidates. Furthermore, tables provide an

overview of the phonological modifications, loanwords have gone through to become part of the Khowar language.

4.2. Constraints in OT

Constraints are a fundamental concept in Optimality Theory (OT), a framework within theoretical linguistics that aims to explain how languages are acquired, represented, and processed. In OT, constraints are used to analyze how speakers choose between different possible outputs when faced with a particular input. In OT, constraints are divided into two main types: faithfulness and markedness. Faithfulness constraints prioritize maintaining the underlying forms of words or the input-output correspondence in a language, while markedness constraints prioritize the use of "unmarked" or more "natural" linguistic forms. It focuses on the well-formedness of the output.

Each constraint is assigned a numerical ranking that reflects its relative importance compared to other constraints. When an input is given to GEN, it generates multiple possible outputs, each of which violates one or more constraints to a different degree. The output that violates constraint in the fewest number of ways is considered to be optimal. The constraints are flexible and can be modified to accommodate different linguistic phenomena and they are ranked accordingly.

Thus, constraints are a central concept in OT because they allow linguists to analyze how speakers prioritize certain linguistic forms over others, and how this prioritization can change over time or across different contexts.

4.2.1 Faithfulness Constraints

In Optimality Theory (OT), faithfulness constraints are a type of constraint that evaluates how closely a candidate's pronunciation (output) matches the underlying form (input) of a word. Faithfulness constraints are used to ensure that a word's phonological structure is preserved during the process of phonetic realization. They evaluate the similarity between the input and the output and penalize any deviations from the underlying form.

For example, the constraint "IDENT-IO" (Identity for IO) would penalize any change in the vowel quality of a syllable nucleus. If a candidate output changes the vowel quality in the nucleus of a syllable from the input, this constraint would assign a violation.

Similarly, the constraint "MAX-IO" (Maximal IO) and DEP-IO would penalize any deletion or addition of a segment from the input.

The goal of the faithfulness constraint is to safeguard the underlying structure of the word, while other constraints might prioritize a particular pattern or distribution of sounds. However, in certain situations, the faithfulness constraints can be outranked by other constraints, such as those that promote more frequent patterns in the language or those that facilitate ease of articulation. The ranking of constraints can differ depending on the language and the specific analysis.

4.2.2 Markedness Constraints

Markedness constraints are a type of constraint in Optimality Theory (OT) that prioritize simpler or more common forms over more complex or less common forms in a language. In OT, constraints are used to analyze how speakers choose between different possible outputs when faced with a particular input.

Markedness constraints work by penalizing outputs that contain complex or uncommon forms, and prioritizing outputs that contain simpler or more common forms. For example, markedness constraints include "NoCoda," which favors words that end in a vowel rather than a consonant, and "ONSET," which favors syllables to begin with an onset. Overall, markedness constraints are an important component of OT because their competition with faithfulness constraints helps to pick the optimal candidate.

4.3 Adaptation Strategies

At the phonological level, the idea of loanword adaptation revolves around the syllable well-formedness in the recipient language. When a term is borrowed from another language, the rules of syllable well-formedness are broken. The recipient language subsequently takes prompt action and employs specific techniques to modify the loanword according to its phonotactics. Such strategies are known as adaptation or repair strategies. The repair strategies that Khowar uses to avoid syllable ill-formedness of English loanwords and that are focused on in this study are:

- Epenthesis
- Substitution
- Deletion

From the optimality theory point of view, these strategies are markedness constraints that focus on the well-formedness of the output. These strategies stand in opposition to faithfulness constraints like MAX-IO, DEP-IO, IDENT-IO, etc. In Khowar when foreign words are borrowed, they undergo certain modifications to agree with its phonotactics. As a result, markedness always takes precedence over faithfulness constraints.

Markedness >> Faithfulness

4.4 English Loanwords in Khowar

The data has been collected through participant observation. As a resident of the Chitral district and a native speaker of Khowar, the researcher visited different domains to collect data. These domains include a mobile shop, a bus terminal, and an educational institution. By visiting these domains, the researcher collected speech samples where loanwords were articulated. These speech samples were recorded via an audio recorder. The device used for the recording of the conversations was the HUAWEI Mate 10 lite. The study's first objective was to identify English loanwords therefore a total of 82 loanwords were collected and 40 of them were analysed using Optimality Theory.

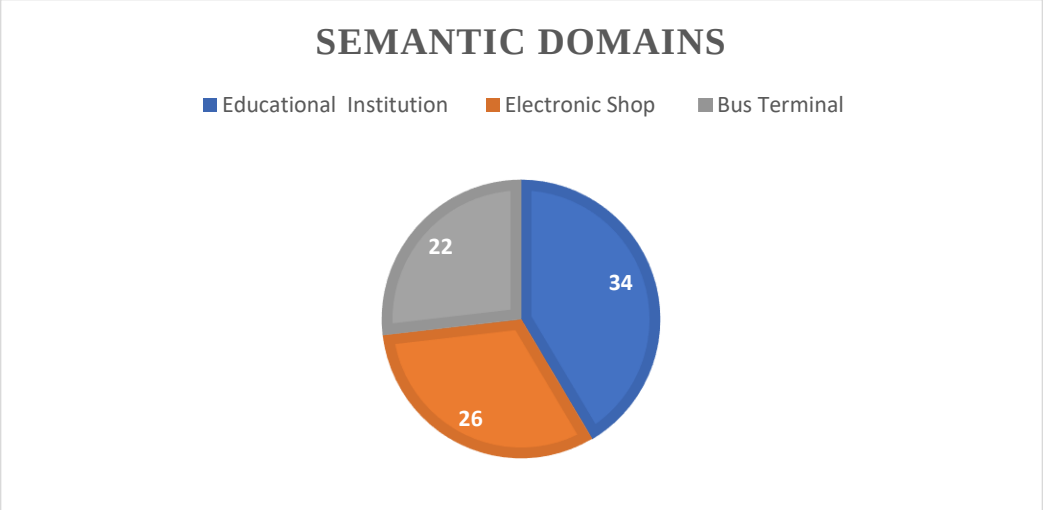

Figure 6: Distribution of Loanwords in the Selected Semantic Domains

4.5 Epenthesis

Epenthesis is a process in which sound segments are added or inserted within a word. Inserted sound can be a vowel or a consonant, but in Khowar usually, vowels are added in between words as it will become obvious after the analysis of data. Epenthesis

in Khowar occurs to break down consonant clusters at different positions. Below are some words where epenthesis has occurred to adjust English loanwords in Khowar.

Table 7
Epenthesis used for Adjustment of Loanwords

S.no	IPA Transcription	Khowar Transcription	Deviation	Gloss	Phonemic Variations
1	skuːl	ɪs.kuːl	1	School	Ø →[ɪ]
2	stɔː(r)	ɪs.tɔːr	1	Store	Ø →[ɪ]
3	klɪnɪk	kɪlɪnɪk	1	Clinic	Ø →[ɪ]
4	klɪp	kɪlɪp	1	Clip	Ø →[ɪ]
5	klɑːs	kɪlɑːs	1	Class	Ø →[ɪ]
6	glɑːs	gɪlɑs	1	Glass	Ø →[ɪ]
7	fɪlm	fɪliːm	1	Film	Ø →[iː]
8	bʌtn	bɑtèn	1	Button	Ø →[è]

4.5.1 Epenthesis of Vowel [ɪ]

In vowel epenthesis, a vowel is inserted between two consonants. A vowel segment can be inserted at the word's initial position known as prothesis. It is a type of epenthesis in which a sound is added to the beginning of a word (Campbell, 1998). It can also be inserted between two consonants, known as anaptyxis. Epenthesis is seen to be a very common loanword adaptation strategy when borrowing words from English into Khowar.

Vowel epenthesis is the addition of a vowel sound between two consonants in a word to make it easier to pronounce. This is a common phonological process in numerous languages, including English. For example, in the word "athlete," some people may naturally insert a schwa sound (uh) between the /th/ and /l/ consonants, pronouncing it as "ath-uh-leet" instead of "ath-leet." Similarly, in the word "film," some people may insert a schwa sound between the /l/ and /m/ consonants, pronouncing it as "fil-uhm" instead of "film" (Trask, 1996, p. 24). Vowel epenthesis can occur for a variety of reasons, including to break up a difficult consonant cluster, or to make a word easier to pronounce. It can also occur in different contexts or dialects, resulting in variations in pronunciation among speakers.

In OT terms, epenthesis violates the faithfulness constraint DEP-IO because there is no counterpart for the epenthetic section in the input. Vowel epenthesis often targets consonant clusters. The phonotactics of Khowar allows onset and coda in its syllable structure but usually avoids complex onset or coda. Therefore, the markedness constraint *COMPLEXcc is ranked higher in Khowar. As it is universal that syllables must have a nucleus therefore syllables in Khowar have a nucleus. The NUC/V constraint is hence the higher ranked one. These markedness constraints in OT conflict with the faithfulness constraint, DEP-IO, which avoids any sort of insertion and requires the output to have the same elements as the input. Thus, the constraints ranking for the strategy of vowel epenthesis will be:

NUC/V, *COMPLEXcc >> DEP-IO

Using OT, loanwords are analyzed below to show how epenthesis works in Khowar to avoid CC and adjust loanwords according to their phonotactics.

(1) School

Tableau 1: Ø →[ɪ]

[skuːl]	NUC/V	*COMPLEX cc	DEP-IO
a. ☞/ɪs.kuːl /			*
b. / skuː.l /	*!	!	
c. / skuːl /		*!	

Word initial, as well as middle clusters, are often repaired using epenthesis. There are two ways through which vowel epenthesis occurs. The first one is prothesis, which is the insertion of a sound in the initial syllable. Secondly, there is paragoge, which is the addition of sound to the end syllable. However, epenthesis can also be applied in a word's middle syllable as well. It is used by Khowar speakers to declusterize the English syllables. The above data shows the English loanword where the vowel segment has been added at the word initial position. The front, short, unrounded vowel [ɪ] is added at the beginning of English loanwords "school".

The phonotactic constraints of Khowar do not often allow a series of consonants in both the onset and coda position. In the above English loanword, candidate 'b' fatally violates the markedness constraints NUC/V, which claims that all syllables must have a

nucleus. The lateral /l/ stands alone trying to make a syllable without a nucleus. It cannot be an optimal one. Candidate ‘c’ is a faithful non-epenthetic candidate that is violating the highly ranked markedness constraint *COMPLEX cc, as there is a cluster of two consonants the voiceless fricative /s/ and the voiceless velar /k/. Therefore, both these are rejected for an optimal candidate. Candidate “a” is optimal because it does not violate any highly ranked constraints rather it separates apart the consonant cluster [sk] using vowel epenthesis and adjusts the loanword according to the phonotactics of Khowar.

Punjabi language as well as Sariki on the other hand also does not allow this [sk] consonant cluster at the onset position (Habib & Khan, 2019; Atta et al., 2020). However, the insertion of vowels occurs at different positions in both languages. Accordingly, the English loanword /skuːl/ is adjusted using an epenthetic vowel in between the consonant clusters. The word /skuːl/ is pronounced as /səkuːl/ in Saraiki and Punjabi. But Khowar uses the technique of edge epenthesis also known as prothesis in the adjustment of the English loanword. A similar pattern is seen in the pronunciation of English words by the native Hindi speakers as described by Bharati (1994). For these speakers, initial clusters, like /st/, /sm/, or /sk/ clusters, are resolved through prothesis: e.g. [ismaail] 'smile’ (Fleischhacker, 2005). This same loanword is adjusted in Bengali with the help of edge epenthesis (Karim, 2010). For example the English loanword /skuːl/ is pronounced as/ ɪs.kuːl/. Therefore, Hindi, Bengali, and Khowar adjust the English loanword using the technique of edge epenthesis. School / skuːl/ in English is a monosyllabic word, but when it is adjusted in Khowar it becomes a disyllabic word e.g., /skuːl/ converts into / ɪs.kuːl/.

- Violation of DEP-IO by the Optimal candidate: Ø →[ɪ]

Input s k uː l

↑

Output **ɪ** s k uː l

(2) Store

Tableau 2: Ø →[ɪ]

[stɔːr]	NUC/V	*COMPLEX CC	CONTIGUITY	DEP-IO	*Coda
☞a./ ɪs.tɔːr/				*	*
b. /sɪtɔːr /			*!	*	*
c. /stɔːr/		*!			*

In Khowar, as in many other languages, vowel epenthesis manifests in two distinct manners. It is observed either at the outset, prior to the clusters, or amid these clusters, causing them to break apart. But the main aim of both these ways is to avoid complex consonants in a syllable. Fleischhacker (2005) claims that ‘st’ and ‘sr’ clusters may be repaired by inserting the vowel either before the clusters or inside it. Persian speakers according to Cardoso (2008) employ the phenomenon of edge-epenthesis at the initial position when articulating words that begin with consonant clusters like /sl/, /st/, and /sn/. Examining the provided data will offer a more comprehensive understanding of how the English loanword starting with the consonant clusters /st/ is adjusted in Khowar.

The data above illustrates the introduction of a vowel at the initial position of a word. It is worth highlighting that the occurrence of epenthesis promotes a markedness constraint *COMPLEX CC, and it always stands in opposition with the faithfulness constraint DEP-IO, which strictly opposes any sort of insertion and CONTIGUITY which claims that items nearby in the input must also be adjacent in the output. Therefore, the *COMPLEXcc constraint always dominates DEP-IO and CONTIGUITY constraints. While languages might permit codas at the syllable's end, they should not be complex according to an OT constraint. The *CODA constraint also represented as *C]σ, stipulates that any syllable, if present, must remain open. In Khowar, syllables frequently exhibit a coda at the final position, which designates *CODA as a constraint of relatively lower priority.

Candidate ‘a’ emerges as the winner because it shows no violation of highly ranked markedness constraints NUC/V and *COMPLEXcc despite violating the lower ranked DEP-IO and *CODA constraints. The syllables contain nuclei in the form of vowels thus satisfying NUC/V. In the underlying input, there exists a cluster of voiceless alveolar fricative /s/ and voiceless alveolar plosive /t/. However, the optimal candidate resolves this consonant cluster by introducing an epenthetic short vowel /ɪ/. This initial epenthesis successfully avoided a complex onset, resulting in only one violation of DEP-IO.

Candidate 'b' contends against candidate 'a' in the pursuit of optimality. It remains free from any transgression of the constraints that hold greater priority. It loses to candidate ‘a’ due to the violation of lower ranked constraint CONTIGUITY. Elements

adjacent in the input do not have a similar order in the output. Epenthetic vowel /ɪ/ has distorted the order of sound segments in candidate 'b'. Candidate 'c' is also rejected because of the violation of the *COMPLEXcc constraint.

In the above two data, it can be observed that the voiceless alveolar fricative /s/ when followed by obstruent at the syllable initial position often takes the /ɪ/ vowel to separate the consonant cluster. In simple words when there is an s+obstruent sequence in the initial position of a loanword syllable, it is adjusted in Khowar by using vowel epenthesis in the word's initial position. This phenomenon is also referred to as edge epenthesis. However, this differs from Punjabi and Urdu, where the occurrence of epenthesis between a syllable that starts with /s/ and is followed by a voiceless stop is prevalent (Mahboob et al., 2008; Farooq & Mahmood, 2021). Gouskova (2001) mentions that a vowel is placed between the two consonants at the beginning of increasing sonority clusters. Additionally, the vowel is added before the cluster, particularly before s-obstruent clusters in falling sonority clusters. As a result, in Khowar just like in Bengali, the vowel is placed before the cluster that has falling sonority, particularly s+obstruent clusters (Karim, 2010). Also, we can observe that anaptyxis (vowel insertion) is more frequent than excrescence (consonant). The constraints ranking then is:

NUC, *COMPLEXcc >> DEP-IO>> *CODA

- Violation of DEP-IO by Optimal candidate: Ø →[ɪ]

Input: s t ɔː r

↑

Output: ɪ s t ɔː r

(3) Clinic

Tableau 3: Ø →[ɪ]

[klɪn.ɪk]	*[σ CC	ONSET	MAX-IO	DEP-IO	*Coda
a. klɪn.ɪk	*!	*			**
b. klɪ.nk	*!		*		**
☞c. kɪ.lɪ.nɪk				*	*

There are open syllables in a language if it has closed ones. Languages are divided once again into two main groups based on whether they permit or prohibit codas. For instance, codas are allowed in Arabic and English while Fijian disallows codas (Aljutaily & Alhoody, 2020). Most importantly, no known language requires that syllables must always contain codas. In Khowar, the phonotactic rule permits the presence of both open and closed syllables. A closed syllable ends with a consonant most importantly known as coda. Thus, Khowar allows consonant at the coda position, but it should not be a complex one. Lee (2005) claims that numerous consonant clusters in English are not commonly present in many languages, whether positioned at the beginning (onset) or the end (coda) of words. Therefore, an insertion strategy is employed when handling these foreign words to align them with the native vowel and consonant system and adhere to the phonotactics of the language. In simpler terms, although Khowar permits the use of onset and coda, it is highly unusual for a complex onset or coda to be permitted. Therefore, *CC]σ (no complex onset) is ranked higher in Khowar but *C]σ (no coda) is ranked lowest.

According to Farooq and Mahmood (2021), the process of phonemic insertion alters a monosyllabic word to become a disyllabic one, a disyllabic word to become a trisyllabic word, and vice versa. The input given is disyllabic however after the insertion of /ɪ/ during adjustment in Khowar it has become trisyllabic. There is an addition of a new constraint ONSET, also represented as *[σ V. It claims that syllables should have onsets. Only syllables with an initial consonant, often known as the "onset," may satisfy it. Languages can also be divided into two broad categories: those that permit onset-less syllables, like Japanese, and English, and those that do not. The most important thing to remember is that no known language disallows onsets. In Khowar syllables usually begin with an onset. Consequently, the ONSET constraint holds a position of higher priority as a markedness constraint. Words in Khowar may begin without an onset, therefore the constraint is ranked higher but not that much as compared to NUC/V or *COMPLEXCC.

Against the given input above the generated candidate ‘a’ cannot be chosen as the optimal one because there is a cluster of voiceless velar plosive /k/ and voiced lateral /l/. It violates highly ranked constraint *COMPLEX CC henceforth *[σ CC and *CC]σ. The next constraint ONSET is also violated by candidate ‘a’ because the second syllable begins without an onset. It cannot be an ideal one since it violates the highly ranked markedness constraints. Multiple times, candidate 'b' fatally breaches the highly ranked markedness restrictions. It is likewise disqualified as the optimal one as a result. It

additionally violates the lower-ranked constraint MAX-IO. The vowel /ɪ/ is deleted allowing it to form a cluster at the syllable-final position.

Ultimately, candidate "c" emerges as the overall optimal choice since it adheres to the most prioritized markedness constraints without any violations. Its syllables are uncomplicated, and each one of them begins with an onset. It however violates the faithfulness constraint DEP-IO, but this is a violation of the lower-ranked constraint, therefore, it does not impede candidate 'c' from being considered optimal. Moreover, a breach of a lower-ranking constraint occurs to satisfy a higher-ranking constraint.

The final constraint is violated once or twice by all the selected candidates. The ONSET constraint is ranked higher than the NoCoda constraint. The onset-less final syllable is adjusted through a re-syllabification process to avoid violation of the ONSET constraint. However, the syllable remains closed even after adjustment of the input in Khowar. Hence it is generalized that ONSET>>NoCoda, specifically in the adaptation of loanwords in Khowar. Khowar prefers vowel epenthesis to deletion therefore MAX-IO is ranked higher than DEP-IO.

In many languages, while adjusting foreign words, the short vowel /ɪ/ is mostly utilized to simplify complex clusters. According to Saidat (2010), certain English syllable structures present challenges for Arab English learners. To resolve this, they simplify the consonant clusters by inserting a high front short vowel /ɪ/, such as in the case of /sɪblʃ/ for "splash." Farooq and Mahmood (2021) in their research study entitled “Epenthesis in Urdu” aimed to find out the reasons behind different pronunciations of a single lexical item. They found that epenthesis was one of the key factors. The study further claims that in Urdu if a consonant comes before a liquid sound /r/ or /l/, epenthesis occurs to break the consonant cluster. The same is the case with Khowar as analyzed above. The English loanword has a consonant before liquid /l/ therefore epenthesis has occurred to break the consonant cluster. The ranking of constraints is given as:

*COMPLEXcc >> ONSET >> MAX-IO>> DEP-IO >> NoCoda

- Violation of DEP-IO by Optimal Candidate:

Ø →[ɪ]

Input: k l ɪ n. ɪ k

↑

Output: k ɪ .l ɪ. n ɪ k

(4) Clip

Tableau 4: Ø →[ɪ]

[klɪp]	NUC/V	*OL	*[σ V	DEP-IO
☞a. kɪ.lɪp				*
b. klɪp		*!		
c. kɪl.ɪp			*!	*

Jabbari and Pourmajnoun (2016) examined various approaches employed by Persian learners when encountering English consonant clusters at the beginning of words. Their findings indicated that the predominant strategy utilized by learners is vowel epenthesis. In the data provided above the technique of vowel epenthesis has been utilized to adjust the English loanword in Khowar. It has increased the syllable weight from mono to disyllable. As we know, a syllable must contain a universally obligatory nucleus thus the constraint NUC/V is universal for all languages. Candidate 'b' is a non-epenthetic faithful candidate. It complies with the lowly ranked faithfulness constraint DEP-IO and the other two markedness constraints; however, it fatally violates one of the highly ranked *OL constraints (that forbids the sequence of any obstruent and a liquid cluster in a word's syllable).

Candidate 'c' satisfies the markedness constraints NUC/V and *OL but fatally violates another higher-ranked markedness constraint ONSET henceforth (*[σ V), as it lacks an onset in the final syllable. It also violates the least ranked faithfulness constraints DEP-IO since there is an insertion of a vowel. Therefore, it is confirmed that candidate 'c' is the most disharmonic one. Candidate 'a' in this scenario is an optimal candidate as it does not violate any higher-ranked constraints. The syllables do not have any sequence of liquid and obstruent, they start with an onset, and they have a nucleus. Therefore, the markedness constraints including NUC/V, *OL, and *[σ V are all satisfied. The prioritization of the markedness constraint over the faithfulness constraint is necessary to choose the best candidate which shows an alternation over other possible candidates that do not (Karim, 2010).

Hafez (1996) argues that certain varieties of Arabic do not allow complex onset. He gives the example of Egyptian Arabic where the English loanword (protein*)* is adjusted using vowel epenthesis to [bɔ.rɔ.tiːn]. Likewise, in Bengali onset consonant clusters are

strongly prohibited (Karim, 2010). In Bengali, the maximum syllabic structure allowed is CVC, and speakers frequently maintain this limitation even when using loanwords. In the same way, the phonotactic rules of Khowar do not allow for an onset consonant clusters, thus, vowel epenthesis is utilized whenever a loanword consists of a complex onset.

The ranking of constraints is:

NUC/V, *OL >> ONSET >> DEP-IO

- Violation of DEP-IO by Optimal Candidate: Ø →[ɪ]

Input: k l ɪ p

↑

Output: k ɪ. l ɪ p

(5) Class

Tableau 5: Ø →[ɪ]

[klɑːs]	NUC/V	*OL	*OBS VOI	DEP-IO
a. /kɪ.lɑːz/			*!	*
☞b. /**kɪ.lɑ**ː**s**/				*
c. klɑːs		*!		

This insertion of a vowel is due to the phonotactic constraints of Khowar language as asserted by Dupoux (2003) that the phonemic inventory of a language affects the way users perceive the sounds of non-native languages. Since Khowar does not permit clusters at either position, it seems reasonable to consider this as a potential explanation for the occurrence of epenthesis. According to Jabeen, Mahmood, and Asghar (2012), epenthesis is a frequent and noticeable phonetic trait of Pakistani English. Pakistani speakers regularly add a brief vowel sound before or within a syllable containing a consonant cluster. The analysis will explain it further.

