About phonetic-phonological rules of the vowels in Khorchin

Saiyinjiya Caidengduoerji
(Centre de recherche linguistique sur l'Asie orientale, Paris)

Abbreviations and symbols

Grammatical forms

ABL	ablative case: /-ɯs/
ACC	accusative case: /-ig/
AGENT	agentive suffix: /-š/
AGENT. VN	agentive verbal noun: /-gš/
CAUS	causative verbal suffix: /-ɯ/ ~ /-gɯ/
COM	comitative case: /-tɛ/
HYP. VN	hypothetical verbal noun: /-x/
IMM. PAST. IND	immediate past indicative: /-lɯ/
INST	instrumental case: /-ɯr/
NOMLZ	nominalizer derivational suffix: /-šɯ/, /-l/
PL	plural: /-Ud/ ~ /-šUd/
PLR	plural verbal suffix: /-ʤga/
PRES	present indicative: /-nɯ/
RFL	reflexive possessive: /-ɯn/~/-n/
PAST. VN	past verbal noun: /-sn/
VBLZ	verbalizer derivational suffixes: /-l/, /-sgɯ/, /-ʤga/

Other Abbreviation

ATR	advanced tongue root

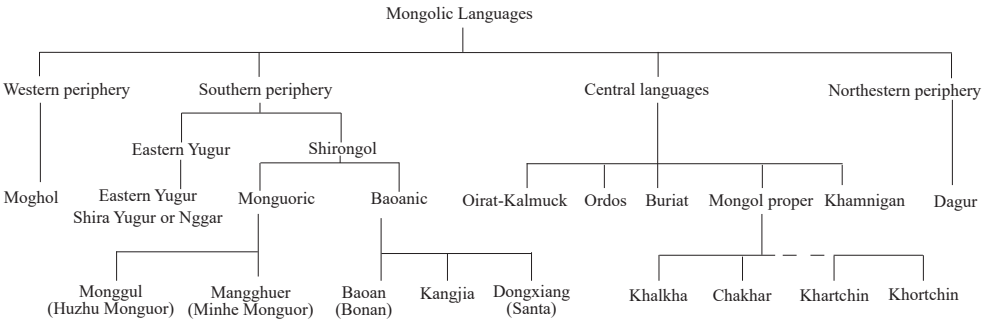
Symbols

·	syllable boundary
/…/	phonological representation
[…]	phonetic form
[ː]	long (vowel length)

1. Introduction

1.1. Place of Khorchin in the Mongolic languages

Khorchin belongs to the Mongolic branch of the Altaic language family. Its situation in this family is shown in the table below. (Hans Nugteren 2011 p. 22)



1.2. Geographical location of the Khorchin domain

Khorchin is spoken in China, mainly in the Inner Mongolia Autonomous Region. This region counts about 4,426,000 Mongols, in other words 74% of the Mongolian population of China.[1] However Mongolian represent only 17.1% of the total population of the autonomous region. Most Mongols are bilingual in Mongolian and Chinese, but in urban younger generations Mongolian language was disappearing, a trend that might be changing.

The Khorchins constitute the majority group among the Mongolian population of the Inner Mongolia Autonomous Region. They number 2,080,000, that is to say 52% of the Mongolian speaking population.[2] They are particularly sinicized. The common official language of the Mongolians of China is not based on the Khorchin dialect, but on the Chakhar.

In Inner Mongolia, the Khorchins reside in Tongliao municipality (previously Zirem League), which includes the Darkhan banner, and also in the Khingan league, forming closed communities. Only in Tongliao there are 1,441,000 Khorchins.[3]

There are also Khorchins in China's Heilongjiang Province in Dörbed District (see 1 on map 1), and in Jilin Province's Gorlos District (see 2 on map 1). Moreover, Khorchins are numerous in the administration and are found all over Inner Mongolia as civils servants, teachers.

They live in a closed network and have a strong sense of identity through the preferential use of Khorchin over standard Mongolian.

Due to its particular political and geographical location, Khorchin has been in contact with the Manchu and Chinese languages, but also with Mongolian dialects;

[1] YANG Guoqing, "Zhongguo mengguzu renkou qianyi fenxi" [Analysis of the migration patterns of the Mongol of China], Zhongguo Tongji, 7, Beijing, Zhongguo tongji chubanshe, 2013, p. 9-10.

[2] Sečinbaγatur (dir.), *Mongγul kelen-ü nutuγ-un ajalγun-u sinzilel-ün uduridqal* [Introduction to the dialectology of the Mongolian language], Hohhot, Öbür mongγul-un arad-un keblel-ün qorij=a, 2005, p. 317.

[3] YANG Guoqing, Op. cit.

thus, the Kharachin dialect, itself strongly influenced by Chinese,[4] has had a major influence on Khorchin.

Finally, the Khorchins, whether monolingual or bilingual Chinese-Khorchin, use a large number of Chinese loan words.

Map 1: The Khorchins of the Darkhan banner

1.3. Methodology

The Khorchin dialect is not uniform. I chose to study the variety of Khorchin dialect spoken in the city of Baokang and the neighboring villages (see Map 1). In order to obtain a representative sample, I interviewed bilingual Sino-Khorchin speakers of different ages and sexes, including some who had had little access to the standard Mongolian language. The recordings[5] of the interviews were made in several stages:

Step 1: I asked each speaker to read a lexical corpus aloud (3000 terms belonging to the basic vocabulary common to all Mongolian languages).

Step 2: From free interviews with the same speakers, I established a specific vocabulary of the Khorchin dialect from daily life.

Step 3: I asked the same speakers to repeat the selected terms.

This method aimed to see if the pronunciation of the terms was stable within the same geographical area.

[4] Currently, most Kharchins speak only Chinese.

[5] We used a TASCAM / DR-100 portable digital tape recorder to record language material.