The tableau shows the adaptation of the English loanword [klɑːs]. The candidates are generated and given in the tableau. Their competition against the constraints will eventually select the optimal one. The analysis starts with candidate ‘a’ which is violating higher-ranked constraint *OBS VOI, which demands obstruent to remain voiceless at the coda position. The final syllable ends with the voiced fricative /z/ in the coda position.

The lower-ranked constraint DEP-IO is likewise violated. It is therefore rejected for an optimal candidate. Candidate ‘c’ is violating the higher-ranked constraint *OL. The cluster of liquid and obstruent at the syllable initial position is the main cause of rejection of this candidate. Though it satisfies all other constraints, it cannot be chosen as an optimal candidate. It should be observed that no amount of satisfaction of a constraint having a lower rank can defeat a single violation of a constraint with a higher rank.

We are left with the only candidate that shows no violation of any of the higher-ranked constraints. Its syllables contain a vowel as a nucleus, both the onset and coda in both syllables are simple. As a result, it may be said that candidate 'b' is the best option because it meets all the highly ranked constraints. It violates the lower-ranked constraint DEP-V. The insertion of a vowel is the violation of DEP-V, but the satisfaction of the *OL constraint.

It is noted that when there is a sequence of stop + liquid in the loanword, it is adjusted in Khowar by inserting a short vowel /ɪ/. Same as Khowar, in Pahari as noted by Abbasi, Khan, and Shafi (2022) when there is a combination of stop and liquid, /ɪ/ is used in between consonants to break it. For example, blue / blu:/ a monosyllabic word is pronounced as / bılıu/. Similarly, the word grim /grım/ is pronounced as / gırım/.

The ranking of constraints is represented as:

NUC/V >> *OL >> *OBS VOI >> DEP-IO

- Violation of DEP-IO by Optimal Candidate: Ø →[ɪ]

Input: k l ɑː s

↑

Output: k ɪ. l ɑː s

(6) Glass

Tableau 6*: Ø →[ɪ]*

[glɑːs]	*[σ CC	*[σ V	DEP-IO	*C]σ
a. glɑːs	*!			*
b. gıl.ɑːs		*!		**
☞c. gɪ.lɑs			*	*

Khowar is a language where there are closed as well as opened syllables. Therefore, the constraint *CODA or *C]σ is a least ranked in the case of Khowar. The analysis of data will further explain why *C]σ is ranked lower. The input given is the loanword [glɑːs]. The best possible candidates are generated and pasted into the OT tableau. The competition of these candidates against the given constraints will eventually confirm the optimal candidate.

The analysis begins with candidate ‘a’. It satisfies the *[σ V and the other lower-ranked constraints. It begins with an onset hence satisfying *[σ V. Also, no sound segment is inserted. Therefore, the DEP-IO constraint is satisfied. Yet, it does not satisfy the highly ranked *[σ CC constraint which is dominant in many other Pakistani languages e.g., Saraiki (Atta et al., 2020). As it is obvious that the candidate ‘a’ syllable has a cluster of consonants e.g., the voiced plosive /g/ and the voiced approximant /l/. The avoidance of the epenthetic vowel /ɪ/ causes the rejection of candidate ‘a’.

Candidate ‘b’ has an onset-less second syllable therefore fatally violating highly ranked *[σ V constraint. It is also declared as the disharmonic one. Now we have our harmonic or optimal candidate which is ‘c’. It causes no violation of any highly ranked constraints. The insertion of the unrounded vowel /ɪ/ has broken the initial consonants to satisfy the *[σ CC constraint. The lower ranking constraint DEP-V is violated to satisfy this constraint. Then, both the syllables start with an onset satisfying *[σ V. Thus, the last candidate in the OT tableau i.e., candidate ‘c’ is the optimal one. The *[σ V >> *C]σ is proved again as the last constraint *C]σ is violated but the *[σ V is satisfied by the most harmonic candidate.

Thus, Khowar speakers change the English loanwords which they find difficult to pronounce. Turkish speakers find it very difficult to pronounce English words that have consonant clusters especially when there is a combination of stop and liquid (Beel & Felder, 2013). For example, the word graffiti [grəfiti] has been borrowed in Turkish. While English permits the consecutive placement of consonants [g] and [r] due to its phonological and syllabic structure, Turkish speakers encounter significant difficulty in pronouncing this combination without making adaptations. Thus, Turkish speakers typically adjust the pronunciation by introducing a vowel between the consonant clusters [g] and [r], leading to the eventual pronunciation of [gırafiti] (Beel & Felder, 2013). From this point of view, it is reasonable to suggest that Turkish and Khowar might demonstrate

similarities in how they handle consonant clusters. As analyzed both the languages have utilized the short vowel /ɪ/ to break the stop and liquid combination.

The ranking is represented as:

*[σ CC >> *[σ V >> DEP-IO >> *C]σ

- Violation of DEP-IO by Optimal Candidate: Ø →[ɪ]

Input: ɡ l ɑː s

↑

Output: ɡ ɪ. l ɑ s

(7) *fɪlm*

Tableau 7*: Ø →[fɪ̃ː]*

fɪlm	*CC]σ	*[σ V	*VORALN	DEP-V	*C]σ
a. fɪ.lɪm			*!	*	*
☞b. fɪ.lĩːm				*	
c. fɪlm	*!				

In numerous languages, vowels often undergo nasalization, especially in the same position where they are nasalized in English: before a tautosyllabic nasal stop. *VORALN claims that before a tautosyllabic nasal, vowels must not be oral. In Khowar when a vowel follows a nasal it becomes nasalized automatically. Therefore, this constraint *VORALN is ranked higher in Khowar. The lexical input [fɪlm] is mono as well as tautosyllabic. The candidates are generated by the GEN component of OT and are given in the OT tableau. The constraints are also set. The analysis begins with candidate ‘a’.

Candidate ‘a’ has a simple coda and the syllables begin with an onset. Hence the *CC]σ and *[σ V constraints are obeyed. However, it has an epenthetic oral vowel /ɪ/ that does not get nasalized when followed by a nasal stop ‘m’. Therefore, it is seriously violating the new *VORALN constraint. It is thus rejected to be an optimal candidate. Candidate ‘c’ is the most faithful non-epenthetic candidate, because it incurs no violation of the faithfulness constraint DEP-V. However, it has a cluster of consonants at the coda position. The sequence of the voiced approximant /l/ and the nasal /m/ clearly violates the

*CC]σ constraint, which demands the coda to be simple. To remain faithful to the DEP-V constraint is the main cause of the rejection of this candidate.

Hence, we are left with only one candidate that shows no violation of any of the highly ranked constraints. It is candidate 'b', that has an epenthetic vowel /ĩ:/ and that is nasalized as well as breaks the CC at the coda position. Therefore, it incurs no serious violation of any of the highly ranked constraints. It is worth noticing that coda clusters are often avoided in Pakistani languages like Saraiki (Atta et al., 2020) and Sindhi (Abbasi & Hussain, 2012). Therefore, such loanwords undergo certain modifications to be indigenized. The least ranked constraint DEP-V is violated but the violation is minimal. The DEP-V constraint must, nevertheless, be ranked low to allow maximum adjustment in the borrowed entities. It should be noted that the constraint *[σ V is satisfied by all candidates, but the constraint *C]σ is again violated by all. The optimal candidate takes two syllables and both of them have onset consonant, but the second syllable is closed i.e., it has a coda in the form of a consonant. It is the reason why *[σ V is ranked higher than C]σ in Khowar.

Abbasi and Hussain (2012) show the adjustment of this particular English loanword. It is adapted differently in Sindhi with the usage of double epenthesis. Thus, with the usage of epenthetic /ɪ/ and /ə/, film is pronounced as /fɪlɪmə/. In case of Urdu as highlighted by Farooq and Mahmood (2021), if a liquid consonant precedes a bilabial nasal phoneme /m/ epenthesis usually occurs. The combination of liquid + nasal is adapted in Pahari with the insertion of the /ə/ sound, for example, film /film/ is pronounced as /filəm/ (Abbasi et al., 2022). Therefore, it is noted that likewise Khowar, other Pakistani languages do not allow complex consonant clusters, and the liquid + nasal combination in loanwords is adjusted using epenthesis.

The ranking of constraint is represented as:

*CC]σ >> *[σ V >>*VORALN >> DEP-IO >> *C]σ

- Violation of DEP-IO by Optimal Candidate: Ø →[ɪ]

Input: f ɪ l m

↑

Output: f ɪ. l ĩ: m

4.5.2 Epenthesis of Vowel [è]

In the process of epenthesis, sound segments are inserted into a word. This is done to adjust a loanword and it makes the pronunciation easier. Vowel insertion plays a crucial role in loanword adaptation as it ensures that the borrowed word conforms to the phonotactics of the recipient language. Epenthesis clearly modifies the syllable structure of the borrowed word, allowing it to integrate smoothly into the sound system of the recipient language. Vowel Epenthesis is important as it breaks consonant clusters at different positions. Apart from the front high vowel /ɪ/, other vowels have also played their role in the adjustment of English loanwords in Khowar.

(8) ***Button***

***Tableau 8: Ø →*[è]**

[bʌtn]	NUC/V	*CC]σ	*[σ V	DEP-IO	IDENT-IO	*C]σ
a. bʌtn	*!	*				*
☞b. bɑ.tèn				*	*	*
c. bɑt.èn			*!		*	*

The constraint NUC/V claims that the head of the syllable must be a vowel. The phonotactic constraints of Khowar require syllables to consistently place a vowel as the nucleus or core element of the syllable structure. Therefore, the syllabic consonants are odd in Khowar, resulting in the higher ranking of the NUC/V constraint within its phonotactic rules. Jabeen et al. (2012) claim that Punjabi does not have a syllabic consonant as it must have a vowel at the peak of a syllable. Likewise Punjabi, each syllable in Khowar is accompanied by an integral vowel. Therefore, the syllabic consonant in the English loanwords is adjusted by inserting a short vowel as the analysis will further elucidate.

The faithful un-epenthetic candidate ‘a’ violates two highly ranked constraints. First, it contains a syllabic consonant. In linguistics, a syllabic consonant is a consonant sound that functions as the nucleus of a syllable. Unlike most consonants, which require a vowel sound to create a syllable, syllabic consonants are pronounced with enough sonority and length to form a syllable on their own. In English, the most common syllabic consonants are /l/, /m/, and /n/. Therefore, it violates the NUC/V constraint and Khowar requires all nuclei to be filled by a vowel. Secondly, it has a complex consonant cluster at

the coda position, again violating the *CC]σ constraint. It does not satisfy the top two higher-ranked constraints. Therefore, it cannot be an optimal one. Candidate ‘c’ satisfies the two highly ranked constraints that candidate ‘a’ violated. But it fatally violates another constraint *[σ V, because the second syllable begins without a consonant. It cannot be an optimal candidate either. Candidate ‘b’ is considered as the harmonic, hence, the optimal candidate. Its harmony is due to its satisfaction with the top three high-ranked constraints; its syllables contain nuclei in the form of vowels. Moreover, the syllables take onset, and the onsets are not even complex. Therefore, NUC/V, *CC]σ, and *[σ V are all satisfied. The DEP-V constraint is violated at the cost of satisfaction of *CC]σ.

It is worth noticing that although Khowar does not always require a coda it does not ban it. In OT terms, this indicates that other markedness and faithfulness constraints like MAX-IO and DEP-IO outweigh *CODA, which has a low ranking in Khowar. That is, if a coda is present in the source word, it is preserved, violating *CODA or *C]σ, and no phonological processes are involved to eliminate a coda. The *C]σ is violated by all the possible candidates as all contain a coda at the end specifically the second syllable of the optimal candidate ends with a coda.

Pahari and Khowar share some similarities in the adjustment of the consonant clusters. Pahari speakers encounter challenges with the pronunciation of stop + nasal clusters since these combinations are not commonly found in the Pahari language (Abbasi et al., 2022). As an illustration, the same English loanword /bʌtn/ is pronounced in Pahari as /betən/. Thus, it is observed that stop + nasal clusters do not occur at the coda position in most Pakistani languages. However, in Lasi this loanword is adjusted in a very different manner. According to Aliani (2022), the /n/ sound in Lasi is very rare. Therefore, when it occurs at the end of a loanword, it is often substituted with a retroflex /ɳ/. The loanword /bʌtn/ is adjusted as /bʌ.təɳə/ with the substitution of /n/ with /ɳ/ and epenthesis of vowel /ə/. In Khowar, only the process of epenthesis is used to adjust this particular loanword. Zaigham et al. (2022) claim that Urdu lacks consonant clusters, therefore, Urdu speakers find it really difficult to pronounce English words having syllabic consonants. The loanword /bʌtn/ is adjusted in Urdu as /bʌtən/. It is worth observing that Pakistani languages follow a similar pattern. Like Khowar, in Urdu, a vowel is only allowed to be the obligatory sound within a syllable. Khowar as well as Urdu speakers position a vowel before the syllabic consonant.

The ranking of constraint is represented as:

NUC/V, *CC]σ >> *[σ V >> DEP-IO >>IDENT-IO >> *C]σ

- Violation of DEP-IO by Optimal Candidate: Ø →[æ]

Input: b ʌ t n

↑

Output: b ɑ.t è n

4.5.3 Vowel Epenthesis at Different Positions

From s.no 1 to 6, the near-close front unrounded vowel [ɪ] has been inserted at different positions. In data no 1 and 2, [ɪ] has been inserted at the very start of the loanwords. In data.no 3, 4, and 5, [ɪ] vowel is added in between voiceless velar [k] and voiceless alveolar stop [l]. In s. no 6 [ɪ] has been added between voiced velar [g] and [l]. These additions affect the syllable-initial cluster.

Vowel sounds like [ĩː], and [è] have been added to break consonant clusters at the coda position of syllables from s.no 7 and 8. It is concluded according to the data analyzed that vowels are typically epenthesized in borrowed words often to break consonant clusters. It should also be noted that when epenthesis occurs it increases the syllable weight as well. Most of the loanwords above are monosyllabic. But when they are adjusted in Khowar, there is a change in their structure. They eventually become disyllabic or trisyllabic. For example, class /klɑːs/ is a monosyllabic English word. It enters Khowar and is adjusted according to the phonotactics of Khowar. As earlier mentioned, Khowar rarely allows CC, therefore it inserts vowel sounds to break the CC, eg., /klɑːs/ changes into /kɪ.lɑːs/. Additionally, consonant clusters i.e., /st, sk/ are resolved through prothesis while anaptyxis is used in clusters i.e. /sl, kl, gl/. So, in Khowar loanword adjustment, vowel insertion (epenthesis) is a common repair technique. Additionally, Khowar's phonotactic rules prohibit complex onsets or codas. Similarly, the obligatory vowels are permitted in syllable formation, while syllabic consonants are disallowed as per the language's phonotactic constraints.

4.6 Substitution

Another step in the loanword adaptation is substitution. Substitution is the process of replacing a sound segment of a prosodic word of a particular language with an alternate sound segment. According to Mahmood et al. (2011), substitution is a common propensity

to save sounds from deletion. It involves replacing a sound with phonetically close sounds in the receiving language (Hock, 1986). In this procedure, a phoneme from a foreign language is replaced with a phonetically or phonologically comparable native phoneme. Most languages throughout the globe use this procedure to simplify loanwords according to their native phonology. In Khowar, the substitution of phonemes includes both vowel and consonant substitution. Below are the transcribed English loanwords and their Khowar counterparts.

Table 8

Substitution used for Adjustment of English Loanwords

S.no	IPA Transcription	Khowar Transcription	Distance Value	Gloss	Phonemic Variation
1	mʌg	mɑk	1	Mug	/g/→[k], /ʌ/→[ɑ]
2	bæg	bek	2	Bag	/æ/→[e], /g/→[k]
3	rəʊd	rɔt	2	Road	/əʊ/→[ɔ], /d/→[t]
4	rekɔːd	rɪ.kɑːt	3	Record	/e/→[ɪ], /ɔː/→[ɑː], /d/→[t]
5	kɒlɪdʒ	kɑlɪtʃ	1	College	/ɒ/→[ʌ], /dʒ/→[tʃ]
6	bæŋk	bæ̃ŋk	1	Bank	/æ/→[æ̃]
7	rʌbər	rɑ.bʊł	3	Rubber	/ə/→[ɑ], /r/→[ɬ]
8	mɑːstər	meʃtèr	4	Master	/ɑː/→[e], /ə/→[è],/s//→[ʃ]
9	səˈluːt	sʊ.lʊt	2	Salute	/ə/→[ʊ], /uː/→[ʊ]
10	pəˈliːs	pʊlʊs	2	Police	/ə/→[ʊ], /iː/→[ʊ]
11	taɪm	tèm	1	Time	/aɪ/→[è]
12	fəʊtəʊ	fʊtʊ	2	Photo	/əʊ/→[ʊ], /əʊ/→[ʊ]
13	kəʊt	kɔt	1	Coat	/əʊ/→[ɒ]
14	dɒktər	dɑk.ʈʰɑːr	2	Doctor	/ɒ/→[ɑ], /ə/→[ɑː],
15	ˈhɒspɪtəl	hɑspɑt ɑːl	3	Hospital	/ɒː/→[ɑ], /ɪ/→[ɑ], /ə/ →[ɑː]
16	hɒstəl	hɑstèl	2	Hostel	/ ɒ / → [ɑ], /ə/ →[è]

(1) Mug

Tableau 9: / g / → [k], / ʌ / → [ɑ]

[mʌg]	NUC/V	*[σ V	*OBS VOI	IDENT-IO (Voice)
a./ mʌg /			*!	
☞**b. /mɑk /**				**
c. m.ʌk	*!	*!		*

According to Sipra (2013) when a language borrows words from another language, it makes an effort to incorporate them by using the sounds closest to the original sounds of the word it possesses. For example, Arabic does not have the /p/ sound therefore the English loanwords that have the /p/ sound are substituted with the nearest possible sound /b/ (Galal, 2004). Accordingly, the English loanword /stɒp/ is pronounced as /ʔistub/ in Arabic. Thus, in the process of substitution, a sound is replaced with a more suitable native sound. The examination will delve deeper into demonstrating the mechanics of substitution within Khowar.

The monosyllabic word [mʌg] serves as the input lexical item. The best possible candidates have made their way into the OT tableau. The competition of constraints will pick the best candidate. In the provided data, candidate 'b' is chosen as the winning one since it aligns harmoniously with all the prominently ranked markedness restrictions, NUC/V, *[σ V, and *OBS VOI. It has a vowel as its nucleus, which satisfies NUC/V. It ends with a sound segment /k/ that is voiceless velar, thus satisfying *OBS VOI. The optimal candidate ‘b’ has an onset, and the constraint *[σ V is satisfied. However, the faithfulness IDENT-IO (Voice) is breached on two occasions, but this violation is minimal. Since Khowar does not have the central mid vowel /ʌ/, therefore, it is substituted with the central low vowel /ɑ/. Then the voiced velar /g/ is replaced with voiceless velar /k/. This violation of IDENT-IO is just to satisfy the *OBS VOI constraint.

Continuing with the examination of candidate 'a', deemed the most faithful contender. Candidate ‘a’ fatally violates the strictly ranked markedness constraint *OBS VOI (no voiced obstruent in syllable coda) as it contains the voiced velar /g/. The voiced velar /g/ is a voiced obstruent. Candidate ‘c’ violates the NUC/V constraint as the velar /m/ stands alone to make a syllable. Though /m/ is a syllabic consonant and capable of making syllables without a vowel as a nucleus. While syllabic consonants can be part of

a syllable, they cannot form the opening syllable of a word. Therefore, the velar /m/ is violating the NUC/V. It has a second syllable that begins without an onset violating *[σ V. Finally, IDENT-IO (voice) is violated in all candidates except the faithful candidate ‘a’. Thus candidate ‘b’ is the optimal one and the process used is double substitution.

In the adaptation of loanwords, Lasi prefers the devoicing rule over the deletion of sound segments. If there is a voiced coda in the loanword, Lasi adjusts it by converting the voiced coda consonant to a voiceless one (Aliani, 2022). The word /pəˈreɪd/ is adjusted as /pəre.t/ in Lasi. Similarly, the voiced velar /g/ in the loanword is converted into voiceless velar /k/ in Khowar. The analysis further indicates that Khowar's phonotactic rules prefer a monosyllabic word to end with a voiceless consonant in its coda position.

The constraints are represented as:

NUC/V >> *[σ V, *OBS VOI >> IDENT-IO >> IDENT-IO (Voice)

- Violation of IDENT -IO by Optimal Candidate: / ɡ / → [k], / ʌ / → [ɑ]

Input: m ʌ ɡ

↓ ↓

Output: m ɑ k

(2) Bag

Tableau 10: /g/ → [k], /æ/→[e]

[bæg/]	NUC/V	*ə	*OBS VOI	IDENT-IO	*C]σ
a. /bæg/			*!		*
b. /bək /		*!		**	*
☞c. bek				**	*

Substitution is a technique in which sound segments are replaced or substituted with another sound segment. It is a repairing strategy to repair the illicit syllable structure in a language. The input given is the lexical item [bæg]. The OT tableau showcases the candidates generated in response to the given input. The analysis begins with candidate ‘a’. Upon analysis, it becomes evident that this candidate is not violating the faithfulness constraint, so it is better to assume it as a faithful candidate. The main constraint it is

disobeying is the *OBS VOI, as the syllable's final obstruent is the voiced velar /g/. Thus, it is rejected for an optimal candidate.

Secondly, the candidate 'b' begins with the voiced bilabial plosive /b/ and ends with the voiceless velar /k/. It meets the NUC/V and *OBS VOI, two highly rated markedness constraints. However, the newly added *ə constraint that disallows the occurrence of the schwa vowel in between consonants, is fatally violated. Thus, candidates 'a' and 'b' are fatally violating the highly ranked constraint and therefore cannot be the optimal candidates.

According to Kager (1999) "the satisfaction of lower-ranked constraints cannot compensate for the violation of higher-ranked constraints" (p. 22). Consequently, candidate 'c' remains the sole contender. Let us delve into an assessment of its suitability for an optimal candidate. Its syllable comprises a vowel as the nucleus. It initiates with an onset and culminates with a voiceless coda /k/. Moreover, it lacks the presence of /ə/ amidst its consonants. Therefore, NUC/V, *ə, and *OBS VOI are all satisfied. The IDENT-IO constraint is violated twice to satisfy *OBS VOI and *ə. The voiced obstruent /g/ is replaced with voiceless /k/ and the open front vowel /æ/ is replaced with front half open vowel /e/. Hence, IDENT-IO is violated to satisfy *OBS VOI. All the candidates possess closed syllables, thus *C]σ is violated by all.

In conclusion, the technique used to adapt English loanwords into Khowar is substitution. The voiced velar sound segment [g] has been replaced by the voiceless velar sound [k]. As discussed above syllables in Khowar often end with voiceless obstruent therefore *OBS VOI is ranked higher than all other constraints. Secondly, Khowar does not often take the /ə/ sound. Therefore, *ə and *OBS VOI are ranked higher than the faithfulness constraints but lower than the very highly ranked markedness constraint i.e., NUC/V and *CC]σ. Also, it is concluded that the monosyllabic word bag (CVC) remains the same when borrowed in Khowar (CVC) because substitution does not increase syllable weight.

The majority of the languages utilize the method of substitution. For instance, in Kitigania (spoken in Kenya), the absence of the voiced fricative 'z' results in its replacement with a voiceless fricative /s/ when encountered in loanwords. Devoicing sound segments through substitution is a phenomenon observed in languages such as Russian and German as well. In these languages, obstruents undergo devoicing at the final

position within words (Spencer, 2008). Likewise, as [θ] is not a part of Turkish phonetics, native Turkish speakers typically replace the unfamiliar sound [θ] with the more familiar [t] (Beel & Felder, 2013). Thus, Khowar like all these languages substitutes the sound segments that it does not seem fit to its phonological system.

The constraints are represented as:

NUC/V >> *ə >> *OBS VOI >> IDENT-IO >> *C]σ

- Violation of IDENT -IO by Optimal Candidate: / g / → [k]. / æ /→[e]

Input: b æ g

↓ ↓

Output: b e k

(3) Road

Tableau 11: /əʊ/ → [ɔ], / d / → [t]

[rəʊd]	NUC/C	*VV	*[σ V	*Voiced-Coda	IDENT-IO	*C]σ
rəʊd		*!		*!		*
rəʊt		*!			**	*
☞**rɔt**					**	*

English consists of eight diphthongs including /əʊ/. On the contrary, diphthongs are not included in the phoneme inventory of Khowar. According to Liljegren and Khan (2017), there are 41 consonants and five vowels in Khowar. However, Khowar does not often take any diphthongs and triphthongs within its syllables. The phonotactic constraints of Khowar do not allow it to take complex vowels within its syllables. The diphthongs in the borrowed words are adjusted with a simple vowel to comply with the phonotactic of Khowar. The newly added constraint *VV disfavors the occurrence of vowel sounds in a sequence. The analysis will elucidate the operational dynamics of the *VV constraint.

Candidates have been derived based on the input [rəʊd], a monosyllabic word. The constraints are given in the row of the OT tableau. The evaluation begins with candidate ‘a’. This candidate's syllable structure encompasses a nucleus and an onset, effectively meeting the criteria of the top two constraints. Furthermore, the voice feature remains

unaltered, signifying satisfaction of the IDENT-IO constraint. But it goes against the constraint *Voiced-Coda which is somehow a new version of the previously used constraint *OBS VOI. If there is an obstruent in the coda position it must not be voiced. Most of the monosyllabic words in Khowar often end with voiceless obstruent e.g., qɑf (paw), tɑt (father), tɪp (enormous). It cannot be generalized that Khowar always takes a voiceless obstruent in the coda position, but it is noticeable that voiceless obstruents are commonly favoured, particularly when it is a monosyllabic word. Therefore, the constraint *Voiced-Coda is violated. The newly added constraint is also violated as there is a sequence of vowels in between the two consonants of the syllable. The violations of *VV and *Voiced coda led to the dismissal of candidate 'a'.

The second candidate is likewise discarded for an optimal one. It disobeys the *VV constraint. The IDENT-IO-Voice is violated as the voiceless obstruent /t/ replaces the voiced obstruent /d/. Therefore, further deliberation on the optimality of this candidate becomes unnecessary. Thus, the analysis solidifies candidate 'c' as the most optimal choice. It incorporates a nucleus featuring a vowel and commences with an onset. The diphthong in the underlying input /əʊ/ is replaced with the short, open mid vowel /ɔ/. The final obstruent is devoiced. This comprehensive alteration ensures the fulfillment of the NUC/V, *VV, *[σ V, and *Voiced-Coda constraints.

In his book, Kager (1999) gives the concept of “Fallacy of perfection” which claims that “it is not possible for an output form to satisfy all the constraints” (p. 16). The winning candidate violates the last constraint IDENT-IO because the voiced plosive /d/ is replaced with the voiceless plosive /t/ and/əʊ/ is replaced by the short vowel the / ɔ /. These violations are minimal as IDENT-IO is a lower-ranked constraint. It was necessary to avoid IDENT-IO just to satisfy *VV and *Voiced Coda. Therefore, these violations have a lesser impact on the assessment of harmony. As usual the *C]σ constraint is violated by all candidates as all have closed syllables, and the constraint *[σ V is satisfied by all, as they possess consonants at the onset position. Therefore in the case of Khowar’s adaptation of loanwords *[σ V is always ranked higher than *C]σ.

Furthermore, in other Pakistani languages, the voiced /d/ in the loanwords is substituted with the voiceless /t/. In Lasi, a similar pattern emerges where speakers tend to favor /t/ over /d/. While the /d/ sound exists within the native inventory, it is not the preferred choice in pronunciation (Aliani, 2022). Lasi does not allow voiced stops at the

coda position. It does not delete but rather devoice it. For instance, in /pɪə.ri.əd/ the coda is devoiced as /pɪ.rət/ (Aliani, 2022). Hence, Khowar and Lassi share similarities in the adjustment of the English loanwords having voiced coda. Just like Khowar, /əʊ/ is repaired with a singleton phoneme in Punjabi. According to Karamat (2001), Punjabi lacks diphthongs. Mahmood et al. (2011) expressed the view that Punjabi substitutes English loanwords according to its phonotactics. The 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). The analysis of the data shows that Khowar phonotactics ban the occurrence of complex vowels within a syllable and the voiceless consonant at the coda position is often preferred.

The ranking is represented as:

NUC/V, *VV >> *[σ V, *Voiced-Coda >> IDENT-IO>> *C]σ

- Violation of IDENT -IO by Optimal Candidate: / əʊ / → [ɔ], / d / → [t]

Input: r əʊ d

↓ ↓

Output: r ɔ t

(4) Record

Tableau 12: / e / → [ɪ], /ɔː/ → [ɑː], /d/ → [t]

[rek.ɔːd]	*CC]σ	*[σ V	*OBS VOI	IDENT-IO (Voice)	IDENT-IO (Mid)	VOP	*C]σ
☞**a.rɪ.kɑːt**				*	*	*	*
b.re.kɔːd			*!			*	*
c. rek.ɔːrt	*!	*!		*	*	*	**

The voiced stop in many languages is changed into a voiceless counterpart during adjustment. This phenomenon is widely observed in both Russian and German languages (Ladefoged & Maddieson 2008). In Khowar as well, the voiced consonant in the coda position is often devoiced while adjusting the English loanword. A detailed analysis will provide further clarification and support for this assertion.

In the above data, the input given is the lexical item [rekɔːd], which is a disyllabic word. The candidates generated by the GEN component of OT have to compete with each other against the given constraints. The analysis begins with Candidate ‘a’, which has no serious violation of the highly ranked constraints. Its syllables begin and end with simple consonants and have vowels as the head. The second syllable ends with a voiceless coda. Therefore, all three top-ranked constraints are satisfied. Nonetheless, this candidate encounters violations in the lower-priority IDENT-IO constraints, as well as the least-ranked markedness constraints VOP and *C]σ. The constraint IDENT-IO (Voice) claims that the feature [voice] of an input segment must be preserved in its output correspondent. In the adjustment of the English loanword into Khowar the technique of coda devoicing has been used. The final voiced obstruent /d/ in the coda has been substituted by the voiceless obstruent /t/. It incurs a violation of IDENT-IO (Voice) but satisfies *OBS VOI. The replacement of the front middle vowel /e/ with the front high vowel /ɪ/ incurs a violation of the IDENT-IO(Mid) constraint. The context-free VOP constraint is violated because it demands that all obstruents in any position must be voiceless. In Khowar onset usually begins with a voiced obstruent for example báʊ (sheaf), bɔk (wife), dʊk (hillock), etc, therefore it is a least ranked constraint along with *C]σ in the case of Khowar.

The above input begins with an obstruent /r./. The "r" sound can be classified as either a sonorant or an obstruent, depending on its phonetic context. When "r" occurs after a vowel, as in the word "car", it is typically considered a sonorant. However, when "r" occurs at the beginning of a syllable or after a voiceless consonant, as in the words "right" or "park," it is typically considered an obstruent. Thus, /r/ in the input is obstruent. The VOP is violated by all candidates so is *CODA or *C]σ.

Since the input segments are still there in the output form, candidate 'b' is the most faithful one. It infringes the highly placed *OBS VOI. It is thus excluded for an optimal candidate. Candidate ‘c’ is the most disharmonic one as it violates the greatest number of constraints including the higher ranked markedness constraints *CC]σ and *[σ V. It is also eliminated as an optimal candidate. Derived from the analysis, it is evident that 'a' emerges as the optimal or winning candidate. The method employed for adapting the loanword involves a triple substitution process.

Similar to Khowar, the Lasi (a dialect of the Sindhi language) uses terminal devoicing to adjust the voiced coda. Lasi does not permit voiced codas or deletion, thereby

facilitating simpler pronunciation through the process of devoicing (Aliani, 2022). Both languages modify this specific loanword in a similar manner; for instance, /rekɔːd/ is adjusted as /rɪkɑːt/. Punjabi on the other hand does not devoice the final obtruent in rekɔːd but only changes the internal vowels. Thus, /rekɔːd/ is adjusted as /rəkaːd/ (Mahmood et al., 2011).

The constraint ranking is represented as:

NUC/V >> *[σ V, *OBS VOI >>IDENT-IO(Voice), IDENT-IO(Mid) >>VOP ,*C]σ

- Violation of IDENT -IO by Optimal Candidate: / e / → [ɪ], / ɔː / → [ɑː], / d / → [t]

Input: r e k ɔː d

↓ ↓ ↓

Output: r ɪ. k ɑː t

(5) College

Tableau 13: / ɒ / → [ɑ], / dʒ / → [tʃ]

[kɒlɪdʒ]	NUC /V	*CC]σ	*[σ V	*Voiced -Coda	MAX-V	IDENT-IO (Back)	IDENT-IO(Voice)	VOP	*C]σ
a. **kɒltʃ**		*!			*		*	*	*
b. kɒl.ɪdʒ			*	*!				*	*
☞**c. kɑ.lɪtʃ**						*	*		*

The tableau provided above illustrates the adaptation of the loanword [kɒlɪdʒ]. A comprehensive analysis is necessary to determine the optimal candidate. Starting with the assessment of the NUC/V constraint, it is apparent that all candidates conform to this constraint. This is because the candidates consist of either one or two syllables, with each syllable having a vowel as its nucleus. Moving on to the next salient constraint, *CC]σ, which requires the coda to be in a simple form. This condition is met by candidates 'b' and 'c', as they both adhere to the requirement, but candidate ‘a’ is fatally violating this constraint. If it is observed deeply, it becomes apparent that a consonant cluster resides in the coda position. The voiced lateral /l/ and the voiceless affricate /tʃ/ are sequenced,

leading to a violation of the *CC]σ constraint. Candidate ‘a’ is thus eliminated to be an optimal candidate.

The third constraint is *Voiced-Coda. It is important to bear in mind that Khowar commonly utilizes voiceless consonants in the coda position. It is similar to the Burmese language, if there is a coda obstruent in the loanword it is debuccalized to a glottal stop (Chang, 2009). As previously observed, English loanwords ending with voiced obstruents are replaced by a voiceless obstruent through the devoicing process. Thus *Voiced-Coda holds a relatively higher ranking. It is different from the constraint VOP that demands all the obstruents in any position to be voiceless. Therefore, *Voiced-Coda takes precedence in ranking, whereas the context-free VOP is positioned as the lower-ranked constraint in the context of Khowar. The *Voiced-Coda constraint is satisfied by candidates ‘a’ and ‘c’ but is violated by candidate ‘b’. Candidate 'b' is dismissed as an optimal choice due to the presence of the voiced affricate /dʒ/ in the coda position, which violates the *Voiced-Coda constraint. Additionally, it also breaches the *[σ V constraint, as the second syllable of candidate 'b' lacks an onset. Candidates 'a' and 'b' have each accumulated significant violations of the constraints that are ranked higher. Consequently, these candidates are excluded from consideration as optimal choices.

We have our winner that is candidate ‘c’. This particular candidate aligns harmoniously with all the prominently ranked constraints. It showcases a vowel as the nucleus of its syllables, features a simple coda structure, incorporates onsets in both syllables and concludes its coda with a voiceless sound. Hence, the winning candidate is unequivocally 'c'. However, it also shows violations of lesser rated constraints i.e., the IDENT-IO (Back) is violated because the back vowel /ɒ/ is replaced by the front /ɑ/ vowel. Then the IDENT-IO (Voice) is violated as the voiced affricate /dʒ/ is replaced by the voiceless affricate /tʃ/. But its harmony is not prevented by violations of these constraints because they are lowly ranked. The VOP is violated by the already rejected candidates. And the *C]σ constraint as usual is violated by all the generated candidates. In conclusion, 'c' is the best choice because it does not seriously violate any of the top-ranked constraints. The process involved in the adaptation of the loanword is double substitution. This same loanword is adapted in Burmese through a process known as debuccalization. The coda obstruent is debuccalized to a glottal stop. The word /kɒlɪdʒ/ is adjusted as /kɔ.leiˊʔ/ (Chang, 2009). The analysis further elucidates that Khowar does not

have the back vowel /ɒ/ in its phonemic inventory. Hence, loanwords containing this particular sound are replaced with the most similar sound available in Khowar.

The ranking can be represented as:

NUC/V, *CC]σ >>*[σ V, >>*Voiced-Coda >> IDENT-IO (Back), IDENT-IO (Voice) >>VOP >> *C]σ

- Violation of IDENT-IO by Optimal Candidate: / ɒ / → [ɑ], / dʒ / → [tʃ],

Input: k ɒ l ɪ dʒ

↓ ↓

Output: k ɑ. l ɪ tʃ

(6) Bank

Tableau 14: / æ / → [æ̃]

[bæŋk]	*VORALN	*OBS VOI	*VNASAL	IDENT-IO (Nasal)	*C]σ
a./ bæ**ŋ**k/	*!				*
☞**b./bæ̃ŋk/**			*	*	*
c. bæ̃ŋg /		*!	*	*	*

In the above data, there is an addition of a new constraint which is *VNASAL. It claims that vowels must not be nasal. When *VNASAL is undominated in a language, all of its vowels will be pronounced orally, irrespective of their lexical specification or their position in the syllable (whether before an oral or nasal consonant). Furthermore, in numerous Pakistani languages, there is a preference for nasalizing vowels exactly when a nasal consonant appears, particularly before a tautosyllabic nasal stop. Gill and Gleason (1969) claim that nasalized vowels are an important part of Punjabi phonology. An oral vowel shifts to a nasal vowel when it comes before a nasal consonant, or when it appears after a nasal consonant at the end, like in /nã/ ‘no’ (Gill & Gleason, 1969)

In the case of Khowar vowels become nasalized wherever they occur before the nasal consonant segment. So, there is a conflict between the two markedness constraints. But *VORALN dominates *VNASAL in the instance of Khowar, therefore *VORALN>>*VNASAL. It should be emphasized that whereas *VNASAL is a context-

free constraint, the *VORALN constraint is context-sensitive since it creates a connection between a vowel's nasality and a nasal stop.

The lexical item given as input is the loanword [bæŋk]. With candidates established and constraints delineated in the OT tableau, the assessment starts with candidate 'a'. This candidate, despite fulfilling other constraints, is discarded as an optimal choice due to its violation of the highly prioritized markedness constraint *VORALN. Similarly, candidate 'c' is not the best option since it gravely violates the *OBS VOI, a highly rated markedness constraint. This violation of the candidate occurs because the syllable of the candidate ends with voiced velar obstruent /g/.

Despite violating the three constraints candidate ‘b’ is picked as the optimal candidate because it exhibits no violation of the dominating markedness constraints. The principle of domination is strict: if a candidate violates a higher-ranked constraint, it is unequivocally excluded, irrespective of its relative well-formedness concerning any lower-ranked constraints The optimal candidate takes nasalized vowel /æ̃/ before a nasal consonant, and the syllable ends with a voiceless coda. Hence *VORALN and *OBS VOI are satisfied at the cost of violation of *VNASAL, IDENT-IO (Nasal). As usual the *C]σ constraint is violated by all the candidates because all of them end with a coda. It is concluded that vowels in Khowar become nasalized when followed by a nasal consonant. Moreover, the repairing strategy used to adjust the loanword is substitution. The ranking of constraints is:

*VORALN >> *OBS VOI >> *VNASAL, IDENT-IO (Nasal) >> *C]σ

- Violation of IDENT-IO by Optimal Candidate: / æ / → [æ̃],

Input: b æ ŋ k

↓

Output: b æ̃ ŋ k

(7) Rubber

Tableau 15: /ʌ/ → [ɑ], /ə/ → [ʊ], /r/ → [ɬ]

[rʌb.ər]	NUC/V	*[σ V	*ə	IDENT-Mid-Cen	IDENT-Place	*C]σ
☞**a./ rɑ.bʊɬ /**				*	*	*
b. / rʌb.ə(r) /		*!	*			**
c. / rʌ.bər /			*!			*

English loanwords often experience alterations. Whenever foreign words are borrowed, they invariably undergo phonetic adjustments (Sipra, 2013). There are undoubtedly foreign sounds that do not match the local phonetic habits, therefore they are adjusted as the above English loanword [rʌb.ər]. The GEN component generates a multitude of potential candidates, and from this pool, the most suitable ones are chosen to progress to the OT tableau based on a given input. These candidates are engaged in a competition against the given constraints. Upon closer examination of the candidates listed above, it becomes evident that each of them features vowels as their nucleus, thereby satisfying the NUC/V constraint. Turning to the second constraint, which necessitates the presence of an onset in each syllable, it is notable that all candidates except 'b' adhere to this requirement. Candidate 'b' deviates from this constraint by featuring a vowel at the start of its second syllable. This is a clear violation of the *[σ V constraint. The third and last of the highly ranked markedness constraints, *ə, is breached by candidates 'b' and 'c'. as both contain /ə/ in between consonants.

We have now got the optimal candidate that is ‘a’. Upon scrutinizing the remaining less prioritized constraints, it becomes evident that the optimal candidate exhibits only marginal breaches to constraints like IDENT-Mid-Cen and IDENT-Place. Both the mid-central vowels/ʌ/ and /ə/ are not included in the phonemic inventory of Khowar, therefore, they are substituted. One by the back close vowel /ʊ/ and the second by the back open vowel /ɑ/. The voiced approximant /r/ is replaced by the dark l /ɬ/. However, candidate ‘b’ and ‘c’ satisfy both the IDENT constraints. The *C]σ constraint that demands syllables to be open is violated by all the candidates.

These violations are minimal and do not count in OT except for a rare instance, where a candidate's optimality may depend on whether a lower-ranked constraint is satisfied or violated. Moreover, it can be observed that the onset-less second syllable of the underlying form is adjusted in the surface form. This is just to satisfy the *[σ V constraint as in Khowar syllables often take onset. It is another justification for why *[σ V is ranked higher than *C]σ. Finally, the process of triple substitution is used to adjust the English loanword into Khowar. The representation of the constraint hierarchy here is:

NUC/V>> *[σ V >>IDENT- Mid-Cen, IDENT-Place, >>*C]σ

- Violation of IDENT-IO by Optimal Candidate: /ʌ/ → [ɑ], / ə / → [ʊ], / r / → [ɬ]

Input: r ʌ b. ə r

↓ ↓↓

Output: r ɑ. b ʊ ɬ

(8) Master

Tableau 16: /ɑ:/→ [e], /s/ → [ʃ], /ə/ →[è]

[mɑ:.stə(r)]	*CC	*[σ V	*ə	IDENT -Back	IDENT Central	IDENT Manner	*C]σ
a. /mɑ:st. èr /	*!	*			*	*	**
b. / mɑ:.stər /	*!		*!				*
c. ☞/meʃ.tèr /				*	*	*	**

The provided input consists of the disyllabic lexical item [mɑ:stər]. With candidates generated and constraints established, the process involves selecting the optimal candidate through a comprehensive evaluation against the defined constraints. The analysis starts with the assessment of the first constraint. This particular constraint holds immense significance due to its high ranking and the stipulation it enforces: that codas or onsets should not be complex. This *CC constraint is violated by candidate ‘a’ as well as candidate ‘b’. The first syllable of candidate ‘a’ has a cluster of the voiceless fricative /s/ and voiced stop /t/. Similarly, candidate 'b' features the same sequence of clusters repeated in the second syllable. Given that Khowar seldom permits CC structures, both candidates 'a' and 'b' are eliminated from consideration.

The *[σ V constraint is violated by candidate ‘a’ because the second syllable starts with a vowel. The constraint *ə prohibits the inclusion of the schwa /ə/ between consonants. In the context of Khowar, the utilization of /ə/ is infrequent, whereas it is prominent in English. Rarely any word may take /ə/ but for this study it is considered that the use of /ə/ is trivial in Khowar. The most faithful candidate ‘b’ takes /ə/ in the second syllable therefore it is the most dis-harmonic candidate.

The best choice then is candidate ‘c’ since it meets the higher-ranking requirements and violates the lower-ranking constraints. The open back vowel /ɑː/ is replaced by the half-open front vowel /e/. Then the central vowel /ə/ is substituted by the vowel /è/ (grave accented). There is another substitution and this time it is a consonant. The voiceless fricative /s/ is substituted by another voiceless fricative /ʃ/. Therefore, all the IDENT-IO constraints are violated by the optimal candidate. The onset-less second syllable of the underlying form is adjusted through re-syllabification in the surface form. This re-syllabification was necessary to avoid violation of *[σ V. The *C]σ constraint is again violated by all the candidates. It is concluded that the optimal candidate is candidate ‘c’ and the process used for the adaptation of the loanword is triple substitution.

Replacing /s/ with /ʃ/ is a prevalent strategy in Lasi. Consequently, English loanwords having /s/ are often incorporated using /ʃ/ instead of /s/ (Aliani, 2022). Hence, the same loanword /mɑːstər/ is adapted as /mɑːʃ.tər/ in Lassi. In both languages /s/ has been replaced with /ʃ/.

The ranking of constraints will be:

*CC]σ >> ONS, *ə >> IDENT-Back , IDENT-Height, IDENT-Manner >>*C]σ

- Violation of IDENT-IO by Optimal Candidate: /ɑː/→ [e], /s/ → [ʃ], /ə/ →[è]

Input: m ɑː.s t ə r

↓ ↓ ↓

Output: m e ʃ. t è r

(9) Salute

Tableau 17: / ə / → [ʊ], / u: / → [ʊ]

[sə.luːt]	*[σ CC	*ə	*OBS VOI	IDENT -Central	IDENT -Length	IDENT - Voi	*C]σ
☞**a. / sʊ.lʊt** /				*	*		*
b. / sə.luːt /		*!					*
c. / sluːt /	*!						*
d.sʊ.luːd			*!	*		*	*

The most crucial function of the generator, which is a key component of OT, is to produce an unlimited number of possible candidates. Possible means that should not be illicit. Let us consider the input provided in the tableau above to illustrate this point. There are many possible candidates like [sʊl], [sʊlʊ], [lʊt], [ʊlʊt] and so on. GEN avoids creating any illicit candidates like [sltlʊ] or [slttʊ] etc. In OT the candidates that make their way into the tableau are the best possible candidates for any given input. Subsequently, these candidates within the tableau engage in a competition, vying to be chosen as the optimal candidate.

Through a systematic analysis of the candidates in relation to the provided constraints, the optimal candidate can be identified. The constraint *[σ CC requires that the onset be simple. Candidates 'a', 'b', and ‘d’ adhere to this constraint, each commencing with a simple consonant (onset). In contrast, candidate 'c' violates it due to the presence of a cluster consisting of the voiceless fricative /s/ and the voiced lateral /l/. Consequently, candidate 'c' is eliminated from contention for the role of an optimal candidate.

Moving on to the next constraint, *ə, it becomes evident that all potential candidates align with this constraint, with the exception of the most faithful candidate 'b'. Despite its close resemblance to the input, candidate 'b' is not considered an optimal candidate due to its breach of the *ə constraint, which disallows the presence of the schwa /ə/ between consonants. While /ə/ is rarely found in Khowar words, the *ə constraint remains highly prioritized. Any transgression of this constraint leads to the dismissal of a candidate, as is the case with candidate 'b'. In Turkish as well this particular sound does not exist, thus they replace it according to their phonotactics. Beel and Felder (2013) conducted a research study where they worked on the phonological adaptation of English

loanwords in Turkish. They found that in Turkish this particular sound /ə/ does not exist, thus they replace it accordingly.