To achieve my objective of giving a synchronic description of the Khorchin dialect of Baokang, I used Praat software. This made it possible to clarify certain phenomena that linguists who had previously worked on this subject had not been able to.

1.4. Previous work on the phonology and phonetics of Khorchin

Most previous work has been carried out by Khorchin researchers, and mainly before 1990. The authors do not distinguish between phonology and phonetics, but their studies are more phonetic (Bajančoɣtu, 2002). On the other hand, they include in the phonological system of Khorchin phonemes that can only be found in borrowed words (Bajančoɣtu, 2002, Tulɣaɣur and Sodu, 2008). Since these researchers do not distinguish between phonetics and phonology, the notion of epenthetic vowel escapes them: they speak of non-initial vowels that are reduced.

Bajančoɣtu (2002) gives the following table:

Vowels		
Short (11)	Long (9)	Diphthongs (11)
[ɑ], [ë], [i], [ɔ], [ʊ], [u], [ɛ], [œ], ([y]), [ə], [ɚ], [ər]	[ɑː], [əː], [iː], [ɔː], [ʊː], [uː], [ɛː], [œː], [yː]	[ʊɑː], [ʊɛː], [uɛː], [iaː], [yɛ], [ui], [iɔ], [əi], [ai], [uə], [ʊai]

Table 1: Presentation of Khorchin vowels according to Bajančoɣtu (2002)

Note that the table includes phonemes only present in words borrowed from Chinese (the majority of borrowed words), Tibetan (few borrowed words) and European languages (few).

Tulɣaɣur and Sodu (2008) give the following table:

Vowels	
Short (8)	Long (12)
[ɑ], [ɤ], [i], [ɔ], [ʊ], [u], [ɛ], [œ]	[ɑː], [əː], [iː], [ɔː], [ʊː], [uː], [ɛː], [œː], [yː], [ʊaː], [uəː], [uɛː]

Table 2: Presentation of Khorchin vowels according to Tulɣaɣur and Sodu (2008)

Chaganhada (1996) noted ten phonological vowels: /ɑ/, /ə/, /i/, /ɔ/, /ʊ/, /u/, /y/, /ɛ/, /œ/, /ɚ/.

As for Norzin (1998), he lists nine short vowels for the Khorchin dialect: [ʌ], [ə], [i], [ɔ], [ʊa], [u], [ʊ], [ɛ], [œ], but does not note the consonants.

N.B.: in my work, only Khorchin phonemes were taken into consideration.

2. The vowel system

In the first syllable (or initial syllable), According to our analysis Khorchin has eight pairs of vowels. They are distinct in their quantity which makes it possible to oppose them term by term:

— a series of short[6] vowels: /ɯ/, /i/, /u/, /ɑ/, /ɛ/, /ʊ/, /ɔ/, /œ/

— a series of long vowels: /ɯɯ/, /ii/, /uu/, /ɑɑ/, /ɛɛ/, /ʊʊ/, /ɔɔ/, /œœ/.

Notes:

— the eight short vowels may, in some cases, have a reduced realization, noted as follows: [ŭɯ], [ĭ], [ŭ], [ă], [ĕ], [ŏ], [ŏ], [œ̆]

— he short / long distinctive opposition exists only in the first syllable.

In non-initial syllables, we find only the eight short vowels given above. Among them, only two have a reduced realization: [ə̆], [ĭ].

Cases of epenthetic vowels (studied below):

It should be noted that these vowels have no phonological value and will not be noted in our phonological transcription. They appear, for phonetic reasons, in the syllabification of a word. They correspond to the two reduced vowels (see below).

2.1. Short vowels

The eight short vowels (/ɯ/, /i/, /u/, /ɑ/, /ɛ/, /ʊ/, /ɔ/, /œ/) are differentiated by the feature/traits:

— ±ATR (advanced or retracted tongue root)

— ±front

— ±open

— ±rounded

Some are distinguished from each other by two or three features. Others are distinguished only by a single feature, which makes their auditory differentiation delicate for non-Khorchins.

The feature of ±ATR distinguishes the two vowel classes.

— +ATR, advanced tongue root: /i/, /ɯ/, /u/

— -ATR, retracted tongue root: /ɛ/, /œ/, /ʊ/, /ɑ/, /ɔ/

The feature of ±front distinguishes between

— front: /i/, /ɛ/, /œ/

— back: /ɯ/, /u/, /ʊ/, /ɑ/, /ɔ/

The feature of ±open distinguishes between

— close: /i/, /ɯ/, /u/, /ʊ/

— open: /ɛ/, /œ/, /ɑ/, /ɔ/,

The feature of ±rounded depends on the shape formed by the lips and distinguishes

— unrounded: /i/, /ɯ/, /ʊ/, /ɛ/, /ɑ/

— rounded: /œ/, /u/, /ɔ/

1) The +ATR vowels, namely /i/, /ɯ/, /u/, are the most closed. In their acoustic realization, the first formant of the sound spectrum, F1, has a low frequency. On the

[6] Say also full vowels, cf. Svanteson, Tsendina, Karlson and Franzén 2008:3.

other hand, the vowels /ɯ/ and /u/ are realized in the posterior part of the oral cavity, the vowel [ɯ] being realized more or less centrally according to the speakers.

The first formants (F1) of the realizations of the vowels -ATR, namely /a/, /ɛ/, /ɔ/, /œ/, /ʊ/, have higher frequencies than those of the vowels +ATR. Phonetically, the vowels /ɛ/ and /œ/ are realized in the anterior part of the oral cavity and the vowels /ɑ/, /ɔ/, /ʊ/ are realized in the central or posterior part of the oral cavity.

2) The vowel /ʊ/ is, phonologically, unrounded, although realized with relatively rounded lips.