Subsequently, we come to the contextually bound *OBS VOI constraint, which enforces that the obstruent in the coda must be voiceless. In Khowar, mostly the syllables in the coda take voiceless consonants however, it cannot be the highest ranked constraint as NUC/V or *[σ CC, etc. Nevertheless, all candidates, except candidate 'd', conform to this constraint. In the case of candidate 'd', the second syllable ends with a voiced coda obstruent, resulting in its exclusion from contention based on this violation. The only candidate that incurs no violation of any of these highly ranked markedness constraints is ‘a’. Consequently, it is the best choice.

Additionally, both the preferred candidate and the rejected candidates violate the low-ranked faithful and markedness constraints. The central /ə/ vowel is replaced with the back, close (high) vowel /ʊ/ in candidate ‘a’ and ‘d’. The long vowel uː is replaced by the short vowel /ʊ/ in candidate ‘a’. The voiceless plosive /t/ is replaced by the voiced plosive /d/ in candidate /d/. Then, *C] σ (No Coda) is violated by all the candidates. It is important to note that these violations are relatively minor and do not significantly impact the candidate's optimality. It is concluded that the optimal candidate is ‘a’ and the process used for adjustment of loanword is double substitution. Just like Khowar, in the Turkish adaptation of English loanwords [kəltʃər], the /ə/ is replaced with /ʊ/. For example, the word [kəltʃəɹ] is pronounced as [kʊltür] (Beel & Felder, 2013).

The ranking of constraint is represented as:

*[σ CC >> *ə, *OBS VOI >> IDENT-Central, IDENT-Length, IDENT- Voice >> *C] σ

- Violation of IDENT-IO by Optimal Candidate: / ə / → [ʊ], / uː / → [ʊ]

Input: s ə' l uː t

↓ ↓

Output: s ʊ. l ʊ t

(10) Police

Tableau 18: / ə / → [ʊ], / iː / → [ʊ]

[pəˈliːs]	*[σ CC	*ə	MAX-V	IDENT-Central	IDENT-Length	*C]σ
☞**a. /pʊ.lʊs /**				*	*	*
b. / pə.liːs /		*!				*
c. / pliːs /	*!		*			

Similar constraints are applied for the analysis of this data. With the exception of 'c', all candidates comprise two syllables with vowels as their nuclei. The candidate ‘b’ disobeys the highly rated *ə constraint as the first syllable ends with a schwa /ə/. This infraction leads to the dismissal of the otherwise most faithful candidate. The subsequent candidate 'c' displays a cluster of consonants at the onset of the syllable, thus signifying a definite breach of the *[σ CC constraint.

Candidate 'a' emerges as the sole contender that satisfies all the highly ranked markedness constraints. Its syllables are characterized by vowels as their nuclei, it begins with simple onsets satisfying *[σ CC. The vowel /ə/ is strategically avoided between consonants to adhere to the *ə constraint. Thus, the optimal candidate is ‘a’.

It is time to examine the ideal candidate's and the other contenders' violations of the lower-ranked constraints. The IDENT-Central constraint is violated because the central vowel /ə/ is replaced with the back close vowel /ʊ/. Secondly the long vowel in the input /iː/ is replaced with a short vowel / ʊ/. Then, candidate ‘c’ violates the MAX-C constraint because the /ə/ is not substituted rather it is removed, to satisfy *ə. The very low ranked constraint *C] σ is violated by all the candidates. These violations are minimal and of no greater significance. Moreover, the repairing strategy used to adjust the loanword is double substitution. Pashto also uses a double substitution strategy to adjust this loanword. During adjustment of the English loanword /pəliːs/ in Pashto, the high back rounded vowel /ʊ/ replaces the short vowel schwa /ə/, while the high front unrounded /ɪ/ replaces the English long vowel /iː/ (Iqbal & Ullah, 2023). Pashto and Khowar both adapt English loanwords in comparable ways, given their close linguistic relationship.

The ranking of constraints is:

*[σ CC >> *ə >> MAX-V >> IDENT-Central, IDENT-Length, >> *C]σ

- Violation of IDENT-IO by Optimal Candidate: / ə / → [ʊ], / iː / → [ʊ]

Input: p ə. l iː s

↓ ↓

Output: p ʊ. l ʊ s

(11) Time

Tableau 19: / aɪ / → [è]

[taɪm]	NUC/V	*VV	*[σ V	IDENT-IO	*C]σ
a. / ta.ɪm/			*!		*
b. / taɪm /		*!			*
☞**c. / tèm /**				*	*

According to Zivenge (2009), a syllable is considered to have a complex peak when the nuclear sound is a diphthong or a triphthong rather than a pure vowel. More than one V element can be found in the complex peaks. On the other hand, the simple peaks are those with only one vowel in the nuclear. The English language allows for both simple and complex peaks in syllables. Conversely, Khowar often allows for a simple peak (CVC) specifically when the syllable is closed. Therefore, the English loanwords having complex vowels as peak such as diphthongs or triphthongs in a closed syllable are modified when integrated into Khowar. In many Pakistani languages for example in Punjabi glide epenthesis is used to avoid complex vowels in a syllable (Habib, Naeem & Bhatti, 2021). While in Khowar substitution is used to avoid complex vowels VV. The analysis will further solidify this claim.

The lexical item given as an input is the monosyllabic word [taɪm]. It contains a VV structure as a syllable peak. The candidates generated are the best possible candidates that have entered the tableau. Within this tableau, a contest ensues among these candidates to determine their optimality. The scrutiny of these candidates against the constraints will ultimately reveal the optimal candidate. We initiate our analysis with the NUC/V constraint. Both onset and coda are optional parts of a syllable, but the nucleus is compulsory therefore NUC/V is fulfilled by all candidates as all have syllables that take vowels as their head component. The *VV constraint comes into focus, which inherently

discourages the occurrence of consecutive vowel sequences. In Khowar, the exploration of diphthongs has not been extensively studied. A significant study conducted by Liljegren and Khan notably omits the consideration of diphthongs in the Khowar language. According to them, Khowar possesses no such diphthongs therefore the anti-diphthong constraint *VV is ranked higher. However, this study claims that Khowar does not take the sequence of vowels in a syllable when it is closed. The candidate that violates this constraint is ‘b’, as there is a sequence of the vowels in-between the onset and coda.

The *[σ V constraint demands a syllable not to begin with a vowel. Nevertheless, this constraint suffers a severe breach in the case of candidate 'a', while it remains fulfilled by all other candidates. Drawing from the analysis of these three top-ranked constraints, candidate 'c' emerges as the optimal choice. It remains free from any significant violation of the highly prioritized constraints. It features a vowel as the nucleus, boasts an onset, and avoids consecutive vowel sequences between consonants. Thus, the constraints NUC/V, *VV, and *[σV are all agreed by this candidate.

It however incurs minimal violation of the IDENT-IO constraint as the sequence of vowels in input VV is adjusted with the close vowel /è/. As usual, the constraint *C]σ is violated by all candidates as all of these have consonants at the coda position and have closed syllables. Consequently, it is determined that candidate 'b' is the optimal candidate, and that candidate 'c' is the obedient or faithful one.

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 /taː.jam/ (Alhoody, 2019). Likewise, Khowar’s phonotactics does not permit the occurrence of vowels in between syllables, therefore, substitute the complex vowels in a loanword into a simple one.

The ranking of constraints is represented as:

NUC/V >> *VV >> *[σ V >> MAX-C >> IDENT-IO, >> *C]σ

- Violation of IDENT-IO by Optimal Candidate: / aɪ / → [è]

Input: t aɪ m

↓

Output: t è m

(12) Photo

Tableau 20: / əʊ / → [ʊ], / əʊ / → [ʊ]

[fəʊ.təʊ]	*VV	*[σ V	IDENT-IO	*C]σ
a. / fəʊ.təʊ /	*!*!			
☞**b. /fʊ.tʊ /**			*	
c fəʊt.ʊ	*!	*!	*	*

Khowar simplifies the diphthongs in English loanwords. This is because Khowar does not have diphthongs in its phonemic inventory. Other Pakistani languages also do not have diphthongs in their inventory. As noted by Khan (1997) and Khurshid et al. (2003), in contrast to English, Urdu does not possess diphthongs and triphthongs. Certain sources on Punjabi phonology, such as Bhatia (2008) and Gill & Gleason (1962), assert the existence of diphthongs in Punjabi, while others, like Karamat (2001), do not include diphthongs in the inventory of Punjabi vowels. Consequently, Hussain et al. (2011) indicate that the phoneme /o:/ is frequently employed as a substitution for the English diphthong /əʊ/. Like these languages, Khowar replaces diphthongs found in loanwords with a single vowel. The analysis will provide a more comprehensive explanation.

The lexical item that is given as input is [fəʊtəʊ] which is a disyllabic word. The analysis begins with the first candidate ‘a’. Despite satisfying all the constraints this faithful candidate is violating the *VV constraint twice. Both syllables take the sequence of vowels that causes the elimination of this candidate. Candidate ‘c’ is the most disharmonic one as all the highly and lowly ranked constraints are violated by it. It has a sequence of vowels and an onset-less second syllable. The vowel /ʊ/ substitutes the diphthongs and finally the first syllable has a coda. Therefore, there is not a single chance to declare it as the winning candidate.

Only one candidate remains that adheres to all of these highly ranked constraints. The candidate is ‘b’, and it is declared as the victorious candidate. Its syllables take simple vowels, the onsets are not complex and there is no sequence of vowels in any of its syllables. Therefore *VV and *[σ V are satisfied. However, the lower-ranked constraints are violated by these candidates. The IDENT-IO constraint is fatally violated by all except the faithful candidate ‘a’. The diphthongs /əʊ/ in both syllables of input are substituted by the back close short vowel /ʊ/ as is observed in the case of candidate ‘b’. In candidate ‘c’ the /əʊ/ in the second syllable is replaced by a short vowel. Although *C]σ constraint is satisfied by all candidates except ‘c’, still it cannot be regarded as a higher-ranked constraint because it demands that syllables should be opened all the time. It is concluded that the optimal candidate is ‘b’ and the process of double substitution is used for the adjustment of the English loanword.

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. Khowar replaces the diphthong in the same manner as Yoruba, as examined above. 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 /oː/. Hence, there is an anticipation that English vowels like /əʊ/ would correspond to their closest phonological match in Qassimi Arabic, often [oː]. The word /gəʊl/ is adjusted as [goːl] with the substitution of a diphthong with a monophthong (Alhoody, 2019).

The ranking of constraint is represented as:

*VV, *[σ V >> IDENT-IO>> *C]σ

- Violation of IDENT-IO by Optimal Candidate: / əʊ / → [ʊ], / əʊ / → [ʊ],

Input: f əʊ. t əʊ

↓ ↓

Output: f ʊ. t ʊ

(13) Coat

Tableau 21: / əʊ / → [ɔ]

[kəʊt]	*VV	*OBS VOI	IDENT-IO	IDENT-IO-Voice
a. / kɔd /		*!	*	*
b. / kəʊt /	*!			
☞**c. / kɔt /**			*	

The nucleus of every syllable is occupied by a vowel, which can be either simple or complex. English permits the presence of complex vowels within a syllable, although such occurrences are limited in Khowar due to its phonotactic constraints. Diphthongs are exceptionally rare in Khowar, while the notion of triphthongs is not relevant to Khowar language. Such complex vowels in English loanwords are simplified using certain adaptation techniques. According to Atta et al. (2020), the Saraiki speakers substitute diphthongs in English loanwords like /əʊ/, and /ei/ with long vowels like /ɔ:/ and /e:/. For example, the term [keik] is altered by substituting the diphthong with the elongated vowel [ke:k]. In Khowar, both long and short vowels are employed to replace diphthongs from English loanwords. A more in-depth analysis of the data will provide further clarity on how intricate vowels are streamlined in the Khowar language.

The lexical item that is given as input is [kəʊt]. It is a monosyllabic word. Following this, the generator has produced a collection of candidates that have been presented in the OT tableau. Subsequently, the task falls upon the EVAL component to assess these candidates considering the constraints and identify the most optimal choice. By assessing the candidates against the established constraints, the winning candidate will be chosen. As usual, the analysis begins with the first candidate ‘a’. It meets the *VV requirement, yet the following *OBS VOI constraint is breached. The syllable ends with a voiced stop /d/. This clear violation is the reason for discarding the first candidate. The second candidate proves to be the faithful one. It satisfies almost all the constraints except *VV. There is a sequence of vowels in between two voiceless plosives /k/ and /t/ that show a clear violation of *VV. As a result, this candidate is declined.

With candidate 'c' now being the sole candidate, let us thoroughly evaluate it in relation to the two top-rated markedness constraints. There is no sequence of vowels in between consonants, thus *VV is satisfied. The syllable is closed, which means that there

exists a coda at the end. The coda takes a voiceless obstruent therefore the constraint *OBS VOI is also satisfied. The candidate 'c' is selected as the optimal one since it doesn't violate these highly ranked limitations.

However, the optimal candidate 'c' and candidate 'a both exhibit violations of the faithfulness constraint IDENT-IO. The sequence of the vowel in the input /əʊ/ is substituted with a short, back, rounded vowel /ɔ/ by both candidates. The IDENT-IO-Voice constraint is violated by candidate ‘a’ as there is a replacement of voiceless /t/ with voiced /d/. Therefore, it can be deduced that candidate 'b' is the most faithful among the candidates, whereas candidate 'c' is considered the optimal choice. The adaptation process of the English loanword [kəʊt] involves substitution.

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). This very 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. Yorùbá, spoken in Southwestern Nigeria also disallows the occurrence of complex diphthongs. The word /kəʊt/ is adjusted with the substitution of /əʊ/ with /o/ (Oyinloye, 2020). It is adjusted as /kóòtù/in Yorùbá. Likewise, the diphthong /əʊ/ is absent in Qassimi Arabic, therefore the word /kəʊt/ is adjusted as [koːt] (Alhoody, 2019). The same is the case with Khowar where diphthongs are often adjusted using simple short vowels while Saraiki as mentioned above often uses long vowels as a substitution for diphthongs.

The ranking can be represented as:

*VV >>*OBS VOI >> IDENT-IO, IDENT-IO-Voice

- Violation of IDENT-IO by Optimal Candidate: / əʊ / → [ɔ]

Input: k əʊ t

↓

Output: k ɔ t

(14) Doctor

Tableau 22: / ɒ / → [ɑ], / ə / → [ɑː]

[dɒk.tər]	*CC]σ	*[σ V	*ə	IDENT-IO-Back	IDENT-IO-Central	*C]σ
☞**a./dɑk.ʈʰɑːr/**				*	*	*
b. / dɒk.tər/			*!			*
c. /dɒkt.ɑːr/	*!	*!			*	*

The input given is the disyllabic word [dɒk.tər]. The analysis begins with the first constraint *CC]. It asserts that if a syllable contains a coda, it should be simple. Both candidate 'a' and candidate 'b' adhere to this requirement, while candidate 'c' violates it. Candidate ‘c’ has a sequence of consonant clusters in the form of a voiceless plosive /k/ and another voiceless plosive /t/ in the first syllable. Consequently, it is disregarded as a potential optimal candidate.

Next is the constraint *[σ V that requires a syllable to begin with a consonant. The leading two candidates conform to this constraint, while the previously dismissed candidate 'c' once again demonstrates a breach of the highly ranked *[σ V, as its second syllable commences with a vowel. The competition is intensifying, and the pivotal choice of designating an optimal candidate now rests upon the ultimate markedness constraint *ə. This constraint disallows the syllable to take the vowel schwa /ə/ in between consonants. Among the contenders, candidate 'b' breaches this constraint, as its last syllable takes /ə/ in between two consonants /t/ and /r/. The other two candidates satisfy it. It has now become obvious that the winning candidate is ‘a’. It has a vowel as the head of the nucleus in both its syllables, the coda is not complex as well and the /ə/ is replaced, hence it satisfies all the top constraints.

Moreover, the faithfulness constraints are violated by candidates ‘a’ and ‘c’ except the faithful candidate ‘b’. Candidate ‘a’, the winner candidate violates IDENT-IO-Back because the back open vowel /ɒ/ is replaced by the central vowel /ɑ/. Then the central vowel /ə/ is replaced by the open vowel /ɑː/. It shows a violation of IDENT-IO-Central. The same constraint IDENT-IO-Central is again violated by candidate ‘c’. The *C]σ constraint is violated by all candidates however these violations are not serious or fatal. It

is concluded that candidate ‘a’ is optimal. The process of adaptation involves double substitution.

Khowar and Pashto share similarities in the adjustment of this particular loanword. In the word /dɒktər/, the substitution occurs by replacing the English short vowel /ɒ/ with the low back unrounded vowel /ɑ/, the short vowel schwa /ə/ with the low central unrounded vowel /a/. Thus, the loanword /dɒktər/ is adjusted as /dɑkṭar/ in Pashto (Iqbal & Ullah, 2023). The only difference is that Khowar makes the stop /t/ aspirated. Beel and Felder (2013) claim that Turkish does not have the /ə/ sound. Therefore, they replace it according to their phonotactics. In Khowar, it is preferred to refrain from using /ə/ and instead replace it with the nearest sound present in the native phonology. Similarly, the /ɒ/ sound is absent in the inventory of Khowar, therefore it is replaced by the nearest possible sound.

The ranking of constraint is represented as:

*CC]σ >> *ə >>IDENT-IO-Back, IDENT-IO-Central >> *C]σ

- Violation of IDENT-IO by Optimal Candidate: / ɒ / → [ɑ], / ə / → [ɑː]

Input: d ɒ k. t ə r

↓ ↓

Output: d ɑ k. ʈʰ ɑː r

(15) Hospital

Tableau 23: / ɑː / → [ɑ], / ɪ / → [ɑ], / ə / → [ɑː]

hɑː.spɪ.ʈəl	*CC]σ	*ə	PARSE-C	IDENT -back	IDENT- front	IDENT - Cen	*C]σ
a.hɑs.pɑ.tɑː.l			*!	*	*	*	***
☞**b.hɑs.pɑ.tɑːl**				*	*	*	**
c. hɑː.spɪ.ʈəl	*!	*!					*

The underlying form is given, and upon scrutinizing the candidates, it becomes apparent that candidate 'a' is discarded due to a critical breach of the more prioritized PARSE-C constraint, which has been recently introduced. It claims that a consonant must be parsed into a syllable (Kiparsky, 2003). The /l/ is a syllabic consonant and takes no vowel to make a syllable. It stands alone and therefore violates the PARSE-

C constraint. Candidate ‘a’ satisfies all other higher-ranked constraints like *CC]σ, *[σ V, and *ə. Candidate ‘c’ is the faithful one, but it violates the *CC]σ constraint. The second syllable of candidate ‘c’ begins with the sequence of fricative /s/ and plosive /p/. It similarly violates another highly ranked *ə constraint as the third syllable takes the central vowel /ə/ also known as schwa.

The winning candidate then is ‘b’. It satisfies all the highly ranked constraints. The syllables have taken simple consonants, the syllable does not have /ə/ in between, and each consonant is parsed into a syllable. Hence all the constraints are satisfied. Khowar often places markedness constraints above faithfulness constraints as a loanword does not enter the language as it is, rather they are modified or adjusted. Therefore, markedness constraints are ranked above the faithful ones.

In the above data, the winning candidate agrees with all the highly-ranked markedness constraints but violates the lower-ranked faithfulness constraints. The analysis elucidates in detail how these violations occur. The input has the back rounded vowel /ɒ/. It is substituted with the central unrounded vowel /ɑ/, thus a violation of IDENT-back. Again /ɑ/ substitutes the front high vowel /ɪ/, violating IDENT-front. The central vowel /ə/ in the last syllable is adjusted with the open unrounded vowel /ɑː/. It can then be said that the optimal candidate does not mean that it will show no violation of any of the constraints. It actually violates different constraints, but the violation should be minimal. The technique of adjustment used in the process is substitution which has happened thrice.

Same as Khowar, Qassimi Arabic does not have the /ə/ vowel (Alhoody, 2019). Therefore, the English vowel /ə/ is adapted regularly as /a/. The loanword /ˈkeɪ.bəl/ is adjusted with the substitution of /ə/ vowel. It is adjusted as [keː.bal]. Beel and Felder (2013) claim that Turkish also does not have the /ə/ sound. Therefore, they replace it according to their phonotactics. The ranking of constraints is represented as:

*CC]σ >>,*ə >> PARSE-C >> IDENT-back, IDENT-front, IDENT- Cen >> *C]σ

- Violation of IDENT-IO by Optimal Candidate:

/ ɑː / → [ɑ], / ɪ / → [ɑ], / ə / → [ɑː]

Input: h ɑː. s p ɪ. ʈ ə l

↓ ↓ ↓

Output: h ɑ s. p ɑ. t ɑː l

(16) Hostel

Tableau 24: /ə/ →[è], / ɒ / → [ɑ]

hɒs.təl	NUC/V	*ə	*NASV	IDENT place	CONTIGUITY
☞**a.hɑs.tèl**				*	*
b.hɑ̃s.tèl			*!	*	*
c.hɒs.təl		*!			

In Khowar, the constraint NUC/V consistently holds a higher rank. The head of a syllable in Khowar is always a vowel according to Khowar phonotactics. Therefore candidates ‘a’, ‘b’, and ‘c’ show no violation of this constraint. The next constraint holds significant importance, as it will inevitably lead to the elimination of one of the candidates. It can be observed that candidate ‘a’ and ‘b’ have avoided the mid-central vowel /ə/ in between their syllables. Therefore, they are loyal to it, however, the last candidate has taken the /ə/ in between consonants in the second syllable. As a result of this grave breach of the constraint, candidate 'c' is the first to be disqualified.

Moving forward to the last markedness constraint *NASV that demands vowels must not be nasal followed by any consonant except any nasal like /n/, /m/ etc. If we observe candidate ‘b’ it has vowels as head on both syllables. It satisfies the NUC/V constraint and *ə. However, it violates *NASV as it has an open-back unrounded vowel /ɑ̃/ that has been nasalized followed by the voiceless fricative /s/. Therefore, it is rejected as an optimal candidate. Likewise, there is a substitution of a sound segment. The open, back, rounded vowel /ɒ/ has been replaced by the open, back, unrounded vowel being nasalized. This is a violation of IDENT/place.

At this point, only one candidate remains, that does not pose a substantial challenge to any of the constraints ranked higher and agrees to all of them. It is candidate ‘a’ that incurs no violation of the highly ranked markedness constraints. Though it violates IDENTplace and CONTIGUITY, these violations are minimal. The optimal candidate violates the lower-ranked constraint merely to adhere to the higher-ranked constraints. Consequently, it is concluded that 'a' represents the optimal candidate, whereas 'c' is the most faithful candidate. The process of adaptation involved is double substitution.

The ranking of constraint is:

NUC/V, >> *ə >> *NASV >> DEP-V, IDENT place >> CONTIGUITY

- Violation of DEP-IO and IDENT-IO by Optimal Candidate:

/ə/ →[è],

/ ɒ / → [ɑ]

Input: h ɒ s .t ə l
↓ ↓
Output: h ɑ s. t è l

4.7 Deletion

During the adaptation of English loanwords in Khowar, certain sound segments might undergo omission. This process is known as elision or deletion. The phonological process of deletion entails eliminating one or more sound segments from a word. Sound segments may experience omission at various positions within a word. Therefore, deletion serves as yet another nativization strategy employed to adjust complex onsets and codas in loanwords. A clear violation of MAX-IO occurs when any segment is deleted, as this constraint requires that each segment in the input has a corresponding counterpart in the output. It is worth noting that deletion of sound segments is not as commonly employed as other repairing strategies like epenthesis and substitution in the case of Khowar loanword adaptation. Mahmood et al. (2011) also conclude that deletion is the least adaptation strategy employed by Punjabi speakers. The data analysis will show the mechanism of deletion in Khowar.

Table 9
Deletion of Sound Segment While Adaptation

S.no	IPA Transcription	Khowar	Distance Value	Gloss	Phonemic Transcription
1	sɪˈment	sɪˈmet	1	Cement	n → [Ø]

(1) Cement

***Tableau 25:* n →[Ø]**

[sɪ.ment]	*CC]σ	*NC0	*[σ V	MAX-IO	*C]σ
☞a.sɪ.met				*	*
b.sɪ.ment	*!	*			*
c. sɪm.et			*!	*	*

The lexical item given as input is the disyllabic word cement. The tableau shows that the process of deletion has affected the coda consonant rather than the onset consonant. To avoid the cluster at the coda the velar /n/ sound has been deleted. In the Korean language just like in Khowar, complex clusters are not allowed especially at the coda position (Boersma & Hamann, 2009). Therefore, to satisfy the Korean structural restrictions a sound segment is deleted. The same is the case with Khowar as it will be obvious after analyzing this data through the lens of OT.

The nasal /n/ and voiceless obstruent /t/ are present in candidate 'b'. Both of the top-ranked markedness constraints, *CC]σ and *NC0, are evidently breached. The *NC0 constraint demands that a nasal sound should not be followed by a voiceless obstruent. As a result of this violation, the candidate is rejected. Candidate 'c' conforms to the two constraints that were violated by candidate 'b'. Nonetheless, candidate 'c' encounters a breach of the *[σ V constraint, which asserts that "a syllable should initiate with an onset." This violation is attributed to the candidate 'c' second syllable, which starts with the vowel /e/. Because candidate 'a' remains free from violations of the highest-ranked constraints, we may thus infer that it is the best candidate. Its second syllable takes a simple coda, there is no sequence of the velar /n/ and the plosive /t/, and the syllables begin with a consonant. Therefore, all the constraints are satisfied.

The violation is on the faithfulness constraint MAX-IO that claims, “Input segments must have output correspondents” (Kager, 1999, p. 102). The nasal /n/ sound is deleted to adjust the loanword. The result shows that when nasal and obstruent are involved either obstruent or the nasal is deleted. It is determined that candidate "b" is the

most faithful while candidate "a" is the optimal one. The process involved in the adjustment of the loanword is deletion.

Native Turkish speakers encounter difficulty in pronouncing words that end with /nt/ cluster. The nasal + stop combination is not allowed in Turkish therefore the process of deletion is applied to adjust such loanwords that have the /nt/ combination (Beel & Felder, 2013). The study of Beel and Felder (2013) reports that Turkish speakers modify the loanword "apartment" from its original pronunciation [əpɑɹtmɛnt] to [ɑpɹtmɑn] by entirely omitting the final [t]. The coda clusters in Khowar and Turkish are either epenthesized or deleted. The phonotactic constraints of Khowar do not allow the nasal+stop sequence to make a cluster in a syllable.

The ranking of constraint is represented as:

*CC]σ >> *NC0, *[σ V >>MAX-IO

- Violation of MAX-IO by Optimal Candidate:

n →[Ø],

Input: s ɪˈ m e n t

↓

Output: s ɪ. m e t

4.8 Epenthesis and Substitution

In the adjustment of a single loanword, two or more processes can be involved. In table 10 there is a list of the English loanwords where the two most important repairing strategies are used. Epenthesis involves the insertion of a sound segment while substitution entails the replacement of a sound segment with the nearest possible segments in the recipient language. It can be observed that one process is used twice like double substitution or double epenthesis, single epenthesis double substitution, etc as in the case of the word bottle where there is insertion of a single vowel sound, but substitution happens twice. So, in the adjustment of the following loanwords, two or more processes are used.

Table 10

Epenthesis and Substitution of Sound Segment While Adjustment

S.no	IPA Transcription	Khowar	Distance Value	Gloss	Phonemic Variation
1	brʌʃ	bʊ.ɾʊʃ	2	Brush	Ø → [ʊ], / ʌ / → [ʊ]
2	plæstɪk	pɑ.lɑs.tɪk	2	Plastic	Ø→[ɑ],/æ/→[ɑ],/s/→[ʃ]
3	bɒtl	bʊ.θa:l	3	Bottle	Ø→[ɑ:],/ɒ/→[ʊ],/t/→[θ]
4	pleɪt	pɪ.let	2	Plate	Ø →[ɪ], / eɪ / → [e]
5	bɒks	bɑ.kɑs	2	Box	Ø → [ɑ], / ɒ / → [ɑ]
6	draɪvər	dɪ.raɪ.vær	2	Driver	Ø → [ɪ], / ə / → [æ]
7	sleɪt	sɪ.let	2	Slate	Ø → [ɪ], / eɪ / → [e]
8	slɪpər	sɪ.lɪ.pèr	2	Slipper	Ø → [ɪ], / ə / → [è]
9	skaʊt	ɪs.kɔt	2	Scout	Ø → [ɪ], / aʊ / → [ɔ]
10	bʌlb	bɑ.lɑp	2	Bulb	Ø→[ɑ],/b/→[p],./ʌ/→[ɑ]

(1) Brush

Tableau 26: Ø → [ʊ], /ʌ/ → [ʊ]

[brʌʃ]	*[σ CC	*[σ V	MAX-IO	DEP-IO	IDENT-IO
a. ☞ /bʊ.ɾʊʃ/				*	*
b. / bʊɾ. ʊʃ /		*!	*	*	*
c. /brʌʃ/	*!				

Two adaptation processes also known as repair strategies are in action to adjust the English loanword [brʌʃ] into Khowar. The analysis of the given input will disclose what are those processes and how they act to adjust a loanword. Candidates generated against the given input are displayed on the OT tableau. The candidate ‘a’ aligns with the highest-ranked markedness constraints since its syllables are straightforward and have vowels as their nucleus. However, candidate 'b' breaches the *[σ V constraint due to the opening of its second syllable with the high, rounded vowel /ʊ/. This particular violation leads to the rejection of candidate 'b'.

Candidate ‘c’ is also rejected because it violates the markedness constraint *[σ CC. There is a sequence of voiced bilabial /b/ and voiced post-alveolar /r/. This sequence violates the constraint's requirement and results in the rejection of candidate 'c'. According to Saidat (2010), the structure of an English syllable can be represented by the formula: (C)(C)(C)V(C)(C)(C)(C), indicating that English allows a maximum of three consonant clusters at the beginning (onset) and up to four consonants at the end (coda) of a syllable. This sequence of consonants is not permitted in the phonotactics of Khowar, therefore causing the rejection of candidate ‘c’. After competing with these potential candidates, candidate ‘a’ comes out to be the winner, as it maintains a harmonious alignment with all the constraints ranked higher. The syllables of candidate ‘a’ have a nucleus in the form of a vowel, and they begin with consonants. Additionally, the complex cluster is broken, therefore, constraints like *[σ CC, and *[σ V are all satisfied.

The optimal candidate violates the faithfulness constraints DEP-V. The insertion of the unrounded vowel /ʊ/ violates the DEP-V, just to satisfy *[σ CC. The IDENT-IO constraint is likewise violated because the central vowel /ʌ/ is substituted with the back, unrounded vowel /ʊ/. These violations do not affect the optimality of the candidate. Hence, it is concluded that candidate ‘c’ is the most faithful candidate and ‘a’ is the optimal one. The adaptation processes involved in the adjustment are substitution and epenthesis.

Dupoux et al. (1999) state that the Japanese language does not permit consonant clusters and handles them by inserting a vowel between the consonants to break the cluster. Similarly, many Pakistani languages do not permit the cluster of consonants (Habib & Khan, 2019; Atta et al., 2020), but Pahari permits no more than two consonants in both positions (Khan, 2012). Khowar like many other regional Pakistani languages bans the occurrence of consonant clusters at either position. Therefore, the loanword /brʌʃ/ is adjusted by declusterizing the onset consonant cluster.

The ranking of constraints is represented as:

*[σ CC >> *[σ V>> MAX-IO, DEP-IO

- Violation of DEP-IO and IDENT-IO by Optimal Candidate:

Ø →[ʊ],

/ʌ/ → [ʊ]

Input: b r ʌ ʃ

↑ ↓

Output: b ʊ. ɾ ʊ ʃ

(2) Plastic

Tableau 27: Ø → [ɑ], / æ / → [ɑ], /s/ → [ʃ]

[plæs.tɪk]	*[σ CC	ONS	CONTIGUITY	DEP-V	IDENT-IO
☞a. /pɑ. lɑʃ. tɪk/			*	*	**
b. / pɑl.ɑs. tɪk/		*!	*	*	*
c. / plæs.tɪk /	*!				

In Khowar the voiceless bilabial plosive /p/ does not usually take any other consonant in the onset position except the alveolar approximant dark /ɬ/, as in the words like pɬik (all). Therefore, the consonant cluster of bilabial /p/ and approximant clear /l/ is illicit in Khowar's phonotactics, and it has been adjusted by the epenthetic, open, unrounded vowel /ɑ/. There are substitutions of sound segments as well. The near-open, front, unrounded vowel /æ/ has been replaced by another open unrounded vowel /ɑ/. Then there is another substitution of the voiceless alveolar /s/ with the un-voiced alveo-palatal /ʃ/.

If we observe the candidates generated by GEN against the available and language-specific constraints, then we can conclude that candidate 'a' is a clear winner. The syllables in candidate 'a' start with an onset, satisfying the ONSET constraint. Then the epenthetic vowel /ɑ/ is breaking the initial consonant sounds of /p/ and /l/. Thus, satisfies another higher ranked *[σCC constraint. However, the lower-ranked CONTIGUITY, DEP-V, and IDENT-IO are violated by the optimal candidate. According to CONTIGUITY, components that are nearby in the input must also be adjacent in the output. but there is a clear violation of this constraint as the segments in the input have been distorted.

The IDENT-IO is violated by the optimal candidate as there is a substitution of the vowel /æ/ and the consonant /s/. Candidate 'b' fatally violates the higher-ranked ONSET constraint and minimally violates all other lower-ranked constraints. Candidate

'c' is eliminated from contention as the preferred candidate due to its infringement of the prominent *[CC restriction. It is important to emphasize that even though candidate 'c' meets all other criteria, it cannot be selected as the optimal candidate. In Optimality Theory (OT), compromising a highly ranked constraint in favor of satisfying other constraints is not permissible. Therefore, candidate ‘a’ is a potentially optimal candidate. The processes involved in the adjustment of the loanword are double substitution and deletion.

In Pashto, the English loanword /plæs.tık/ undergoes a similar adjustment as in Khowar, although the consonant cluster remains unchanged. The sound /ɑ/, which is a low back rounded vowel, substitutes the English short vowel /æ/. Additionally, the dental stop and voiceless consonant /t/ take the place of the English alveolar plosive /t/, and the high front tense unrounded vowel /i/ replaces the English short vowel /ɪ/ (Iqbal & Ullah, 2023). Many African languages ban the consonant clusters at the word's initial position. Oluoch (2014) claims that Dholuo (a language spoken in Kenya) follows a CVC syllable pattern. He examined the process of nativizing loanwords in Dholuo and found that the most commonly used methods of adaptation involve the insertion of additional sounds (epenthesis). This strategy is frequently employed in Dholuo when incorporating words with Consonant Consonant (CC) structures, regardless of whether they occur in the initial, middle, or final syllables.

This ranking of constraint can be represented as:

*[σ CC >> ONS, >>CONTIGUITY, DEP-V, >>IDENT-IO

- Violation of DEP-IO and IDENT-IO by Optimal Candidate:

Ø →[ɑ],
/ æ / → [ɑ], /s/ → [ʃ]

Input: p l æ s. t ɪ k
↑ ↓↓
Output: p ɑ. l ɑ ʃ. t ɪ k

(3) Bottle

Tableau 28: Ø → [ɑ:], / ɒ / → [ʊ], /t/ → [θ]

bɒt.l	NUC/V	*CC]σ	*[σ V	MAX-V	DEP-IO	IDENT-IO	*C]σ
a.bθɑ:l		*!		*	*	*	*
☞bʊ.θɑ:l					*	**	*
c.bɒt.l	*!	*					**

The input given is the disyllabic word [bɒt.l]. Bottle contains a syllabic consonant. A syllabic consonant is a consonant sound that functions as the nucleus of a syllable without the need for a vowel. Such syllabic consonants cannot be found in the phonotactics of Khowar. Therefore, there should be a constraint that avoids such illicit structure of sound segments of the loanword to adjust it into Khowar. NUC/V serves this purpose, and it claims that the head of a syllable must be a vowel, and in Khowar, every syllable contains a vowel. Hence NUC/V is the highest-ranked constraint. As we also know Khowar rarely allows complex consonant clusters at the onset and coda position of a syllable. For example, if there is a word that begins with the voiced bilabial /b/ it always takes a vowel next to it except the alveolar approximant dark /ɬ/ or approximant /r/. Other than these two /b/ does not take any other consonants and these two consonant sounds happen very rarely with /b/ in Khowar. Therefore, consonant clusters in the loanwords are often adjusted through epenthesis, especially through vowel epenthesis.

The *CC]σ constraint is ranked higher in Khowar. Khowar has both open and closed syllables therefore *C]σ is the least ranked constraint. In Khowar, the closed syllables keep themselves simple. It simply means that syllables that are closed do not take consonant clusters at the coda position. Thus, the constraints are ranked accordingly, and the NUC/V, *CC]σ, and *[σ V are higher-ranked constraints. An examination of these constraints in relation to the provided candidates will facilitate the selection of the most optimal candidate that adheres to these ranking preferences.

In the above-given data candidate ‘a’ is clearly violating the *CC]σ constraint as there is a CC cluster at the syllable onset position. The bilabial plosive /b/ is immediately followed by the voiceless fricative /θ/. It is also disobeying all the remaining lower-ranked constraints. Therefore, it is rejected as an optimal candidate.

Candidate ‘b’ has a double substitution, the back open vowel /ɒ/which is absent in the phonemic inventory of Khowar, has been replaced by the black close /ʊ/ vowel. Secondly, there is a substitution of a voiceless alveolar consonant /t/ with a voiceless dental fricative /θ/. The violation of the faithfulness constraint IDENT-IO is evident in this case. To resolve the consonant cluster at the coda position, there is an insertion of a long vowel /ɑ:/, leading to a breach of another constraint, DEP-IO. The second syllable ends with a coda thus *C]σ is also violated. However, these violations are minimal. No higher-ranked constraint is violated by candidate ‘b’, Both its syllables contain a vowel as their head, the second syllable takes a simple coda, and both the syllables begin with a consonant or onset. Therefore, it is an optimal candidate. If we analyze candidate ‘c’ the syllabic consonant /l/ functions as the nucleus of a syllable without the need for a vowel. It violates NUC/V. Hence it cannot be chosen as the optimal one. Candidate ‘b’ is the winning candidate and candidate ‘c’ is the faithful candidate. Moreover, the processes used to adjust the English loanword are epenthesis and double substitution.

The adaptation of this specific loanword into Pashto aligns closely with how it is adapted in Khowar. In Pashto the word /bɒtl/ displays a replacement of the English short sound /ɒ/ with the short mid-back rounded vowel /ɔ/, along with the addition of the low central unrounded /ɑ/. Thus, /bɒtl/ changes into /bɔtɑl/ (Iqbal & Ullah, 2023). The adjustment process in both languages is quite similar, as neither language permits the syllabic consonant to form the syllable and both languages alter the /ɒ/ vowel to the closest available sound.

The ranking of constraints can be represented here as:

NUC/V, *CC]σ >> *[σ V >> MAX-IO >> DEP-IO >> IDENT-IO, >> *C]σ

- Violation of DEP-IO and IDENT-IO by Optimal Candidate:

Ø →[ɑ:],
/ ɒ / → [ʊ], /t/ → [θ]

Input: b ɒ t. l
↓ ↑
Output: b ʊ.θ ɑ: l

(4) Plate

Tableau 29: Ø →[ɪ], / eɪ / → [e]

pleɪt	NUC/V	*[σ CC	*VV	*[σ V	DEP-V	IDENT-IO	*[i]	*C]σ
a. pɪl.et				*!	*	*	*	*
b. pleɪt		*!	*!					*
☞c. pɪ.let					*	*	*	*

As compared to English, Khowar does not have diphthongs. In Khowar, English diphthongs are replaced by a single phoneme when adapted. The analysis will show how the loanwords having complex vowels are adjusted in Khowar.

The monosyllabic word [pleɪt] has been provided as the lexical item for analysis. The candidates are given in the OT tableau's column and the constraints are given in the row. If we analyze the above data, it becomes evident that the syllables in each of the candidates adhere to the NUC/V constraint, which requires a vowel as the nucleus of a syllable. Each syllable has taken a vowel as the nucleus and head of the syllable. The next constraint *[σ CC is satisfied by candidate 'a' and candidate 'c' but is violated by candidate 'b', the faithful one. At this point, we have a compelling reason to discard candidate 'b' due to its significant breach of the highly ranked constraint *[σ CC]. There is a cluster of consonants as the voiceless plosive /p/ is followed by voiceless lateral /l/.

Next is the final highly ranked markedness constraint *VV. The *VV constraint disallows the occurrence of vowel sequence in a syllable. Khowar does not often use diphthongs or sequences of vowels. Based on this *VV is ranked higher in Khowar and later we will see how the sequence of vowels (diphthongs) in the loanwords are adjusted in Khowar. The *VV constraint is violated by the most faithful candidate as it keeps the sequence of vowels /eɪ/ in between consonants. Therefore, candidate 'b' incurs violations of the higher-ranked constraints. The sequence of vowels is adjusted by replacing it with the short, front vowel /e/ in both candidates, 'a' and 'c'.

The next constraint *[σ V is very crucial as it will decide which one is the winner among candidates 'a' and 'c'. The first syllable in each candidate satisfies this constraint because both begin with an onset. However, the second syllable of candidate 'a' takes a vowel to begin with, while candidate 'c' takes onset in both its syllables. That is the

optimal candidate is decided, and it is candidate ‘c’. It is concluded that candidate 'b' is the most faithful candidate, while candidate 'c' emerges as the optimal choice. The repairing strategy used to adjust the loanword is substitution and epenthesis.

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). Thus, Khowar shows similarity with these languages in the adjustment of diphthongs.

The ranking of constraints is as follows:

NUC/V, *[σ CC >> *VV, *[σ V >> DEP-V >> IDENT-IO >> *[i], *C]σ

- Violation of DEP-IO and IDENT-IO by Optimal Candidate:

Ø →[ɪ],

/ eɪ / → [e]

Input: p l eɪ t

↑ ↓

Output: p ɪ.l e t

(5) Box

Tableau 30: Ø → [ɑ], / ɒ / → [ɑ]

bɒks	*CC]σ	*[σ V	IDENT-IO	DEP-V	*C]σ
a.bɒk.ɑs		*!		*	**
☞**b. bɑ. k ɑ s**			*	*	*
c.bɒks	*!				*

The input given is the monosyllabic word [bɒks]. Many words in English end with the [ks] sound, for example, box, fox, and wax but Khowar does not allow this pattern of /k/ and /s/ in a sequence. The complex consonant cluster of the loanword is adjusted in Khowar with an insertion of an open-back unrounded vowel /ɑ/**.** Many languages of the world do not allow coda clusters, like Punjabi (Habib & Khan, 2019). In Urdu, when a consonant precedes an alveolar fricative consonant /s/ or /z/, short vowel epenthesis takes

place to avoid consonant clusters (Farooq & Mahmood, 2021). Likewise, Khowar also prohibits syllable's coda cluster. When a sound doesn't exist in the recipient language, it gets adjusted to the nearest sound available. In Punjabi and Urdu, for instance, where /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). The analysis will show the replacement of the vowel /ɒ/ and the breaking of the consonant cluster in Khowar.

The candidate 'a' shows a serious violation of the constraint *[σ V. The second syllable begins with a vowel. It is the only candidate that is violating the onset constraint. Therefore, 'a' is rejected as an optimal candidate. Now, if we analyze candidate 'c', it is the faithful, non-epenthetic, loyal candidate. No sound segment is inserted, deleted, or substituted. Yet again, it cannot be an optimal candidate because the markedness constraint in the adjustment of loanwords in Khowar is ranked higher than the faithfulness constraint. Hence, in the hierarchy of constraints, *CC]σ takes precedence over DEP-V and IDENT-R. Violating a higher-ranked constraint to fulfil a lower-ranked one is not permissible within the framework of Optimality Theory (Kager, 1999). The *CC]σ is violated by candidate 'c' as there is a sequence of voiced velar /k/ and the voiceless fricative /s/ at the end of the syllable. Hence, 'c' is also eliminated.

We have then the winning candidate which is 'b'. If it is observed closely, it violates constraints, but these sorts of violations cannot be counted as the constraints are ranked lower. DEP-V is violated by the optimal candidate because there is an inclusion of vowel /ɑ/ in between the consonant clusters at the coda position. Then, the rounded /ɒ/ vowel that is absent in Khowar, is replaced by the unrounded /ɑ/. Therefore, a clear violation of the IDENT constraint. To comply with the higher-ranked markedness constraint, these constraints are violated. The final constraint, *C]σ is violated by all the candidates. Thus, it is concluded that 'c' is the most faithful candidate while 'b' is the optimal one. The processes involved in the adjustment of the loanword are substitution and epenthesis.

Regarding the consonant cluster at the coda position, many research studies have been conducted on whether languages allow coda clusters. Kambuziya and Hashemi (2011) worked on the Russian loanword adaptation in Persian. Despite the distinctiveness of the source languages, Russian and English, a common feature is that both allow CC at

the onset as well as coda positions. In Persian, the presence of CC structures in syllables constitutes a serious breach. Consequently, Persian utilizes epenthesis as a corrective measure to rectify the prohibited coda clusters found in Russian loanwords (Hashemi, 2011). Khowar as observed in the analyzed data, typically restricts consonant clusters as Persian does. Therefore, there is a necessity to establish a connection between the Persian adaptation of Russian loanwords and the Khowar adaptation of English loanwords. Both languages prohibit consonantal clusters. The ranking of constraint is represented as:

*CC]σ>> *[σ V >> DEP-V >> IDENT-R >> *C]σ

- Violation of DEP-IO and IDENT-IO by Optimal Candidate:

Ø → [ɑ],

/ ɒ / → [ɑ]

Input: b ɒ k s

↓ ↑

Output: b ɑ k ɑ s

(6) Slate

Tableau 31: Ø → [ɪ], / eɪ / → [e]

sleɪt	NUC/V	*[σ CC	*[σ V	*VV	IDENT-IO	DEP-V	*C]σ
☞**a. sɪ.let**					*	*	*
b. sɪl.et			*!		*	*	*
c.sleɪt		*!		*!			*

As observed Khowar has no word that begins with the voiceless fricative /s/ and voiceless plosive /k/, there is no sequence of /sk/ in Khowar's initial syllable of a word. Therefore, the English words like school and store in the above data have taken epenthetic vowel /ɪ/ at the word initial position. Likewise, there is no sequence of voiceless fricative /s/ and voiced lateral /l/ at the word's initial syllable in Khowar. Therefore, the consonant cluster in the English loanword 'slate' is adjusted using certain repairing strategies. Bengali also does not have word-initial consonant clusters; therefore, vowel epenthesis is used to break such clusters (Karim, 2010).

If we analyze the possible candidates against the given constraints, we can observe that 'a' is the winning candidate amongst all candidates. It satisfies all the highly ranked

language-specific constraints. To avoid the consonant cluster that is prohibited in Khowar's phonotactics, vowel /ɪ/ has been inserted to break the word-initial CC thus it satisfies *[σ CC. The insertion of vowels has increased the weight of the syllable, the monosyllabic English word has become disyllabic, and each syllable has a nucleus where vowels are the head of all those syllables. It satisfies the NUC/V constraint. Also, each syllable begins with an onset, satisfying the *[σ V constraint. The sequence of vowels occurring in between the consonants is adjusted by replacing it with the front vowel /e/. However, the faithfulness constraint DEP-V is violated as usual because of the insertion of a vowel, and IDENT-IO is violated as the sequence of vowels is substituted with a short front vowel. However, these violations are necessary for the well-formedness of the output candidate. The lowest ranked constraint *C]σ is violated as the second syllable is closed with a consonant.