		Front		Back	
		Unrounded	Rounded	Unrounded	Rounded
Close	+ATR	i		ɯ	u
	-ATR			ʊ	
Open	+ATR				
	-ATR	ɛ	œ	ɑ	ɔ

Table 3 Phonological vowels of Khorchin

The opposition between the different vowels is manifested in series of minimal pairs:

/sɯr-/	"wake up"
/sur/	"majesty"
/sar/	"month"
/sʊr-/	"study"
/sɔr-/	"absorb"
/xir/	"dirty"
/xar/	"black"
/xɛr/	"foreigner"
/xʊr/	"rain"
/xɔr/	"poison"
/xœr/	"twenty"

I noticed that there are very few minimal pairs opposing the vowels /ɛ/ and /œ/.

2.2. Long vowels

All the short vowels of the Khorchin have corresponding long vowels. These long vowels occur only in a first syllable. I note them by doubling the sign for the corresponding short vowel:

/ɯɯ/, /ii/, /uu/, /ɑɑ/, /ɛɛ/, /ʊʊ/, /ɔɔ/, /œœ/.

Their phonetic realizations will be noted by the IPA symbol of the corresponding short vowel followed by the symbol: Note that their duration is generally twice as long as that of the corresponding short first syllable.

There is a length opposition between vowels, as illustrated by the following minimal pairs:

/dɯɯr/	"above"	≠	/dɯr/	"pillow"
/biir/	"brush"	≠	/bir/	"stepchild"
/uud/	"door"	≠	/ud/	"feather"
/ɑɑb/	"father"	≠	/ɑb/	"take (it)!"
/xɛɛr/	"love"	≠	/xɛr/	"foreign"
/ʊʊl/	"mountain"	≠	/ʊl/	"sole of the foot"
/tɔɔs/	"dust"	≠	/tɔs/	"oil"
/œœr/	"close"	≠	/œr/	"debt"

2.3. Epenthetic vowels

Among studies of the non-initial short vowels of the Mongolian language, there are two theories. According to the first one, as illustrated by Marie-Lise Beffa and Roberte Hamayon, in Khalkha, "short vowels keep their timbre in a first syllable. In the following syllables, they lose timbre and length. For example: /baatar/: [bātᵊr] 'hero'", and when some suffixes are added non-initial short vowels can be lost (Beffa and Hamayon, 1975, p.44). On the other hand, according to Annie Rialland and Redouane Djamouri's (1984) presentation of vowel harmony in the Khalkha dialect, "the derivational suffixes can only be consonantal; epenthetic vowels are inserted between the consonants so as to form syllables [...]. Epenthetic vowels do not appear at the phonological level. Only vowels and phonological consonants are present (Rialland and Djamouri 1984 p. 338).

As mentioned above, my analysis of Khorchin vowels distinguishes two types of non-initial syllables: those with reduced realization and those with short but unreduced realization.

Note: Remember that there are no long vowels in non-initial syllables.

Reduced vowels are often in a closed syllable. They are unstable and they are lost when suffixes starting with a vowel are added:

[ɑ · rə̆d̥] "people" + ABL → [ɑr · dɑs]

Exception: this phenomenon does not occur when the syllable is closed by the velar consonant [ŋ] or a bi-consonantal cluster:

[sɔ · lə̆ŋ] "rainbow" + ABL → [sɔ · lə̆ŋ · gɔs]
[ɑ · sə̆g̊ʃ] "what takes the action of burning" + ABL → [ɑ · sə̆g̊ · ʃɑs]

These vowels with reduced realization are actually epenthetic vowels (unstable, non-distinctive, purely phonetic), which intervene only for syllabification (see below). There are two in Khorchin: [ə̆], [ĭ]. Examples:

[tɯ · rə̆g̊], realization of /tɯrg/
[ʃu · lə̆g̊], realization of /šulg/
[ɑ · rə̆d̥], realization of /ɑrd/
[sɔ · lə̆ŋ], realization of /sɔlŋ/
[ʊ · rə̆g̊], realization of /ʊrg/

[ɛ · də̆l], realization of /ɛdl/
[gɑ · ʤĭr], realization of /gaʤr/

Note that after a palatal consonant, epenthetic is always [ĭ].

Note the two following points:

— It is important to underline that these epenthetic vowels are always found in non-initial syllables. However short vowels with reduced realization can be found in an initial syllable.

— In the following examples – which, for those indicated by a), illustrate this distinction and, for those indicated by a b), explain the operation of epenthetics –, I have noted epenthetic vowels in bold and the fact that they do not appear with the symbol ↓.

1.a) On the root /mud-/ "know", the opposition:
/mud-l/ [mu · də̆l] "knowledge" vs /mud-ul-/ [mŭ · dul] "let [sb.] know!"

1.b) And adding the ablative suffix /-Ɯs/ to the base /mud-l/:
/mud-l/ [mu · də̆l] + /-Ɯs/ → /mud-l-Ɯs/ [mŭd↓ · lɯs]

The epenthetic [ə̆] no longer appears, and the vowel /u/ of the root is realized [ŭ] (as followed by an unreduced vowel syllable [lɯs]).

2.a) /ibl-/ [i · bə̆l] "gives (us) a lot of milk! " vs /ibɯl/ [ĭ · bɯl] "protection"

2.b) /ibl-/ [i · bə̆l] + /-x/ HYP. VN → /ibl-x/ [ib↓ · lə̆x]

3.a) /uxr/ [u · xə̆r] "cow" vs /uxɯr/ [ŭ · xɯr] "corpse"

3.b) /uxr/ [u · xə̆r] + /-Ɯs/ ABL → /uxr-Ɯs/ [ŭx↓ · rɯs]

4.a) /dɯɯs (n)/ [dɯː · sə̆n] "rope" + /-Ɯn/ RFL → /dɯɯs (n) -Ɯn/ [dɯː · sɯn] "(his) own rope"

The epenthetic [ə̆] and unstable *n* no longer appear.

4.b) /dɯɯs (n)/ [dɯː · sə̆n] + /-Ɯs/ ABL → /dɯɯs (n) -Ɯs/ [dɯːs · nɯs]

The epenthetic [ə̆] no longer appears and the unstable *n* does not fall.

5.a) Compare:

/ɑs/ [ɑs] "burn, consume yourself!"+ /-gš/ AGE → /ɑs-gš/ [ɑ · sə̆g̊ʃ] "what is burned, what is consumed"

/ɑs-A-/ [ă · sɑ] "burn! fire!" (With /-Ɯ/ CAUS) + /-gš/ → /ɑs-A-gš/ [ă · sɑg̊ʃ] "what makes the action of burning, what is burning"

The opposition /ɑs-gš/ [ɑ · sə̆g̊ʃ] vs /ɑs-A-gš/ [ă · sɑg̊ʃ]

5.b) /ɑs-gš/ [ɑ · sə̆g̊ʃ] + /-Ɯs/ ABL → /ɑs-gš-Ɯs/ [ă · sə̆g̊ · ʃɑs],

The epenthetic does not fall.

Remarks

1) There are also reduced vowels in loanwords.

E.g. the word "chair", *sandali* in Uyghur-Mongolian script, a term of Persian origin borrowed via the Turkic languages. In Khorchin, the second vowel of this term

is reduced and the final vowel falls; it is realized [sɑn · dəl] ~ [sɛn · dəl]. This second vowel falls when we add suffixes beginning with a vowel: [sɑnd · lɑs] ~ [sɛnd · lɑs] (ablative) and remains when the suffix begins with a consonant: [sɑn · dəl · tə] ~ [Sɛn · dəl · tɛ] (in the comitative).

2) Speakers do not always pronounce epenthetic vowels, e.g. /umd/ "trousers", pronounced [u · mə̆d̥] or [umd̥]; /xɑgd/ "half", pronounced [xɑ · gə̆d̥] or [xɑgd̥]; /ɑrd/ "people", pronounced [ɑ · rə̆d̥] or [ɑrd̥].

2.4. Phonetic length of vowels according to their position

According to my observations, the vowels are realized with different lengths according to their position. There are three types of realization: short, reduced, long (example: [ɑ], [ă], [ɑː]). In initial syllables, I found all three types. In non-initial syllables, I found only the short type and the two reduced vowels [ĭ] and [ə̆]; I found no long vowels in non-initial syllables.[7]

Analysis of the duration of the vowels in initial syllables (in bold), according to whether they are short, reduced or long:

Short vowels [ɯ], [i], [u], [ɑ], [ɛ], [ʊ], [ɔ], [œ]

	Terms	Duration 1st V	Duration 2nd V
/ɯ/	/ɯr/ [ɯr] "male"	**0.077 s.**	
/ɯ/	/gɯr/ [gɯr] "house"	**0.069 s.**	
/i/	/id/ [id̥] "eat!"	**0.080 s.**	
/i/	/xil/ [xil] "border"	**0.059 s.**	
/u/	/us/ [us] "hair"	**0.072 s.**	
/u/	/nux/ [nux] "hole"	**0.061 s.**	
/ɑ/	/ɑb/ [ɑb̥] "take it!"	**0.080 s.**	
/ɑ/	/dɑl/ [dɑl] "seventy"	**0.075 s.**	
/ɑ/	/bɑgɑ/ [bɑ · ˈgɑ] "small"	**0.074 s.**	0.086 s.
/ɛ/	/lɛbš/ [lʲɛb̥ʃ] "leaf"	**0.070 s.**	
/ɛ/	/ɛm/ [ɛm] "life"	**0.104 s.**	
/ɛ/	/nɛrn/ [nʲɛrn] "narrow"	**0.090 s.**	
/ʊ/	/ʊs/ [ʊs] "water"	**0.089 s.**	
/ʊ/	/ʤʊn/ [ʤʊn] "summer"	**0.090 s.**	
/ɔ/	/ɔr/ [ɔr] "bed"	**0.091 s.**	
/ɔ/	/tɔs/ [tʰɔs] "oil"	**0.069 s.**	
/œ/	/xœb/ [χœb̥] "destiny"	**0.082 s**	
/œ/	/œx/ [œx] "(the) best"	**0.082 s.**	

Duration of short vowels

[7] This is also the case in Oirat.

The average lengths of the short vowels are shown below:

Vowels	ɯ	i	u	ɑ	ɛ	ʊ	ɔ	œ
Duration	0.075	0.066	0.067	0.076	0.088	0.076	0.080	0.085

In Khorchin, a short initial vowel of one syllable measures on average 0.076 s, approximately the same length as in Khalkha, where it lasts on average 0.066 s. (Svantesson J.-O., Tsendina A., Karlsson A., Franzén V., 2005, 3).

Reduced vowels: [ŭɯ], [ĭ], [ŭ], [ă], [ɛ], [ŏ], [ɔ̆], [œ̆]