It can be asserted that in Khowar when there is a sequence of obstruent and liquid, vowel epenthesis occurs cluster internally, but when there is obstruent + stop at syllable initial position, epenthesis occurs cluster externally. In Bengali vowel epenthesis occurs in the same manner. "When the words start with obstruent and resonant, the vowel insertion occurs in between obstruent and resonant. And when the words start with obstruent [s] followed by a stop, then epenthesis occurs word-initially" (Karim, 2010, p.2). 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). Likewise Bengali and Pashto, Khowar uses the technique of substitution and epenthesis for the adjustment of loanwords.

The repair strategies in action are substitution and epenthesis. The ranking can be:

NUC, *[σ CC >> *[σ V, *VV >> MAX-IO >> DEP-V >> *C]σ

- Violation of DEP-IO and IDENT-IO by Optimal Candidate:

Ø → [ɪ],

/ eɪ / → [e]

Input: s l eɪ t

↑ ↓

Output: s ɪ. l e t

(7) Slipper

Tableau 32: Ø → [ɪ], / ə / → [è]

slɪp.ər	NUC/V	*[σ CC	ONSET	IDENT-Mid	*I	*C]σ
a. sl.ɪpèr	*!	*	*	*	*	*
☞**b**. sɪ.lɪ.pèr				*	*	*
c. slɪp.ər		*!	*!		*	*

As already discussed, Khowar does not allow the combination of /s/ and /l/ in word initial position. Therefore, the input has been adjusted using two repairing techniques. They are vowel epenthesis and vowel substitution. Zaigham et al. (2022) highlight that initial combinations of consonants are exceptionally uncommon in Urdu, so much so that officially, they are considered non-existent. Most often, Urdu allows vowel sounds to separate words into syllables. Similar to Urdu, Khowar allows the insertion of vowels to break the consonant clusters. The analysis will explain further.

In the analysis of candidate ‘a’ against the constraints, we can observe that it violates all the constraints, therefore it is the most disharmonic candidate. The NUC/V is violated as the sequence of [sl] trying to make a syllable without taking any vowel and it is also a violation of *[σ CC. The second syllable begins without an onset and hence violates ONSET/*[σ V. Other lower-ranked faithfulness constraints are additionally violated.

Now if we analyze another non-optimal, non-epenthetic, and faithful candidate ‘c’, it violates the highly ranked markedness constraint *[σ CC. The syllable begins with the consonant cluster at the onset. It also violates the ONSET/*[σ V constraint because the second syllable begins with the central vowel or schwa. Consequently, it is dismissed as the optimal choice. The rest of the constraints except NUC/V and *[σ CC are violated also.

Finally, it is time to examine the winning candidate, ‘b’. It satisfies the NUC/V constraints as each syllable begins with a vowel as its head. By adding an epenthetic vowel /ɪ/, it avoids the complicated consonant clusters. Each syllable begins with an onset satisfying the ONSET constraint. Thus, it is the ideal candidate among all. The lower-ranked markedness constraints are violated by the optimal candidate. For example, the

mid-central unrounded vowel /ə/ in the input has been replaced by the front unrounded vowel /è/. 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.

The constraint *ɪ claims that no /ɪ/ should be inserted in between consonants. In Khowar, as analyzed above insertion of /ɪ/ is the most common technique to break consonant clusters specifically at the onset position. Therefore, *ɪ is violated also. The lowest of all ranked constraints *C]σ is violated by all the possible candidates as each of the candidate's syllables ends with a consonant and are closed syllables. An additional rationale for the higher ranking of *[σ V over *C]σ becomes apparent in this context. The onset-less second syllable of the underlying form is adjusted by taking an onset in the surface form. This is just to satisfy *[σ V, but the *C]σ is violated once again. Finally, 'b' is the best candidate since it satisfies all the highly rated constraints, while 'c' is the most faithful candidate.

The syllable structure in Kitigania (a language spoken in Kenya) is straightforward. In Kitigania, syllables lack complex margins (Muriira, 2017). If there is a sequence of consonants in a syllable onset, epenthesis is used to make it compatible with the phonological system of the language receiving the loanword. The loanword slipper is adjusted in Kitigania with the insertion of a sound segment to break the consonant cluster. Thus, /slɪpər/ becomes /cɪlɪβacɪ/. The reason to bring Kitigania into the discussion is that likewise Khowar, it uses /ɪ/ to break consonant clusters. The CC syllable structure is banned in both languages.

The ranking of constraints is:

NUC/V, *[σ CC, *[σ V >>IDENT-Mid, *ɪ >>*C]σ

- Violation of DEP-IO and IDENT -IO by Optimal Candidate:

Ø → [ɪ],

/ ə / → [è]

Input: s l ɪ p. ə r

↑ ↓

Output: s ɪ. l ɪ.p è r

(8) Scout

Tableau 33: Ø → [ɪ], / aʊ / → [ɔ]

skaʊt	*[σ CC	*VV	CONTIGUITY	IDENT-IO	*ɪ	*C]σ
☞a.ɪs.kɔt				*	*	*
b.skaʊt	*!	*!				*
c.sɪ.kɔt			*!	*	*	*

In Khowar s + obstruent is not very common since there are no words in Khowar that begin with /s/+/k/ sequence. Therefore, such words as analyzed earlier are adjusted using the epenthesis of a vowel. In these instances, epenthesis typically takes place externally to the consonant cluster rather than internally. As the sonority of s + obstruent is falling, epenthesis at the edge is both feasible and preferred. According to Broselow (1983), there exists a distinctive quality in s-obstruent clusters, specifically in their structure, setting them apart from other clusters. S-obstruent clusters are intricate sound combinations that prove challenging to be disrupted by the insertion of additional sounds (epenthesis). In her argument, she contends that s-stop clusters are extraordinary in that they resist internal epenthesis. In the context of Khowar, it is indeed the case that, when there is an s + stop combination in the loanword, epenthesis occurs externally as observed previously. Furthermore, English loanwords containing diphthongs and other segmental elements typically undergo a process of monophthongization in an attempt to assimilate into the Khowar vocabulary. This analysis further substantiates these assertions.

Within the provided data, three potential candidates emerge, engaging in a competition against the presented constraints to establish themselves as the optimal choice. The candidate ‘b’ is the faithful one. However, it faces elimination due to its breaches of the *[σ CC and *VV constraints. While it successfully adheres to all other constraints, it falls short of becoming the optimal selection. There is a tough competition between candidates ‘a’ and ‘c’. Both are satisfying the highly ranked *[σ CC and *VV constraints. They both violate the low-ranked faithfulness constraint IDENT-IO, as the diphthong in the input is replaced by the open and round vowel /ɔ/. Furthermore, both candidates exhibit a violation of the *C]σ constraint. The *ɪ is violated differently in these candidates. In ‘a’ the vowel /ɪ/ is added before the cluster and in candidate ‘c’ it is added in between the consonants.

As analyzed before in Khowar when there is s + obstruent at the word's initial position, epenthesis occurs at the edge just before the consonant clusters. The final decision comes from the faithfulness constraint CONTIGUITY. It states that segments that are adjacent in the input should also remain adjacent in the output (McCarthy & Prince 1994). Candidate 'a' satisfies the CONTIGUITY constraint. Based on the CONTIGUITY candidate 'a' is chosen as optimal and the winning candidate. Thus, it is concluded that candidate 'a' is the optimal one while 'b' is the most faithful one. The sequence of fricative and stop is not allowed in Lasi, therefore word like /stæmp/ is adjusted with the technique of edge epenthesis (Aliani, 2022). The same is the case with Khowar where edged epenthesis is preferred to break consonant clusters. The complex vowel /aʊ/which is prohibited in the phonotactics of Khowar is adjusted through simple vowel /ɔ/.

The ranking of constraint can be represented as:

*[σ CC >> *VV >> CONTIGUITY, >>IDENT-IO, >>*ɪ, >> *C]σ

- Violation of DEP-IO and IDENT-IO by Optimal Candidate:

Ø → [ɪ],

/ aʊ / → [ɔ]

Input: s k aʊ t

↑ ↓

Output: ɪ s. k ɔ t

(9) Bulb

Tableau 34: Ø →[ɑ], / b / → [p]

[bʌlb]	*CC]σ	*[σ V	*OL	*OBS VOI	DEP-IO	IDENT-IO
a. bɑl.ɑp		*!			*	*
b. bʌlb	*!		*!	*!		
c. bɑ.lɑp					*	**

English can allow up to four consonant clusters, whereas Khowar does not allow for any consonant clusters. Like many Pakistani languages, clusters of consonants are not permitted in Khowar. In Lasi, there is a restriction against having voiced plosives in the

coda position. They consistently change into voiceless plosives instead (Aliani, 2022). The phonotactic rules of Khowar follow the same pattern as it will be elucidated after the analysis of given data.

The monosyllabic word /bʌlb/ is given as the input. The candidates are generated and pasted in the OT tableau given above. The analysis begins with the first candidate. The candidate ‘a’ is violating the markedness constraint *[σ V because its second syllable lacks an initial onset consonant. Additionally, the lower-ranked faithful constraints IDENT-IO and DEP-IO are transgressed, as the unrounded vowel /ɑ/ is inserted between the two consonants at the final syllable. The /b/ is substituted with /p/. Therefore, ‘a’ is rejected as an optimal candidate. Candidate ‘b’ is non-epenthetic and is violating the highly ranked markedness constraint *CC]σ as there is a cluster of consonants voiced bilabial /b/ and voiced lateral /l/ at the coda position. The constraint *OL that does not allow the occurrence of liquid and obstruent at syllable coda position is likewise violated by candidate ‘b’. It additionally violates the *OBS VOI constraint that demands obstruent in the coda to be voiceless. The bilabial /b/ is voiced and placed at the end. Therefore, it is the most disharmonic candidate.

The candidate 'c' emerges as the optimal choice. In each syllable, the nucleus (vowel) functions as the core. The introduction of the open unrounded vowel 'ɑ' through epenthesis successfully disrupts the consonant clusters at the coda position, effectively complying with both the *CC]σ and *OL constraints. The *OBS VOI constraint is satisfied because the coda ends with voiceless obstruent /p/. While managing to adhere to all the prominently ranked markedness constraints, candidate 'c' does, however, contravene the faithfulness constraints IDENT-IO and DEP-IO. The low-ranked constraint IDENT-(Voice) demands an input segment and its output correspondent must be identical (no change). It is violated by all the candidates except the faithful candidate ‘b’. In all other candidates the voiced plosive /b/ of the last syllable is substituted with the voiceless plosive /p/. Thus, to satisfy *OBS VOI, the IDENT-Voice is violated.

The loanword/bʌlb/ is adapted in Lasi somehow in a different manner. The voiced stop /b/ is replaced with the fricative /f/, followed by the insertion of the /e/ vowel to break the consonant cluster. Consequently, /bʌlb/ transforms into /bʌlef/ (Aliani, 2022). Both Khowar and Lasi share a similarity in not allowing consonant clusters and often opting for voiceless codas.

The ranking of constraint is represented as:

*CC]σ >> *[σ V >>*OL >> *OBS VOI. PARSE-C >> DEP-IO

- Violation of DEP-IO and IDENT-IO by Optimal Candidate: Ø →[ʌ], /b/ → [p]

Input: b ʌ l b

↓ ↑ ↓

Output: b ɑ. l ɑ p

4.9 Substitution and Deletion

The two different repair strategies are involved in the adjustment of English loanwords in Khowar. As analyzed above substitution is the commonly used repair strategy in Khowar for adjustment of any loanword, while deletion is the least ranked repair strategy. Deletion of consonants is usually preferred over deletion of vowels. It stands in opposition to substitution and epenthesis where vowels are preferred to be substituted or epenthesized. Below is the data where the two different processes are in action for the adjustment of English loanwords.

Table 11

Deletion and Substitution of Sound Segments while Adjustment

S.no	IPA Transcription	Khowar	Distance Value	Gloss	Phonemic Variation
1	kɑːrd	kɑːt	2	Card	/r/ → Ø, / d / → [t]
2	bɔːrd	bɔːt	2	Board	/r/ → Ø, / d / → [t]
3	kɒntækt	kɑn.tek	2	Contact	/t / → Ø, / ɒ / → [ɑ], / æ / → [e]
4	læntərn	lɑtèn	3	Lantern	/n/→ Ø, /r/→Ø,/æ/→[ɑ],/ə /→ [è]
5	æk.si.dənt	ek.sɪ.dæ̃n	3	Accident	/ t / → [Ø], / æ / → [e], / ə / → [æ̃]

(1) Card

Tableau 35*:* /r/ → Ø, / d / → [t]

[kɑːrd]	*COMPLEX cc	*[σ V	*OBS VOI	MAX-IO	IDENT-Voice	*C]σ

☞a./ kɑ:t/				*	*	*
b. /kɑ:rt/	*!				*	*
c. / kɑ:d /			*!	*		*

The input comprises the monosyllabic term [kɑ:rd]. The markedness constraint *OBS VOI stipulates that when a syllable concludes with an obstruent, that obstruent should be voiceless. In phonetics and phonology, a voiced obstruent is a sound made with vibrating vocal cords that is characterized by a partial or total closure of the oral cavity, which restricts airflow. Obstruents are a group of consonants that are made by constriction of the vocal tract; they may be further divided into voiced and voiceless consonants depending on whether or not the vocal cords vibrate when they are generated. Voiced obstruents include the sounds /b/, /d/, and /g /. These are made by the vocal cords vibrating.

The faithfulness constraint IDENT-IO (Voice) demands that the feature [voice] of a segment must be conserved in its corresponding output. In the data above, these restrictions are in conflict. A voiced obstruent is frequently avoided in Khowar, especially in the coda position of syllables, therefore, *OBS VOI is a higher-ranked constraint. But not all obstruent in Khowar is voiced specifically at the onset position.

In the above data candidate ‘a’ is the victor because it does not violate the higher-ranked markedness constraints *COMPLEX cc (*CC]σ), *OBS VOI, and ONSET (*[σ V). It ends with a voiceless obstruent /t/ thus satisfying *OBS VOI. The /r/ sound is removed to avoid a complex cluster in the final position, hence satisfying *COMPLEXcc. Also, it begins with an onset satisfying another markedness constraint ONSET. Though it violates the lower ranked faithfulness constraint IDENT-IO, as the /d/ segment has been substituted by /t/ and the MAX-IO constraint as the sound segment /r/ is deleted, still it cannot be excluded for being an optimal candidate.

Candidate 'b' breaches the *COMPLEXcc or *CC]σ constraint due to the consonant cluster present in the final syllable, leading to its rejection. The final candidate, ‘c’ runs afoul of the *OBS VOI constraint as it ends with a voiced obstruent /d/ in the coda position. Furthermore, both candidates transgress the lower-ranked *C]σ constraint. Hence it is concluded that candidate ‘a’ is the ideal or optimal candidate. Following the

transitivity of ranking given by Kager, (1999) that says “if C1>> C2 and C2 >> C3 then C1 >> C3” (p. 21), the markedness constraint *COMPLEX cc is ranked higher than all other constraints. Although Arabic does have the /t/ and /d/ consonants in its inventory, however, this specific loanword is adjusted with final devoicing in Qassimi Arabic. English word card /kɑːrd/ is adapted as [kart]. Two phonotactic rules of Khowar are acting on the loanword for its adjustment. Firstly, the phonotactic rules prohibit consonant clusters at the word's ending. Secondly, monosyllabic words frequently conclude with a voiceless coda in Khowar. Therefore, two processes are used to adjust the loanword.

It is represented as *COMPLEX cc >> *[σ V >> *OBS VOI >> MAX-IO, IDENT-Voice >> *C]σ.

- Violation of MAX-IO and IDENT-IO by Optimal Candidate:

/r/ → Ø,

/ d / → [t]

Input: k ɑ: r d

↓ ↓

Output: k ɑ: t

(2) Board

Tableau 36*:* /r/ → Ø, / d / → [t]

[bɔːrd/]	*CC]σ	*OBS VOI	MAX-IO	IDENT-IO (Voice)
☞a. bɔt /			*	*
b. / bɔːrd /	*!	*!		
c./ bɔd/		*!		

The lexical item given is the monosyllabic word [bɔːrd]. The analysis begins with the constraint *CC]σ, which is violated by the faithful candidate ‘b’. There is a sequence of consonants at the coda position that causes rejection of the candidate. Both candidate 'b' and candidate 'c' incur a critical violation of *OBS VOI constraint, given that their syllables conclude with a voiced obstruent /d/. The *OBS VOI constraint asserts that coda obstruents should be voiceless. Thus, the conclusive optimal candidate is 'a,' as it successfully meets all the highly ranked markedness constraints. Its syllable takes the

nucleus in the form of a vowel. The syllable begins with a vowel and ends with a voiceless obstruent /t/. The feature (voice) has been neutralized in a specific context (syllable coda). These satisfactions of higher ranked constraints by candidate 'a' are at the cost of violation of the lower ranked constraint. For example, MAX-IO is violated as the sound segment /r/ is deleted just to avoid a complex coda. Then IDENT-Voice is violated as the voiced obstruent is replaced by voiceless obstruent to satisfy *OBS VOI. However, these violations cannot hinder candidate 'a' to become the optimal candidate. Moreover, the processes used to adjust the loanword are substitution and deletion.

It should be noted that the fact that Khowar chose markedness constraint and ranked it above faithfulness constraint regarding voice in coda obstruent does not mean that it selects the same ranking regarding voice in other contexts, nor that it chooses this ordering in consideration of other elements in the syllable coda. In Khowar voice is contrastive in obstruent at onset position e.g., /kar/(ear) [k] is voiceless obstruent when we add a voiced obstruent [d] in onset position, it changes the whole meaning /dar/ (wood). Also, it should be noted that, unlike epenthesis, the process of substitution does not increase syllable weight. The above word is monosyllabic CVC in English, and it remains monosyllabic even after it is adjusted in Khowar. The ranking of constraint is represented as:

*CC]σ>> *OBS VOI >> MAX-IO >> IDENT-IO (Voice)

- Violation of MAX-IO and IDENT-IO by Optimal Candidate:

/r/ → Ø,

/ d / → [t]

Input: b ɔː r d

↓ ↓

Output: b ɔː t

(3) Contact

Tableau 37: /t / → Ø, / ɒ / → [ɑ], / æ / → [e]

[kɒn.tækt]	*CC]σ	*OBS Voice	IDENT-Back	MAX-C	*C]σ
a. kɒn.tækt	*!				*
☞**b. kɑn.tek**			*	*	*

c. kɒn.tæg		*!		*	*

The lexical item that is given as input is the English loanword [kɒntækt]. By analyzing the candidates, the optimal candidate will be selected. So, let us begin the analysis. The first constraint is *CC]σ, which claims that if there is a coda it should not be complex. This constraint is satisfied by all candidates except candidate ‘a’. The syllables of each candidate are closed, and they take only a single consonant as a coda except candidate ‘a’. It has a cluster of two consonants, and both are the voiceless plosives /k/ and /t/. This cluster of consonants at the coda position of a syllable clearly violates the higher ranked *CC]σ constraint. Therefore, candidate ‘a’ cannot be chosen as an optimal one.

The next constraint is *OBS Voice which requires obstruent at the coda to be voiceless. It is satisfied by all candidates except candidate ‘c’, where the second syllable ends with voiced velar plosive /g/. It encounters a serious breach of the *OBS Voice constraint. Thus, candidates ‘a’, and ‘c’ are rejected because of violation of the higher ranked constraints.

We are now left with ‘b’ that satisfies all the constraints. Let us now check how all constraints are satisfied by ‘b’. First of all, both its syllables have vowels as the main component satisfying NUC/V. Secondly, its codas are simple, thus *CC]σ constraint is satisfied. Finally, the obstruent in the second syllable is voiceless satisfying the *OBS Voice constraint.

However, even the optimal candidate shows violations of the lower-ranked constraints, but these violations are minimal. The faithfulness constraint IDENT-IO-Back states that the output must have the same back vowel as the input. But during adjustment, the back vowel /ɒ/ in the first syllable is replaced by the open unrounded vowel /ɑ/. The front open vowel /æ/ is substituted with the mid front vowel /e/. The MAX-C constraint that demands no deletion of a consonant sound segment is also violated by the optimal candidate as the voiceless plosive /t/ is deleted to avoid a complex coda. Thus, these two constraints are violated by the optimal candidate. The *C]σ constraint is violated by all candidates as the syllables in each candidate are closed having a coda. Thus, it is concluded that candidate ‘a’ is the most faithful while candidate ‘b’ is the optimal candidate. Khowar does not have the /ɒ/ vowel and bans the consonant cluster at either position. Therefore, the techniques of adjustment used are substitution and deletion.

Adomako (2008) studied the process of vowel epenthesis and consonant deletion during English loanwords adjustment in Akan (a language spoken in Ghana. The study concludes that the most frequently used approach to adjust English loanwords is vowel epenthesis. However, deletion is also used to adjust some English loanwords in Akan, but it is not a very common strategy. Likewise Khowar, deletion in Akan is limited to consonants only and it usually happens in the word's final position. If a loanword has a final cluster of velar + fricative or stop the former is deleted, and the vowel is elongated. Thus, the same loanword, /kɒn.tækt/ is adjusted in Akan as /kɔnta:tɪ/. However, an analysis reveals that the word /kɒn.tækt/ undergoes a distinctive adjustment in Khowar. In this instance, the vowel preceding the cluster is not prolonged; instead, it is replaced, and the latter segment of the consonant cluster, such as the stop /t/, is omitted.

The ranking of constraints is as follows:

*CC]σ >> *OBS Voice >> MAX-C >> IDENT-Back >>*C]σ

- Violation of MAX-IO and IDENT-IO by Optimal Candidate:

/t / → Ø,

/ ɒ / → [ʌ]

Input: k ɒ n. t æ k t

↓ ↓ ↓

Output: k ɑ n. t e k

(4) Lantern

Tableau 38: /n/, /r/ → Ø, / æ / → [ɑ], / ə / → [è]

[læn.tərn]	*CC]σ	ONSET	*ə	IDENT-IO-Front	IDENT-IO-Central	MAX-C	*C]σ
a. lɑt. ən		*!	*!				**
☞b lɑ.tèn				*	*	**	*
c. læn.tərn	*!		*!				**

The lexical item given as an input is [læntərn]. The candidates are given in the column in the OT tableau. The constraints are given in the row. The analysis of these candidates against the constraints will eventually select the optimal candidate. The first

constraint *CC]σ is violated by the last candidate, as the second syllable takes a consonant cluster of voiced retroflex /r/ and the voiced nasal /n/ in the coda position. This violates the *CC]σ constraint. The second constraint is ONSET which is violated by candidate 'a' as the second syllable begins with a vowel. The next constraint is *ə. It is violated by candidate 'a' and candidate 'c' where the second syllable in each takes the central /ə/ between consonants. The 'schwa' sound is prevalent in English and is replaced in Japanese as well as in Turkish by a native vowel (Kay, 1995; Beel & Felder, 2013). The only candidate that satisfies all these constraints is candidate 'b'. Thus, it is picked as the optimum candidate.

The optimal candidate shows infringement of the other lower-ranked constraints. The IDENT-IO-Front is violated as the short, lower, front vowel /æ/ in the input first syllable is replaced by the unrounded open vowel /ɑ/. Then the IDENT-IO-Central constraint is again violated by the optimal candidate because the central vowel /ə/ in the second syllable of the input is replaced with the vowel /è/. The constraint MAX-C has been violated by the optimal candidate as the voiced retroflex /r/ is deleted to avoid cluster at the coda position as well the nasal /n/ in the first syllable. Then the least constraint *C]σ is violated by all candidates as all have syllables that are closed and end with a coda except the first syllable of candidate 'b', which is open. Remember that these are very minimal violations and cannot affect the optimality of a candidate. Thus, it is concluded that candidate 'c' is the most faithful candidate, while Candidate 'b' is the winner or optimal candidate. It should also be noted that the processes involved in the adaptation of the English loanword are double substitution as well as deletion.

The constraints can be ranked as follows:

NUC/V, *CC]σ >> *ə >> IDENT-IO-Front, IDENT-IO-Central, MAX-C >> *C]σ

- Violation of MAX-IO and IDENT-IO by Optimal Candidate:

/n/→ Ø, /r/ → Ø,

/ æ / → [ɑ], / ə / → [è]

Input: l æ n.t ə r n
↓ ↓ ↓ ↓

Output: l ɑ. t è n

(5) Accident

Tableau 39: / t / → [Ø], / æ / → [e], / ə / → [ã̆]

[æksidənt]	*Complex cc	*NC0	*VORALN	Max-IO	IDENT-IO (Voice)
☞a./ ek.sɪ.dã̆n/				*	*
b./æk.si.dənt/	*	*!	*		
c. / æks.dã̆nt /	*	*!		*	*

A new markedness constraint has been added here which is *NC0 (No nasal plus voiceless obstruent sequences). The phonotactic rules of Khowar do not allow the nasal to follow a voiceless obstruent. In the above data candidate 'a' is the optimal one because it does not violate any of the higher-ranked constraints. To satisfy the *NC$_0$ constraint the voiceless alveolar plosive /t/ sound in the input has been deleted in the output form (candidate a). In simple words, it can be said that voiceless obstruent in input /t/ has been deleted to avoid *NC0 as well as *Complexcc constraints. It violates the MAX-IO constraint to satisfy the above-mentioned constraints. As far as voice is concerned candidate 'a' violates faithfulness constraint IDENT-IO (voice) just to satisfy markedness constraint *VORALN (vowels must not be oral before nasal segment). Thus, in Khowar when vowel occurs before any nasal segment, they become nasalized and there is little chance of nasal and voiceless obstruents happening together.

Candidate 'b' violates all three markedness constraints and fatally violates the highest ranked new constraint *NC0 and *COMPLEXcc. Therefore, it is rejected as an optimal candidate. Candidate 'c' also violates highly ranked markedness constraints and cannot be an optimal candidate. It can be represented as:

*Complex cc, *NC0, *VORALN >>Max-IO, IDENT-IO (Voice)

- Violation of MAX-IO, and IDENT-IO by Optimal Candidate:

/ t / → [Ø]

/ æ / → [e], / ə / → [ã̆],

Input: æ k. s ɪ. d ə n t

↓ ↓ ↓

Output: e k. s ɪ. d æ̃ n

Table 12

Multiple Processes in the Adjustment of English Loanwords

S.no	IPA Transcription	Khowar Transcription	Changes	Gloss	Phonemic Variation
1	prəʊgræm	pʊrgɑ:m	4	Program	/əʊ/→[Ø],/r/→[Ø],Ø →[ʊ],/æ/→ [ɑ:]
2	tʊənəmənt	tər.nɑ.mæ̃n	5	Tournament	/t/→[Ø],[Ø]→r,/ʊə/→[ɔ],/ə/→[ɑ],/ə/→ [æ̃]

(1) Program

Table 40*:* / əʊ / → [Ø], / r / →[Ø], Ø →[ʊ], / æ / → [ɑ:]

[prəʊgræm]	NUC/V	*[σ CC	*VV	Max-IO	IDENT-IO (Open)	DEP-V	*[æ]	*C]σ
a./ pʊr.gɑ:.m /	*!	*!		**	*			*
☞b./ pʊr.gɑ:m /				**	*	*		*
c. /prəʊ.græm /		*!*!	*!				*	*

The lexical item [prəʊgræm], which is disyllabic is given as an input. The best possible candidates are displayed in the column of the tableau. The constraints are ready and the analysis of candidates against the given constraints will help declare an optimal candidate. It is time to analyze the candidates and the constraints.

The NUC/V that is the highest ranked constraint is violated by the very first candidate as its last syllable contains a syllabic nasal consonant /m/ trying to build a syllable without taking a vowel. It is a clear breach of NUC/V constraint and thus candidate ‘a’ is rejected. All the other candidates satisfy it. The next constraint is *[σ CC which is violated by candidate ‘a’ but candidate ‘c’ violates it twice. The first as well as second syllable of candidate ‘c’ begins with a complex onset. There is a cluster of voiceless plosive /p/ and voiced approximant /r/ in the first syllable’s onset and the sequence of voiced velar /g/ and voiced approximant /r/ in the second. Candidate ‘c’

cannot be declared as an optimal one either. The next constraint is *VV which disfavours the sequence of vowels in a syllable. In Khowar syllables do not often take a sequence of vowels (diphthongs). Thus, it is violated by the already rejected faithful candidate ‘c’. The first syllable of candidate ‘c’ takes the sequence of vowels. This *VV is obeyed by candidate ‘b’ and ‘a’. Hence, we have our winner candidate that is ‘b’. It satisfies all the higher-ranked constraints. Its syllables contain vowels as their head, the syllables take simple onset and there is no sequence of vowels in between these syllables.

Moreover, the lower-ranked constraints are violated by all the candidates either once or twice. Let us now take the optimal candidate first. To satisfy the higher-ranked constraint candidate ‘b’ (optimal) has violated the lower-ranked constraints. To avoid the complex onset the back, close (high) vowel /ʊ/ is inserted in between the consonants on the onset in the first syllable, and the voiced approximant /r/ is deleted in the second syllable just to satisfy *[σCC. Then to avoid the occurrence of vowel sequence and to satisfy *VV the vowel sequence (diphthong) /əʊ/ is deleted. The front open vowel /æ/ in the second syllable is replaced with the longer vowel /ɑː/ violating the IDENT-IO constraint. This is how even the optimal candidate violates constraints. The *[æ] is violated by the faithful candidate but is satisfied by the optimal candidate. As we have analyzed the adjusted words in Khowar previously. They take /æ/ in closed syllables. Therefore, it is a lower-ranked constraint, and its violation does not affect the optimality of a candidate. The last and the least ranked constraint *C]σ is violated by all since each syllable of the candidates has taken consonant at the coda position. It should be noted that the number of violations of the constraints is similar between the faithful ‘c’ and the optimal ‘b’, yet ‘b’ is selected as the optimal one. The reason is that candidate ‘c’ poses a violation of top-ranked constraints while candidate ‘b’ does not. Based on the analysis it is concluded that candidate ‘b’ is optimal while ‘c’ is the most faithful candidate. The repairing strategies involved in the adjustment of the English loanword include double deletion, substitution, and epenthesis.

When the diphthong /əʊ/ and the short vowel /æ/ appear in an English loanword, Pashto adjusts it with the substitution of short mid-back rounded vowel /ə/ substitutes the English diphthong /əʊ/, and the low back rounded /ɑ/ replaces the English short vowel /æ/, such as in the case of the loanword program /prəʊgræm/ (Iqbal & Ullah, 2023). In the process of integrating this loanword into Khowar, certain characteristics have been

replaced. Moreover, consonant clusters positioned at the onset and coda have been disrupted by the insertion of vowels.

The ranking of the constraints is as follows:

NUC/V. *[σ CC >> *VV >> Max-IO, IDENT-IO (Open), DEP-V >> *[æ], *C]σ

- Violation of MAX-IO, DEP-IO, and IDENT-IO by Optimal Candidate:

/ əʊ / → [Ø], / r / →[Ø]

Ø →[ʊ]

/ æ / → [ɑ:],

Input: p r əʊ. g r æ m

↑ ↓ ↓↓

Output: p ʊ r. g ɑ: m

4.10 Findings and Discussion

This section presents the findings of the study that were gained after analyzing the data. The second part of this section consists of detailed discussions of these findings.

While reporting the findings the focus is kept on the phonological adaptation of English loanwords in Khowar. It is worth mentioning that the findings presented in this section are based on the actual data gathered by the researcher. The collected data were analyzed using the guidelines of Optimality Theory (OT). To enhance clarity, conciseness, and convenience, the study findings are outlined in bullet points below:

1. In an attempt to explore the adaptation of English Loanwords in Khowar, it became essential to determine if Khowar speakers use English loanwords in their daily conversation. Therefore, the researcher employed participant observation as a method to gather data for this investigation. This method also aided in understanding how Khowar speakers articulate English words. The researcher picked three distinct semantic domains that were anticipated to provide sufficient data for analysis. These domains included an educational institution, an electronic shop, and a bus terminal. Each domain yielded a distinct quantity of loanwords. Accordingly, among the total loanwords collected, 34 originated from the domain of education, 26 from the electronics shop, and 22 from the bus terminal. The results indicate that the English loanwords were used in all the selected domains. The researcher selected participants from these domains and started collecting data

using an audio recorder and observation sheet. The findings reveal both literate and semi-literate, as well as illiterate Khowar speakers, frequently incorporate English loanwords into their everyday conversations. The first objective of this research study was to determine whether Khowar has borrowed any word from English. Thus, the findings show that Khowar has extensively borrowed English loanwords.

2. The second objective was related to the processes involved in the adaptation of English loanwords. As such, this study sought to find out the adaptation processes or repair strategies. It also endeavored to show the structural changes in an adjusted loanword. Three major repair strategies were found for the adjustment of English loanwords into Khowar. These were substitution, deletion, and epenthesis. Among these techniques, substitution was the dominant one that was applied to 44% of the collected loanwords. The process of epenthesis was applied to 12% of the collected loanwords and the lowest among all is the technique of deletion which was applied to only 2% of the total loanwords. Two different processes acted at the same time to adjust the illicit structure of the loanwords. For example, substitution and epenthesis in a combination adjusted 18% of the loanwords. Deletion of a sound segment was rarely found, however, deletion in combination with substitution acted on 15% of the illicit loanwords. Finally, all three techniques at the same time operated on 9% of the collected loanwords.

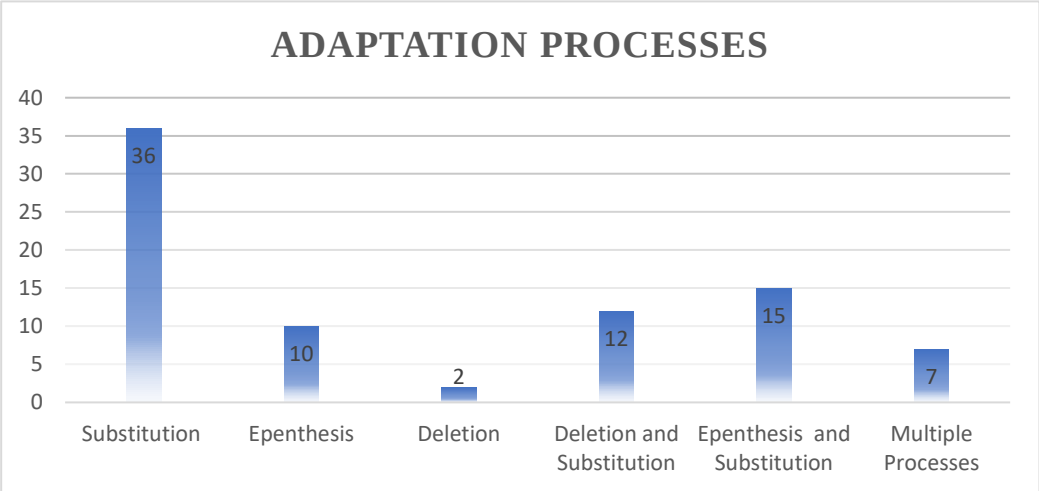

Figure 7: Adaptation Strategies Used to Adjust English Loanwords.

3. The third and final objective of this research was to identify the phonotactic constraints of Khowar, the findings of the study show that Khowar commonly favors concluding the coda with a voiceless obstruent. The voiced obstruent at the

coda position of the English loanword was adjusted using the technique of substitution. For example, the voiced velar obstruent /g/ of the loanwords [mʌg] and [bæg] was adjusted through the substitution of the sound segment with voiceless velar /k/. Similarly, the voiced stop /d/ at the end of loanwords like [bɔːrd], [kɑːrd], and [rekɔːd] was substituted with voiceless stop /t/. The technique of substitution was used to devoice sound segments. In the same way substitution of vowels was also dominant in the adjustment of diphthongs. Khowar does not have any complex vowels. Therefore, the diphthongs in English loanwords were substituted with a single vowel. As in the case of [kəʊt], [rəʊd], and [məʊtər] the complex vowels were simplified with a single vowel /ɔ/. Thus, the findings show that Khowar prefers the syllables to end with a voiceless coda. Also, the phonotactic restrictions of Khowar do not allow it to use complex vowels within its syllables. Hence, the English phonemes that were foreign to Khowar were substituted by their closest Khowar equivalents. The substitution of phonemes included both vowel and consonant substitution.

4. As far as epenthesis is concerned the findings reveal that it did not involve consonant insertion rather the insertion of a vowel segment was influential. The main aim of epenthesis in the case of Khowar was to break the consonant clusters at different syllable positions of the loanword. For example, in the adjustment of loanwords [skuːl] [stuːl] and [stɔːr], the short vowel /ɪ/ was inserted at the start of the syllable because it was analyzed that the loanwords that begin with s+obstruent were adjusted by insertion of the short vowel /ɪ/ at the beginning of the word's syllable just before the onset consonant. However, in loanwords like [glɑːs], [klɑːs], [slɪpər], and [fɪlm], etc., the short vowel was inserted in between consonants at the onset position as well as coda position to break the consonant clusters. It is found that when there is a sequence of stop/fricative + liquid in the loanword, it is adjusted in Khowar by inserting a short vowel /ɪ/ in between the consonant cluster. For example, /klɑːs/, / klɪnɪk/ /klɪp/, / sleɪt/, and /slɪpər/ were adjusted using the short vowel in between the consonant clusters at the onset position. The insertion of sound segments also caused the loanwords to increase their weight. The above-mentioned loanwords are mostly monosyllabic however after their adjustment they became disyllabic and the disyllabic became trisyllabic. This is how a single loanword altered its structure to be adapted. The results suggest that Khowar phonotactics prohibit the occurrence of consonant clusters in

any position. Consequently, English loanwords containing such clusters were modified through the use of epenthesis.

5. The least used repairing technique was deletion. There were only two instances where deletion alone was used to adjust loanwords. In the loanwords [sɪˈment] and [grɑːs] deletion of a sound segment happened in both the onset and coda positions. The deletion was purely to avoid the cluster of consonants. The findings show that in Khowar nasal does not usually follow any voiceless obstruent therefore loanwords like [sɪˈment] or [æksidənt] were adjusted by deletion of the nasal sound itself or the voiceless obstruent. Thus, it is found that in Khowar loanword adaptation, the deletion of sound segments is not as frequently utilized as other strategies such as epenthesis and substitution, and the deletion of consonants is usually preferred over the deletion of vowels
6. The use of Optimality Theory was instrumental in the generation of the findings. The constraints in OT were the main source of selecting the optimal candidates. Those candidates were selected optimal that satisfied the higher ranked constraints of OT. As discussed above Khowar does not allow complex clusters at either position. Therefore, the English loanwords having consonant clusters were adjusted using the highly dominant *[σ CC and *CC]σ constraints. Similarly, Khowar's phonotactics do not allow a sequence of vowels or diphthongs therefore they were adjusted through the process of substitution. The diphthongs were substituted with a single vowel or monophthongs. The constraint used to adjust loanwords with the sequence of vowels was the *VV constraint, which disallowed syllables having a VV sequence of vowels. The findings further reveal that Khowar like other languages takes vowel as the head of the syllable. In Khowar, a vowel is only allowed to be the obligatory sound within a syllable. Thus, it does not have any syllabic consonant therefore the universal constraint (NUC/V) was ranked the highest of all. Likewise, the findings indicate that Khowar frequently allows syllables to take voiceless obstruent at the coda position. Those English loanwords that had voiced obstruent at coda were adjusted through substitution. The substitution of a sound segment potentially helped in the devoicing of sound segments. The constraints that played a role in devoicing the voiced obstruent were *OBS VOI and *VoicedCoda. For example, in the loanword [rekɔːd] and [ləʊd] the final /d/ was devoiced with the substitution of /d/ with voiceless stop /t/. Similarly, Khowar does not have the mid-central vowel or schwa /ə/ in its

phonemic inventory, therefore, the loanwords that had schwa in them were substituted with the related vowel available in Khowar. The constraint used to avoid the occurrence of schwa /ə/ was the *ə constraint. Khowar includes oral vowels, but the findings show that any vowel preceded or followed by a nasal consonant became nasalized. The constraint *VORALN, which claims "vowel must not be oral before a nasal consonant" was crucial in determining the optimal candidate. It is found that nasal in Khowar does not follow a voiceless obstruent therefore, the English loanwords that had nasal followed by obstruent were adjusted through the constraint *NC0, (No nasal plus voiceless obstruent sequences). Similarly, the findings show that syllables in Khowar often begin with an onset, especially the monosyllabic words often take the onset consonant. Therefore, the constraint ONSET (*[σ V) was ranked higher. It is also observed that the phonotactic restrictions of Khowar allow it to use both open and closed syllables, but closed syllables are often preferred. It is worth noticing that although Khowar does not always require a coda it does not ban it. In Khowar, syllables frequently exhibit a coda at the final position. That is, if a coda is present in the source word, it is preserved, and no phonological processes are involved to eliminate a coda. Similarly, if it is an open syllable, it remains the same. Thus, the constraint that demands syllables to always remain open (*C] σ) was ranked lowest. Along with this the faithfulness constraints, including MAX-IO, IDENT-IO, and DEP-IO, were ranked lower than the markedness constraints. This ranking was because, during the adjustment process, changes in the structure of loanwords occurred that were not permitted by these faithfulness constraints. Therefore, the findings suggest that Optimality Theory is most effectively employed when examining the phonological adaptation of loanwords across various languages.

7. The study investigated the adaptation of English loanwords in Khowar at the phonological level while considering the handling of English syllables in loanword adaptation. The phonotactic analysis of English loanwords in Khowar entailed manipulating English loanwords' syllable structures to make them compatible with Khowar syllable structures. English loanwords contained clusters of consonants at syllable onset and coda positions. Some of them also had onset-less syllables. They were re-syllabified, for example, the onset-less second syllable of the loanword [kɒl.ɪdʒ] was adjusted through the re-syllabification process as [kɑ.lɪdʒ].

8. The findings show that Khowar does not have the /ʌ/ sound thus it is replaced with the nearest possible sound /ɑ/. In the loanwords /mʌg/, /bʌlb/ / rʌb.ər/, the central mid vowel /ʌ/ was substituted with the central low vowel /ɑ/. Similarly, Khowar does not have the back vowel /ɒ/ sound, thus the loanwords having /ɒ/were replaced by either /ɑ/ or /ɔ/. For example, the words /bɒks/ and/kɒlɪdʒ/ were adjusted with the substitution of /ɒ/ with /ɑ/. In the context of Khowar, the utilization of the central vowel /ə/ is infrequent, whereas it is prominent in English. Rarely any word may take /ə/ but this study found that the use of /ə/ is trivial in Khowar. The /ə/ was substituted with /ʊ/, /ɑ/, or /e/. In the loanword / pəˈliːs/ and /səˈluːt/ /ə/ was substituted with /ʊ/. In the word / dɒk.tər/, the /ɒ/ and /ə/ were both substituted with /ɑ/. The loanwords having diphthongs were adjusted using a simple vowel. For example / əʊ/ in the loanword /rəʊd/, /kəʊt/, and /fəʊ.təʊ/ were adjusted using the short vowel /ɔ/ and /ʊ/. Additionally, the /eɪ/ diphthong was substituted with a singleton vowel /e/ in loanwords like /sleɪt/, and /pleɪt/. Similarly, /aɪ/ in the loanword /taɪm/ was adjusted with /e/. It is found that in Khowar, both long and short vowels are employed to replace diphthongs from English loanwords during adjustment.
9. The findings show that in Khowar, the substitution of phonemes includes both vowel and consonant substitution. However, epenthesis is only limited to consonant insertion while deletion is limited to consonant deletion. The sole purpose of epenthesis and deletion was to avoid complex consonant clusters. Epenthesis was utilized to break the consonant cluster at both the onset and coda positions, while deletion was applied specifically to break the consonant cluster solely at the coda position.
10. Finally, the results show that during the adjustment of a single loanword, two or more processes can be involved. It can be observed that one process is used twice like double substitution or double epenthesis, single epenthesis double substitution, etc as in the case of the word bottle where there is insertion of a single vowel sound, but substitution happens twice.

4.11 Discussion

The previous section focused primarily on presenting the findings obtained from a thorough analysis of data collected through participant observation from three distinct domains. This section primarily aims to discuss the aforementioned findings. Thus, the

primary objective of this section was to ascertain if Khowar has borrowed English loanwords, and if so, how these words have been adapted to align with the phonotactic rules of the language. Additionally, the discussion reports the processes employed in adjusting these borrowed words within the Khowar language.

The study set out to investigate the English loanwords that have entered Khowar language. In Pakistan, English holds a pervasive influence, dominating various facets of society such as popular entertainment, music, sports, etc. English has become a crucial gateway toward achieving success. In the linguistic landscape, English holds a prominent position, surpassing even the national language of Pakistan, Urdu, which ranks second in terms of popularity and usage. This widespread prevalence of English has significantly affected the status of regional languages. English has exerted a considerable influence on Pakistani languages, as is evidenced by the integration of numerous English loanwords through lexical borrowing. This study supports this widely accepted assumption. The findings of the study show the dominance of English over indigenous languages in Pakistan specifically Khowar. To examine the usage of English words in diverse contexts within Chitral the researcher focused on three specific domains: an educational institution, an electronic shop, and a bus terminal. Participants from these areas, representing various professions and literacy levels (literate, semi-literate, and illiterate), were selected to assess the utilization of English words. The data collected from these domains yielded substantial evidence, indicating widespread usage of English loanwords across all spheres of life and by individuals from diverse professional backgrounds. This implies that English loanwords are widespread and integrated into the everyday language of Khowar speakers.

The research also explored how loanwords are modified to comply with the phonotactic rules of Khowar and examined the processes engaged in adapting these loanwords. The results indicate that the structure found in English loanwords was not present in the Khowar language. Consequently, Khowar employed specific adaptation methods to modify the incompatible structure of these English loanwords. The findings reveal that Khowar utilized three distinct techniques that are substitution, epenthesis, and deletion to adjust these loanwords. Of these techniques, substitution emerged as the most frequently employed strategy. Concerning the phonotactic constraints of English and Khowar, it was observed that English permits CCV, CVVC, CVCC, and CVVC syllabic structures, whereas Khowar predominantly favors the CVC syllable pattern. In Khowar,

consonant clusters are absent, necessitating the implementation of either epenthesis or deletion processes to resolve such clusters. In the adaptation of foreign syllable structures, Khowar tends to favor the vowel epenthesis as a preferred method. Likewise, substitution was employed to alter the voiced final consonant since Khowar typically favors voiceless codas. The process of substitution was also applied to the illicit vowel sequence in the English loanwords. The findings reveal that Khowar prohibits the occurrence of complex vowels (diphthongs), therefore they were simplified by substituting the diphthongs with monophthongs. Lastly, the study indicates that certain English vowel sounds are absent in Khowar; hence, they were replaced with the nearest corresponding native sounds during the adjustment of English loanwords having these sounds.