	Terms	Duration 1st V	Duration 2nd V
/ɯ/	/tɯmɯ/ [tʰŭɯ · ˈmɯ] "camel"	**0.039 s.**	0.081 s.
/ɯ/	/bɯlɯn/ [bŭɯ · ˈlɯn] "lukewarm"	**0.034 s.**	0.096 s.
/i/	/bilu/ [bĭ · ˈlu] "whetstone"	**0.059 s.**	0.087 s.
/i/	/dimi/ [dĭ · ˈmi] "futile"	**0.030 s.**	0.077 s.
/u/	/xudɯ/ [xŭ · ˈdɯ] "campaign"	**0.044 s.**	0.111 s.
/u/	/šulɯ/ [ʃŭ · ˈlɯ] "free"	**0.043 s.**	0.084 s.
/ɑ/	/ɑdʊ/ [ă · ˈdʊ] "horses"	**0.042 s.**	0.083 s.
/ɑ/	/dɑrɑ/ [dă · ˈrɑ] "after"	**0.045 s.**	0.091 s.
/ɛ/	/bɛdʊ/ [bʲĕ · ˈdʊ] "poor"	**0.043 s.**	0.081 s.
/ɛ/	/tɛrɛ/ [tʰʲĕ · ˈrɛ] "wheat"	**0.045 s.**	0.087 s.
/ɛ/	/jɛrɛ/ [jĕ · ˈrɛ] "word"	**0.053 s.**	0.083 s.
/ʊ/	/dʊlɑn/ [dŏ · ˈlɑn] "warm"	**0.043 s.**	0.082 s.
/ʊ/	/ʤʊrgɑ/ [ʤŏr · ˈgɑ] "six"	**0.054 s.**	0.069 s.
/ʊ/	/ʊtɑ/ [ŏ · ˈtʰɑ] "smoke"	**0.045 s.**	0.074 s.
/ʊ/	/bʊgɑ/ [bŏ · ˈgɑ] "wrist"	**0.049 s.**	0.076 s.
/ɔ/	/ɔrɔ-x/ [ɔ̆ · ˈrɔχ] "wrap"	**0.064 s.**	0.087 s.
/ɔ/	/ɔd-ʊd/ [ɔ̆ · ˈdʊ̥d] "stars"	**0.039 s.**	0.061 s.
/œ/	/œrœ/ [œ̆ · ˈrœ] "night"	**0.042 s.**	0.083 s.
/œ/	/dœrœ/ [dœ̆ · ˈrœ] "weak"	**0.041 s.**	0.086 s.

Duration of reduced vowels

Examples of vowel duration in trisyllabic roots. Compare:

/ɑ/	/ɑrmʤɑ/ [ă · rə̆m · ˈʤɑ] "rope"	0.043 s.	0.043 s.	0.097 s.
/ɑ/	/bɑlbrxɑ/ [bɑl · bə̆r · ˈχɑ] "fragment"	0.070 s.	0.033 s.	0.087 s.

The average durations of reduced vowels are presented below:

Vowels	ŭɯ	ĭ	ŭ	ă	ĕ	ŏ	ɔ̆	œ̆
Duration	0.037	0.048	0.044	0.049	0.043	0.052	0.055	0.056

A reduced vowel averages 0.048 seconds.

Long vowels: [ɯː], [iː], [uː], [aː], [ɛː], [ʊː] [ɔː], [œː]

	Terms	Duration 1st V	Duration 2nd V
/ɯɯ/	/ɯɯx/ [ɯːx] "fat"	0.218 s	
/ɯɯ/	/dɯɯs/ [dɯːs] "rope"	0.159 s.	
/ii/	/iim/ [iːm] "so"	0.211 s.	
/ii/	/biil/ [biːl] "gums"	0.130 s.	
/uu/	/uud/ [uːd̥] "door"	0.165 s.	
/uu/	/uul/ [uːl] "cloud"	0.169 s.	
/ɑɑ/	/ɑɑš/ [ɑːʃ] "character"	0.158 s.	
/ɑɑ/	/sɑɑd/ [sɑːd̥] "obstacle"	0.217 s.	
/ɑɑ/	/bɑɑtr/ [bɑːˑˈtʰər] "hero"	0.181 s.	0.048 s.
/ɛɛ/	/xɛɛš/ [xɛːʃ] "scissors"	0.133 s.	
/ɛɛ/	/gɛɛl/ [gɛːl] "tax"	0.159 s.	
/ɛɛ/	/ɛɛmg/ [ɛːˑˈmə̆g] "tribe; division"	0.153 s.	0.052 s.
/ʊʊ/	/ʊʊt/ [ʊːtʰ] "bag"	0.179 s.	
/ʊʊ/	/xʊʊšn/ [χʊːˑˈʃĭn] "old"	0.133 s.	0.064 s.
/ɔɔ/	/ʤɔɔs/ [ʤɔːs] "coins, money"	0.182 s.	
/ɔɔ/	/tɔɔs/ [tʰɔːs] "dust"	0.188 s.	
/œœ/	/œœ/ [œː] "forest"	0.212 s.	
/œœ/	/xœœn/ [xœːn] "behind"	0.158 s.	

Duration of long vowels

The average lengths of long vowels are shown below:

Vowels	ɯː	iː	uː	ɑː	ɛː	ʊː	ɔː	œː
Duration	0.172	0.170	0.167	0.185	0.153	0.161	0.185	0.185

A long vowel lasts an average of 0.147 seconds.

2) In the first syllable, a short vowel is usually reduced when it is followed by another short vowel, which will itself not be reduced.

Note that the duration of reduced vowels in initial syllables is about half the duration of the following short vowel:

/gɑr/ "main" + /-Ɯs/ ABL	→	/gɑr-Ɯs/
[gɑr]	→	[gə̆ · rɑs]
[ɑ] = 0.080 s.		[ə̆] = 0.059 s.; [ɑ] = 0.117 s.

Note:

In disyllabic words,

– the two vowels can be reduced if the second syllable is closed:

/mɯrgn/	[mə̆r · gə̆n]	"smart"
/xœl-x/	[xœ̆ · lə̆χ]	"mix"

– none of the vowels is reduced if the two syllables are open:

/bɑgɑ/	[bɑ · gɑ]	"small"[8]

[8] Note that in Oirat, Chakhar and Khalkha, the term "small" is realized in one syllable: [bay̆].

/sɑlɑ/	[sɑ · lɑ]	"branch"
/sɑnɑ/	[sɑ · nɑ]	"thought"

3) A long vowel remains about the same duration in any syllabic context (monosyllabic or plurisyllabic word):

/dɯɯr/ "up" + /-ᗰs/ ABL	→	/dɯɯr-ᗰs/
[dɯːr]	→	[dɯː · rɯs]
[ɯː] = 0.183 s.		[ɯː] = 0.167 s.; [ɯ] = 0.105 s.