The discussion concludes by highlighting the use of Optimality Theory (OT) as the theoretical framework. This study was limited to the tenets of Optimality Theory (OT). Optimality Theory consists of constraints that are in conflict with each other to choose the optimal candidate. Candidates with fewer violations of higher-ranked constraints are more likely to be considered optimal. In this study, the constraints of OT were crucial for selecting an optimal candidate. This study used the tableaus of OT. The input was given in form of English lexical items. The EVAL component of OT generated an unlimited set of candidates and the best possible candidates were pasted on the left side of the OT tableau. These candidates were engaged in a competition against the given set of constraints. The constraints were ranked according to the phonotactic rules of Khowar. For example, Khowar does not allow consonant clusters at either position so *ComplexCC was ranked higher. Similarly, the findings reveal that Khowar prefers syllables to begin with an onset thus the onsetless syllables were adjusted accordingly. Therefore, the ONSET/*[σ V was ranked higher. Hence, the markedness constraints like *VV, *VORALN, /*[σ V, etc., were ranked higher than the faithfulness constraints like IDENT-IO, DEP-IO, and MAX-IO, etc. Hence, Optimality Theory (OT) proved to be a pertinent theoretical framework for investigating the adaptation of English loanwords in Khowar. These English loanwords undergo phonological modifications to align with the phonotactic rules of the Khowar language. Optimality theory (OT) explained how the input, such as the English loanword, was mapped onto an output. It is concluded that OT can be used to explain the adaptation of loanwords in any language.

4.12 Chapter Summary

This chapter focused on the data presentation and the data analysis. It delved into the phonological processes responsible for the adaptation of English loanwords in Khowar. These processes included: epenthesis, substitution, and deletion. Additionally, it scrutinized the phonotactic restrictions inherent in the Khowar language. The data was thoroughly examined within the framework of Optimality Theory, elucidating the rationale behind selecting the most suitable candidate. Finally, the chapter focused on presenting the findings that emerged after the detailed analysis of the data and concluded by discussing the implications of these findings.

CHAPTER 5

5. CONCLUSION

This study was conducted with the aim of exploring whether Khowar has borrowed words from English and to understand how these words are integrated into the Khowar vocabulary. The study particularly emphasized the adaptation strategies involved in this process, employing Optimality theory as its theoretical framework. The phonotactic restrictions of Khowar were also investigated. Upon thorough data collection, analysis, and examination of findings, it is concluded that Khowar has significantly borrowed lexical items from English. These words have been adjusted into Khowar to the extent that it is rare to find a sentence in Khowar without the use of an English word. They have been adjusted based on Khowar's phonotactics, employing three adaptation techniques which include substitution, deletion, and epenthesis, to adjust the English loanwords. Furthermore, Optimality Theory played a crucial role in explaining why recipient languages tend to favor insertion, deletion, and feature change during loanword adaptation. This demonstrates that Optimality Theory outperforms other theories when it comes to accounting for the process of loanword adaptation.

5.1 Answers to the Questions

This research addresses the following research questions:

1. What are the loanwords that Khowar has taken from English?

Based on the findings of this research study, it is concluded that Khowar has extensively borrowed words from English. The researcher chose three distinct semantic domains to gather loanwords, and each domain yielded a substantial amount of data. The borrowing is prompted as Khowar lacks local lexical items for referring to specific entities such as activities and objects. To fill the lexical gap Khowar has borrowed words from English. Moreover, the English loanwords provided an additional lexical item for which there was already a native lexical item.

2. What phonological processes are involved in the adaptation of English loanwords in Khowar?

The findings of this study show that the restructuring of English loanwords in Khowar happens at phonological level. The study concludes that the adjustments of the English loanwords are not random, rather, the study identified three specific phonological processes involved in adapting these loanwords: substitution, vowel insertion (epenthesis), and deletion of sound segments. The primary phonological process among these was the substitution of sound segments, followed by epenthesis, with deletion being the least frequently employed strategy. The study concludes that some vowel sounds are not found in Khowar. These include the mid vowel /ʌ/, the back vowel /ɒ/, and the central vowel /ə/. Thus, these sounds are substituted with the nearest possible sounds like /ɑ/, /ɔ/, and /ʊ/. Substitution and epenthesis affected the consonants and vowels both, but deletion was restricted to consonants only.

3. How do the phonotactic constraints in Khowar influence the adaptation of English loanwords?

The structures of English loanwords that were illicit to Khowar's phonotactics were adjusted using the adaptation strategies. Khowar does not allow consonant clusters at onset and coda positions. For example, the /sk/, /sl/, /st/, or /kl/ sequences in the English loanwords like school, store, slipper, clinic, etc., were adjusted with the epenthesis of a sound segment. Because these structures are illicit and cannot be found in Khowar, therefore, they are adapted according to its phonotactics. English allows consonant clusters at both the onset and coda positions, but such sequences are not allowed in Khowar. The research findings suggest that vowel epenthesis plays a crucial role in breaking complex consonant clusters. The study concludes that the short vowel /ɪ/ is the most epenthesized vowel.

Similarly, the findings reveal that the phonotactic rules of Khowar do not allow the occurrence of complex vowels within its syllable. Therefore, the English loanwords that contained complex vowels (diphthongs) were adjusted through the process of substitution. For example, in loanwords such as /rəʊd/, /kəʊt/, and /fəʊ.təʊ/, the sound /əʊ/ was modified using the short vowels /ɔ/ and /ʊ/. Moreover, in words like /sleɪt/ and /pleɪt/, the diphthong /eɪ/ was replaced with a single vowel /e/. Similarly, the sound /aɪ/ in the word /taɪm/ was substituted with /e/. Thus, the study concludes that Khowar often

allows for a simple peak (CVC) specifically when the syllable is closed. Therefore, the English loanwords having complex vowels as peak such as diphthongs or triphthongs in a closed syllable are modified when integrated into Khowar.

In Khowar phonotactics, a nasal sound is not succeeded by any stop, leading to a pattern where either the nasal or the obstruent is omitted when both are present. For instance, the borrowed term /sɪ.ment/ is adapted as /sɪ.met/, involving the removal of the nasal sound. Similarly, in the loanword /kɒn.tækt/, the final consonant cluster at the end of the word is adjusted by omitting the voiceless stop /t/. Consequently, it is observed that deletion, akin to epenthesis, is employed to break down consonant clusters in the language. The alterations in English loanwords result in structural modifications. For example, a monosyllabic word transforms into a disyllabic one, and if it is already disyllabic, it further extends to a trisyllabic form. Hence, the study concludes that Khowar has certain phonotactic constraints that are applied to the loanwords during adjustment. Thus, phoneme substitution, vowel epenthesis, and segment deletion are the important processes in Khowar's adaptation of English loanwords, facilitating the adjustment of loanwords to align with Khowar's phonotactic rules.

5.2. Summary

The research findings address the research inquiries by highlighting the extensive borrowing of words from the English language into Khowar. These English loanwords possess structures that are not native to Khowar leading to the implementation of a particular adaptation method. Khowar utilizes methods such as substitution, epenthesis, and deletion to accommodate the English loanwords according to its phonotactics. Thus, this study confirms that phoneme substitution, vowel epenthesis, and segment deletion serve as fundamental processes in adapting English loanwords in Khowar. Consequently, modifications are made to these loanwords to better align them according to the phonotactics of Khowar. This study proves that the main cause of modification in the English loanword is because of the phonological differences between the two languages, English and Khowar.

5.3. Recommendations

This study is the first attempt to use optimality theory (OT) to analyze language interaction and adjustment of English loanwords in Khowar. The study has used English; however, English is not the only language with which Khowar came in contact. Some

other languages like Pashto, Farsi, and Urdu have deeply influenced Khowar as it has taken many words from these languages as well. It is recommended that another study should be conducted on the interaction of Khowar and one of the above-mentioned languages.

This research solely looked at nouns that were seen to be borrowed from the source language into Khowar. Nouns are chosen because they are the most commonly borrowed words across languages. It is recommended that another account of loanwords in other content word classes of Khowar (verbs, adjectives, and adverbs) be undertaken. Moreover, this research is related to only phonological changes in the structure of loanwords after adjustment, however, it could be extended to morphological and semantic changes in loanwords' structure.

Regarding Khowar syllable structure, a detailed study must be undertaken. There is no such research study that only focuses on the syllable structure of Khowar. While conducting this study the researcher went through different sources whether any detailed study was conducted on the syllable structure of Khowar but could not find any single one.

The researcher suggests further extensive investigation in this field, acknowledging the inability to address all associated issues and aspects. He has done his bit which certainly is not enough, and the author is aware of this shortcoming. Finally, It is recommended that the researchers who are interested in Khowar can use the findings of this research study.

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APPENDICES

A1: Total Loanwords Collected from Different Domains

Serial no	IPA Transcription	Khowar	Gloss
Education			
1	kɒlɪdʒ	kɑlɪdʒ	College
2	bæŋk	bãŋk	Bank
3	dɒktər	dɑk.ʈʰɑːr	Doctor
4	stjuːdnt	istʊdãn	student
5	bæg	bek	Bag
6	rekɔːd	rɪ.kɑːt	Record
7	hɒstəl	hɑstèl	Hostel
8	bɔː.dər	bɑ.der	Border
9	rʌbər	rɑbʊł	Rubber
10	vəʊt	vɔːt	Vote
11	kəʊt	kɔt	Coat
12	peɪ.pər	pe. pɑːr	Paper
13	geɪt	gèt	Gate
14	mɑːstər	meʃtèr	Master
15	pɒlɪʃ	pɑ.lɪʃ	Polish
16	feɪl	feːl	Fail
17	mænɪdʒə(r)	mɑndʒèr	Manager
18	skuːl	ɪs.kuːl	School
19	klɑːs	kɪlɑːs	Class/
20	klɪnɪk	kɪlɪnɪk	Clinic/
21	steɪ.plər	Is.tep.lèr	Stapler
22	slɪp	sɪ.lɪp	Slip
23	sleɪt	sɪlet	Slate/
24	slɪpə(r)	sɪlɪpèr	Slipper

25	bɒtl	bʊθa:l	Bottle/
26	gra:s	ga:s	Grass
27	bɔ:rd	bɔ:t	Board
28	pɪə.ri.əd	pe.ret	Period
29	ju:nɪˈvɜ:rsəti	ju:nɪʋestɪ	University
30	ga:rd	ga:t	Guard
31	ka:rd	ka:t	Card
32	læntə(r)n	la.tèn	Lantern
33	skaʊt	ɪs.kɒt	Scout
34	səˈlu:t	sʊlʊt	Salute
Electronic Shop			
1	pəʊ.stər	pɒs.tèr	Poster
2	fəʊtəʊ	fʊtʊ	Photo
3	ˈtel.ɪ.fəʊn	tɪ.lɪ.fu:n	Telephone
4	reɪ.di.əʊ	re.diʊ	Radio
5	taɪm	tæm	Time
6	stɔ:(r)	ɪs.tɔ:r	Store
7	stu:l	ɪs.tu:l	Stool
8	fɪlm	fɪli:m	Film
9	gla:s	gɪla:s	Glass
10	bʌtn	batæ̃n	Button
11	klɪp	kɪlɪp	Clip
12	plæstɪk	pala.stɪk	Plastic
13	əˈla:rm	ala.ram	Alarm
14	kɒntækt	kan.tek	Contact
15	laʊdˈspi:.kər	lɔs.pɪ.kèr	Loudspeaker
16	mʌg	mak	Mug
17	keɪk	kek	Cake
18	krɪkɪt	kɪrket	Cricket
19	prəʊgræm	pʊrga:m	Program
20	tʊənəmənt	tɔ(r)nʌmæ̃n	Tournament
21	rɪˈkru:t	ran.gúṭ	Recruit

22	həʊˈtel	hɔ. t è l	Hotel
23	bʌŋgələʊ	bɑŋ.gɑ.lɑ	Bungalow
24	bəʊ.lər	bɑ.lèr	Bowler
25	pleɪt	pɪlet	Plate
26	sɪˈment	sɪˈmet	Cement
Bus Terminal			
1	məʊ.tər	mɔ.tèr	Motor
2	ləʊd	lɔːt	Load
3	reɪl	ræl	Rail bus
4	paʊdə(r)	pʰɔdèr	Powder
5	pəˈliːs	pʊlʊs	Police
6	ˈhɒspɪtl	hɑs.pɑ.tɑl	Hospital
7	brʌʃ	bu.ɾuʃ	Brush
8	draɪvər	dɪraɪvær	Driver
9	self	sɪ.lɪf	Self
10	bʌlb	bɑlɑp	Bulb
11	bɒks	bɑkɑs	Box
12	hɔːrn	hɑ.rèn	Horn
13	sɪg.ərˈet	sɪk. ret	Cigarette
14	træk.tər	tek.tèr	Tractor
15	məʊtə(r)saɪkl	mətsɪkèl	Motorcycle
16	rəʊd	rət	Road
17	æksɪdənt	eksɪdæ̃n	Accident
18	dʒeɪl	dʒiːl	Jail
19	kəʊtʃ	kɔːtʃ	Coach
20	plɑː.stər	pɑ.lɑs.tèr	Plaster
21	endʒɪn	ɪndʒæ̃n	Engine
22	pʌŋktʃər	pɑn.tʃèr	Puncture

A2: Activities Schedule for the Proposed Study

S/No	Activities	Timeframe of Implementation
01	Search and selection of the topic	10th February 2022 to 1st March 2022
02	Selection of supervisor	2nd March 2022
03	Submission of proposal for GAC	14th April 2022
04	12th GAC meeting	17th June 2022
05	Meeting minutes of 12th GAC	7th July 2022
06	Submission of proposal for FBS with amendments	3rd August 2022
07	11th FBS meeting (1st)	27th October 2022
08	Meeting minutes of 11th FBS	1st November 2022
09	Submission of proposal for 2nd FBS with amendments	2nd January 2023
10	12th FBS meeting (2nd)	14th April 2023
11	Meeting minutes of 12th FBS	17th April 2023
12	Submission of proposal for BASR	22nd May 2023
13	Approval from BASR	6th July 2023
14	Thesis Submission	15th August 2023
15	External Examiner's Report	28th November 2023
16	Internal Examiner's Report	15th December 2023
17	Thesis Submission for Final Defense	26th December 2023
18	Thesis Defense	13th February 2024
19	Submission of Hardbound Copies of Thesis	

A3: Loanwords' Adjustment Using Different Adaptation Strategies

Serial no	IPA Transcription	Khowar	Gloss	
Substitution				
1	kɒlɪdʒ	kalɪdʒ	College	/ɒ/ → [a], / dʒ / → [tʃ]
2	bæŋk	bæ̃ŋk	Bank	/ æ / → [æ̃]
3	dɒktər	dak.ʈʰɑːr	Doctor	/ ɒ / → [a], / ə / → [aː]
4	mʌg	mak	Mug	/ g / → [k], / ʌ / → [a]

5	keɪk	kek	Cake	/ eɪ / → [e]
6	bæg	bek	Bag	/g/ → [k], /æ/→[e]
7	rekɔːd	rɪ.kɑːt	Record	/ e / → [ɪ], /ɔː/ → [ɑː], /d/ → [t]
8	kəʊtʃ	kɔːtʃ	Coach	/əʊ/ → [ɔː]
9	rəʊd	rɔt	Road	/əʊ/ → [ɔ], / d / → [t]
10	hɒstəl	hɑstèl	Hostel	/ə/ →[è], / ɒ / → [ɑ]
11	ˈhɒspɪtl	hɑs.pɑ.tɑl	Hospital	/ɑː/→[ɑ], / ɪ / → [ɑ], / ə / → [ɑː]
12	rʌbər	rɑbʊł	Rubber	/ʌ/ → [ɑ], /ə/ → [ʊ], /r/ → [ł]
13	bəʊ.lər	bɑ.lèr	Bowler	/ əʊ / → [ɑ], /ə/ → [è]
14	vəʊt	vɔːt	Vote	/ əʊ / → [ɔː]
15	kəʊt	kɔt	Coat	/ əʊ / → [ɔ]
16	həʊˈtel	hɔ. tèl	Hotel	/əʊ/ → [ɔ], /e/ → [è]
17	bʌŋgələʊ	bɑ̃ŋ.gɑ.lɑ	Bungalow	/ ʌ / → [ɑ̃], /ə/ → [ɑ] /əʊ/ → [ɑ]
18	məʊ.tər	mɔ.tèr	Motor	/ əʊ / → [ɔ], /ə/ → [è]
19	ləʊd	lɔːt	Load	/ əʊ / → [ɔː] /d/ → [t]
20	pəʊ.stər	pɔs.tèr	Poster	/ əʊ / → [ɔ], /ə/ → [è]
21	fəʊtəʊ	fʊtʊ	Photo	/ əʊ / → [ʊ], / əʊ / → [ʊ]
22	ˈtel.ɪ.fəʊn	tɪ.lɪ.fūːn	Telephone	/ e / → [ɪ], / əʊ / → [ūː]
23	dʒeɪl	dʒiːl	Jail	/ eɪ / → [iː]
24	reɪl	rèl	Rail	/ eɪ / → [è]
25	peɪ.pər	pe. pɑːr	Paper	/ eɪ / →[e], /ə/ →[ɑː]
26	geɪt	gèt	Gate	/ eɪ / → [è]
27	reɪ.di.əʊ	re.diʊ	Radio	/ eɪ / → [e], / əʊ / → [ʊ]
28	səˈluːt	sʊlʊt	Salute	/ə/ → [ʊ], /uː/ → [ʊ]
29	mɑːstər	mɑʃtèr	Master	/ɑː/→ [e], /s/ → [ʃ], /ə/ →[è]
30	pɒlɪʃ	pɑ.lɪʃ	Polish	/ɒ/→[ɑ]
31	feɪl	fel	Fail	/ eɪ / → [e]
32	paʊdər	pʰɔd èr	Powder	/ aʊ / → [ɔ], / ə / → [è]
33	taɪm	tèm	Time	/ aɪ / → [è]
34	pəˈliːs	pʊlʊs	Police	/ ə / → [ʊ], / iː / → [ʊ]
35	endʒɪn	ĩndʒæ̃n	Engine	/ e / → [ĩ], / ɪ / → [æ̃]
36	bɔː.dər	bɑ.d è r	Border	/ ɔː / → [ɑ], / ə / → [è]

Epenthesis				
1	skuːl	ɪs.kuːl	School	Ø →[ɪ]
2	stɔː(r)	ɪs.tɔːr	Store	Ø →[ɪ]
3	klɪnɪk	kɪlɪnɪk	Clinic	Ø →[ɪ]
4	klɪp	kɪlɪp	Clip	Ø →[ɪ]
5	klɑːs	kɪlɑːs	Class	Ø →[ɪ]
6	ɡlɑːs	ɡɪlɑːs	Glass	Ø →[ɪ]
7	fɪlm	fɪliːm	Film	Ø →[ĩ]
8	bʌtn	bʌt è n	Button	Ø →[è]
9	slɪp	sɪ.lɪp	Slip	Ø →[ɪ]
10	stuːl	ɪs.tuːl	Stool	Ø →[ɪ]
Substitution and Epenthesis				
1	brʌʃ	bu.ɾuʃ	Brush	Ø → [ʊ], /ʌ/ → [ʊ]
2	plæstɪk	pɑlɑstɪk	Plastic	Ø → [ɑ], / æ / → [ɑ], /s/ → [ʃ]
3	pleɪt	pɪlet	Plate	Ø →[ɪ], / eɪ / → [e]
4	sleɪt	sɪlet	Slate	Ø → [ɪ], / eɪ / → [e],
5	steɪ.plər	Is.tep.l è r	Stapler	Ø → [ɪ], / eɪ / → [e], / ə / → [è]
6	draɪvər	dɪraɪvær	Driver	Ø → [ɪ], / ə / → [æ]
7	əˈlɑːrm	ɑlɑ.rɑm	Alarm	Ø → [ɑ], / ə / → [ɑ]
8	skaʊt	ɪs.kɒt	Scout	Ø → [ɪ], / aʊ / → [ɔ]
9	self	sɪ.lɪf	Self	Ø → [ɪ], / e / → [ɪ]
10	plɑː.stər	pɑ.lɑs.t è r	Plaster	Ø → [ɑ], / ɑː / → [ɑ], / ə / → [è]
11	bʌlb	bɑlɑp	Bulb	Ø →[ɑ], / b / → [p]
12	bɒks	bɑkɑs	Box	Ø → [ɑ], / ɒ / → [ɑ]
13	hɔːrn	hɑ.r è n	Horn	Ø → [è], / ɔː / → [ɑ]
14	slɪpə(ɾ)	sɪlɪpær	Slipper	Ø → [ɪ], / ə / → [è]
15	bɒtl	bʊθaːl	Bottle	Ø → [ɑː], / ɒ / → [ʊ], /t/ → [θ]
Deletion				
1	sɪˈment	sɪˈmet	Cement	n →[Ø]
2	ɡrɑːs	ɡɑːs	Grass	r →[Ø]
Deletion and Substitution				

1	bɔːrd	bɔːt	Board	/r/ → Ø, / d / → [t]
2	kɑːrd	kɑːt	Card	/r/ → Ø, / d / → [t]
3	pɪə.rɪ.əd	pe.ret	Period	/ə/ → Ø,/ ɪ/ → [e]
4	æksɪdənt	eksɪdæ̃n	Accident	/ t / → [Ø], / æ /→[e], / ə / → [æ̃]
5	juːnɪˈvɜːrsəti	juːnɪʊestɪ	University	/r/, /ə/ → Ø, /v/→[ʊ], /ɜː/ →[e]
6	læntə(r)n	lɑ.t è n	Lantern	/n/,/r/→Ø, /æ /→ [ɑ], / ə /→ [è]
7	gɑːrd	gɑːt	Guard	/r/→Ø, / d /→[t]
8	laʊdˈspiː.kər	lɔs.pɪ.k è r	Loudspeaker	/d/→Ø, /aʊ /→[ɔ],/iː/→[ɪ], /ə/→[è]
9	sɪg.ərˈet	sɪk. ret	Cigarette	/ə/→Ø, /g /→[k]
10	træk.tər	tek.t è r	Tractor	/r/→Ø, /ə/→[è]
11	kɒntækt	kɑn.tek	Contact	/t / → Ø, / ɒ / → [ɑ], / æ / → [e]
12	pʌŋktʃər	pɑn.tʃ è r	Puncture	/k / → Ø, / ʌ / → [ɑ], / ə / → [è]
Multiple Processes				
1	stjuːdnt	istʊdæ̃n	Student	[Ø]→/ɪ/,/j/,/t/→[Ø],/uː/→[ʊ],/ə/→[æ̃]
2	tʊənəmənt	tɔr.nɑ.mæ̃n	Tournament	/t/→[Ø],[Ø]→r,/ʊə/→[ɒ],/ə/→[ɑ],/ə/→ [æ̃]
3	glɪs.ər.ɪn	ge.les.rɪːn	Glycerine	/ə/→[Ø],Ø→[e],/ɪ/→[e],/e/ → [ɪː]
4	krɪkɪt	kɪrket	Cricket	/ɪ/ → [Ø], Ø→[ɪ], /ɪ/ → [e]
5	prəʊgræm	pʊrgɑːm	Program	/əʊ/→[Ø],/r/→[Ø],Ø →[ʊ],/æ/→ [ɑː]
6	mænɪdʒə(r)	mɑndʒ è r	Manager	/ɪ/→[Ø],Ø→[r], /æ/→[ɑ],/ə/→[è]
7	məʊtərsaɪkl	mɔtsɪk è l	Motorcycle	[Ø]→/è//ə/→[Ø],/r/→[Ø],/əʊ/→[ɔ],/aɪ/ → [e],/ə/→/è/

A4: Observation Sheet used for Participant Observation

Observation Sheet

Place of Observation……

Day: ..... Observer: .....

Date: ..... Time: .....

Name of Participant …… (Optional)

Reflective note

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Observation Report

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Loanwords Collected:

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