Note that the duration of a short vowel [ɯ] in a non-initial syllable (0.105 s.) is a little longer than its average duration in an initial syllable (0.075 s.), Cf. supra.

3. Vowel Harmony

Researchers interested in vowel harmony in the Mongolian languages (Mongolian languages) divide the vowels into two series differing by a type of distinctive trait. This trait differs according to the authors:

± anterior (Vladimirtsov, 1988 [1929]), ± open (Hattori, 1975), ± "strong" (Tömörtogoo, 2017 [2002]), ±ATR (Čenggeltei, 1959, Djamouri, 1984)

According to our analysis of the Baochang khorchin dialect, the vowel harmony in this dialect is based on the trait ±ATR, that is, on the position of the root of the tongue (advanced +ATR or retracted - ATR), and therefore oppose the following two sets of vowels:

+ ATR	- ATR
/ɯ/ /i/ /u/	/ɑ/ /ɛ/ /ʊ/ /ɔ/ /œ/

1) Within a root, non-initial vowels are always of the same series as the initial vowel, so we will talk about root +ATR or root - ATR.

Notes:

1) The respective frequencies of the vowels are very different.

Non frequent vowels: ɛ, œ

+ATR vowels: i rare in 2nd syllable; i followed by i very rare

- ATR vowels: no mixing between rounded + rounded vowels in a single root

— -arrondies: a and ʊ frequent, ɛ rare
— no co-occurrence of a and ɛ in the same root. Exception: /ɛlbɑ/ "all"
— examples of ɛ followed by ʊ: very rare

		1st syllable	2nd syllable	Example	Translation
Root		ɯ	ɯ i u	/tɯmɯ/ /tɯli/ /xɯrul/	"Camel" "belt" "dispute"
+ATR		i	ɯ i u	/inɯ-/ /ʤili-/ /ilu/	"to laugh" "disappear" "more"
		u	ɯ i u	/unɯ/ /duli/ /xuʤu/	"cow" "deaf" "neck"
Root	Root	ɑ	ɑ ɛ ʊ	/ɑrɑ/ X /ɑdʊ/	"molar" "horse"
	- arrondi	ɛ	ɑ ɛ ʊ	/ɛlbɑ/* /dɛlɛ/ /ɛdʒgʊr/	"all, all" "sea" "root"
- ATR		ʊ	ɑ ɛ ʊ	/ʊdɑn/ /ʊgɛ/* /ʊdʒʊ/	"slow" "no" "large"
	Root + arrondi	ɔ	ɔ	/ɔdɔ/	"now"
		œ	œ	/œrœ/	"evening, night"

Note: these rules of appearance of vowels do not apply to borrowed words (mainly Chinese). Example: /bɑnšɯ/, from Chinese *ban*[1] *che*[1] "bus" (/ɑ/ -ATR followed by /ɯ/ +ATR)

2) Addition of suffixes

Khorchin is an agglutinating language. The nature +ATR or -ATR of the root determines the nature of the vowels of the suffixes.

Two types of suffixes: invariable and variable

3.1. Invariable Suffixes

They have only one form whatever the root they join. They are very few.

Examples:

— /-sgɯ/ semelfactive VBLZ (deverbative, aspect) indicating the immediacy of the action

/udʒ-/ "watch, see"	+ /-sgɯ/	→ [u · dʒə̆s · ˈgɯ]
/tat-/ "to pull"	+ /-sgɯ/	→ [tʰă̆tʰs · ˈgɯ]
/bɔd-/ "to think"	+ /-sgɯ/	→ [bɔ̆d̥s · ˈgɯ]

— /-dʒgɑ/ plurality VBLZ (deverbative, voice) indicating the plurality of actants

/ir-/ "to come"	+ /- dʒgɑ/	→ [ĭrdʒ · ˈgɑ]
/jɛb-/ "to go"	+ /- dʒgɑ/	→ [jĕbdʒ · ˈgɑ]

— /-tɛ/ COM (comitative case)

/gɯr/ "house"	+ /-tɛ/	→ [gŭr · ˈtɛ]
/gɑr/ "main"	+ /-tɛ/	→ [gă̆r · ˈtɛ]
/œrœ/ "night"	+ /-tɛ/	→ [œ̆ · rœ · ˈtɛ]

3.2. Variable suffixes

There are two subtypes: two allomorphs and three allomorphs

Suffixes with two allomorphs (archiphoneme noted /U/)

+ATR: the vowel will be [u]
- ATR: the vowel will be [ʊ]

Examples

— /-šUd/ PL (plural or collective suffix applying to human beings)

/bux/ "wrestler"	+ /-šUd/	→ [bŭx · ˈʃud̥] "wrestlers"
/duli/ "deaf"	+ /-šUd/	→ [dŭ · li · ˈʃud̥] "the deaf"
/bɑgɑ/ "small"	+ /-šUd/	→ [bɑgɑ · ˈʃʊd̥] "children"
/mɔŋl/ "mongol"	+ /-šUd/	→ [mɔŋl · ˈʃʊd̥] ~ [mɔŋ · ə̆l · ˈʃʊd̥] "the Mongols"

— /-Ul/ CAUS (verbal suffix)

/ir-/ "come"	+ /-Ul/	→ [ĭ · ˈrul] "let/make come"
/jɛb-/ "go"	+ /-Ul/	→ [jĕ · ˈbʊl] "send"
/bɔd-/ "think"	+ /-Ul/	→ [bɔ̆ · ˈdʊl] "let/make think"
/xœl-/ "mix"	+ / -Ul /	→ [xœ̆ · ˈlʊl] "let/make mix"

Suffixes with three allomorphs (archiphoneme noted /Ш/)

+ATR: the vowel will be [ɯ]
- ATR: the vowel will be [ɑ] in context -rounded
[ɔ] in context +rounded

Examples

— /-Шs/ ABL (ablative case)

/gɯr/ "house"	+ /-Шs/	→ [gŭ · ˈrɯs]
/gɑr/ "hand"	+ /-Шs/	→ [gă̆ · ˈrɑs]
/ɔr/ "bed"	+ /-Шs/	→ [ɔ̆ · ˈrɔs]

— /-nШ/ PRES (grammatical verbal suffix)

/udʒ-/ "look"	+ /-nШ/	→ [ŭdʒ · ˈnɯ]
/tɑt-/ "shoot"	+ /-nШ/	→ [tʰătʰ · ˈnɑ]
/bɔd-/ "reflect"	+ /-nШ/	→ [bŏd · ˈnɔ]

— /-Шn/ RFL (grammatical nominal suffix)

/ur/ "offspring"	+ /-Шn/	→ [ŭ · ˈrɯn]
/ɛlšʊr/ "tea towel"	+ /-Шn/	→ [ĕl · ʃʊ · ˈrɑn]
/xɔɔl/ "meal"	+ /-Шn/	→ [xɔː · ˈlɔn]

3.3. Suffix combination

— If all the suffixes are suffixes with allomorphs, the nature +ATR or -ATR of the root determines the choice of the allomorph.

— Root +ATR: the allomorph will be [u] for the archiphoneme /U/ suffixes and will be [ɯ] for the archiphoneme /Ш/ suffixes, regardless of the order of appearance of the suffixes.

Examples:

/buu/ "shaman" + /-šUd/ PL + /-Шn/ RFL → [buː · ʃu · dɯn] "his own group of shamans"

/id-/ "eat" + /-Ul/ CAUS + /-sn/ PAST. VN + /-Шs/ ABL + /-Шn/ RFL → [ĭ · duls · nɯ · sɯn] "[a part] of what we ourselves made him eat"

— Root -ATR: two cases occur depending on whether the vowels of the root are rounded or not.

• -rounded: the allomorph will be [ʊ] for the archiphoneme /U/ suffixes and will be [ɑ] for the archiphoneme /Ш/ suffixes, regardless of the order of appearance of the suffixes.

Examples:

/ɛlšʊr/ "tea towel" + /-Ud/ PL + /-Шr/ INST → [ĕl · ʃʊ · rʊ · dɑr] «by means of tea towels»

/ɑs-/ "burn out" + /-Ш/ CAUS + /-sn/ PAST. VN + /-Ud/ PL + /-Шs/ ABL → [ă · sɑs · nʊ · dɑs] "[a part] of what we burned "

•+rounded: the allomorph will be [ʊ] for the archiphoneme /U/ suffixes. For the archiphoneme suffixes /Ш/, it will be [ɔ] as long as no suffix with archiphoneme /U/ appears and [ɑ] at least one suffix with archiphoneme /U/ has appeared.

Examples:

/tɔɔ/ "number" + /-šШ/ NOMLZ + /-l/ V + /-sn/ PAST. VN + /-Ud/ nominal PL + /-Шs/ ABL → [tʰɔː · ʃɔls · nʊ · dɑs] "[some] of the things we counted"

— If there is an invariable suffix among the suffixes, the nature of the suffixes that follow will depend on the nature of the vowel of this invariable suffix and not on the nature of the root:

— Vowel of the invariable suffix other than /i/:

• vowel +ATR: /ɯ/ and /u/. The vowel of the following suffixes will be +ATR, i.e. [ɯ] for /Ш/ and [u] for /U/.

Examples:

/sɯr-/ + /-Ш/ CAUS + /-sgɯ/ semelfactive VBLZ + /-lШ/ IMM. PAST. IND → [sŭ · rɯs · gɯ · lɯ] "awake him lightly"

/ɑs-/ + /-Ш/ CAUS + /-sgɯ/ semelfactive VBLZ + /-Ul/ CAUS + /-lШ/ → [ă · sɑs · gɯ · gul · lɯ] "[we] just gave the order to set [it] on fire IMM. PAST. IND → [bŏs · gɔs · gɯ · lɯ] "we just put [it] upright rapidly"

• vowel -ATR: /ɑ/ and /ɛ/. The vowel of the following suffixes will be -ATR, i.e. [ɑ] for /Ш/ and [ʊ] for /U/.

Examples:

/sɯr-/ + /-Ш/ CAUS + /-ʤgɑ/ PLR+ /-lШ/ IMM. PAST. IND → [sŭɪ · rɯʤ · gɑ · lɑ] "[I] just woke them up"

/ɑs-/ + /-Ш/ CAUS + /-ʤgɑ/ PLR + /-lШ/ IMM. PAST. IND → [ă · sɑʤ · gɑ · lɑ] "[I] just woke them up"/bɔs-/ + /-gШ/ CAUS + /-ʤgɑ/ PLR + /-lШ/ IMM. PAST. IND → [bŏs · gɔʤ · gɑ · lɑ] "[I] just put them upright"

— Vowel of the invariable suffix /i/. The vowel of the following suffixes will not be +ATR but will depend on the nature of the root.

Example:

/mœr/ "horse" + /-Ud/ PL + /-ig/ ACC + /-Шn/ RFL → [mœ̆ · rʊ · di ·gɑn]

As a conclusion: discussion of the vowels /ɛ/ and /œ/

A comparative study of Khorchin with other Mongol dialects in China may clarify the status of the Khorchin vowels /ɛ/ and /œ/.

Vowel /ɛ/

According to Inner Mongolian linguists, notably Čoizingzab (1982) and Norzin (1998) for Chakhar, and Bayančoγtu (2002) for Khorchin, /ɛ/ does not exist in dialects other than Khorchin. However, there exist in these dialects vowels that are quite close in their phonetic realization (/æ/ for Oirat and Chakhar, /a/ for Ordos and Barga-Buryat), which come from the vowel noted *a* in Uyghur-Mongolian.

We propose to compare the Khorchin vowel /ɛ/ with its equivalents in these other dialects.

1) Take for example the term "life", written *ami* in Uyghur-Mongolian:

Khorchin:	/ɛm/ [ɛm]
Oirat:	/æm/ [æm]
Chakhar:	/æm/ [æm][9]
Ordos:	/ami/ [ami][10]
Barga-Buryat:	/amʲ/ [amʲ]

[9] Bürintegüs, 2005, p.14

[10] Mostaert, 2009 [1941], p. 20.

or the verb "to blink" in the imperative mood 2p. sg., written *ani* in Uyghur-Mongolian:

Khorchin: /ɛn/ [ɛn]
Oirat: /æn/ [æn]
Chakhar: /æni/ [æni][11]
Ordos: /ani/ [anī][12]
Barga-Buryat: /anʲ/ [anʲ]

The table below highlights the following possible evolution:

Uyghur-Mongolian script	Ordos	Barga-Buryat	Chakhar	Oirat	Khorchin
ami	[ami]	[amʲ]	[æm]	[æm]	[ɛm]
ani	[ani]	[anʲ]	[æni]	[æn]	[ɛn]

An interpretation could be that the sound [ɛ] is not a phoneme in Khorchin either. [ɛ] would simply be the "anteriorized" realization of /ɑ/ in Khorchin (corresponding to the initial *a* of the word in Uyghur-Mongolian writing) under the effect of the non-initial *i*. We would be dealing with a case of regressive assimilation. Examples in Khorchin:

bariqu [bɛ · rə̆χ] ~ [bʲɛ · rə̆χ] "to take (HYP. VN)"
garudi [gɛrd̥] ~ [gʲɛrd̥] "phoenix" (borrowed from Sanskrit *garuda*)
cabciqu [ʃɛb · ʃĭχ] "to slaughter (HYP. VN)"

Thus, the phonological form underlying [bɛ · rə̆χ] ~ [bʲɛ · rə̆χ] would be /bari-x/ and not /bɛr-x/. In the phonetic realization, there is a fall of /i/ – with possible palatalization of /b/ –and appearance of an epenthetic vowel: [ə̆][13]. This is a case of regressive assimilation, analogous to what has occurred for Chakhar and Oirat according to the above-mentioned researchers.

Note:

The table above traces the evolution that took place in the different dialects. Ordos seems the most conservative, preserving in particular the disyllabic form. In Barga-Buryat, the *i* has fallen with palatalization of the consonant that preceded it. In Chakhar, Oirat and Khorchin, the term has only one syllable, with anterior realization of *a* ([æ], [ɛ]) without palatalization of the consonant for Chakhar and Oirat, with possible palatalization in Khorchin. Note that regressive assimilation has caused a decrease in the number of syllables.

2) There are other cases of regressive assimilation in Khorchin, for example when adding a suffix. So:

/ʤɑr-/ "use" + /-š/ AGENT → [ʤɛrʃ] "servant"

Here, the vowel /ɑ/ is anteriorized [ɛ] under the influence of the palatal fricative consonant /š/.

[11] Bürintegüs, 2005, p. 2.
[12] Mostaert, 2009 [1941], p. 23.
[13] The phonological form /bari-x/ with /i/ makes it possible to explain that one can have [bɛ·ˈrə̆χ] or [bʲɛ·ˈrə̆χ] as phonetic realizations.

This example shows that the vowel /i/ is not the only phoneme to have influence on the vowel /ɑ/.

3) Other arguments reinforce our point of view questioning the phonological status of /ɛ/ in Khorchin.

— Thus, a comparison between Mongolian dialects shows that there is in Khorchin a "contamination" by the palatal fricative consonant /š/ within the same syllable. Example for the term *sir-a* "yellow":

Uyghur-Mongolian script	Ordos	Barga-Buryat	Chakhar	Oirat	Khorchin
sir-a	/šar/	/šar/	/šar/	/šar/	[ʃɛr]

This time we are dealing with a progressive assimilation. The phonological Khorchin form would be /šɑr/.

— Let's take another example with the term jabu "walk!":

Uyghur-Mongolian script	Ordos	Barga-Buryat	Chakhar	Oirat	Khorchin
jabu	/jabu/[1]	/jaw/	/jab(ah)/[2]	/job/	[jɛb]

It is still a progressive assimilation, this time due to the palatal approximant /j/. The phonological Khorchin form would be /jɑb/.

In conclusion, we question the existence of a phonological vowel /ɛ/ in Khorchin.

Vowel /œ/

The phonological status of this vowel seems to us as debatable as that of /ɛ/.

In our opinion, /œ/ would not have any phonological existence and the sound [œ] would be only the phonetic realization of /ɔ/ by assimilation.

1) Let us examine the evolution according to the different dialects of the terms *toli* "mirror" and *oroi* "evening, night ":

Uyghur-Mongolian script	Ordos	Barga-Buryat	Chakhar	Oirat	Khorchin
toli	[t‘oli][3]	[tɔlʲ]	[tœl] [4]	[tolʲ]	[tʰœl] ~ [tʰʲɛl][5]
oroi	[orɔ̃][6]	[ɒrɒi]	[ɔrɔi][7]	[ora]	[ɶ̆·ˈrœ] ~ [ɛ̆·ˈrɛ]

We propose that in Khorchin the underlying phonological form is /tɔli/ for "mirror" and /ɔrɔi/ for "evening; night". The observed realizations would again be examples of regressive assimilation with a more or less strong anticipation of /ɔ/ in [œ] or [ɛ] and, in the first example, possible palatalization of the consonant preceding the vowel, as well as a decrease in the number of syllables.

2) Note that, contrary to what happens for /ɑ/, the vowel /ɔ/ does not undergo progressive assimilation in the presence of the palatal fricative consonant /š/ or palatal approximant /j/. Example with "custom", noted *josu* in Uyghur-Mongolian:

Uyghur-Mongolian script	Ordos	Barga-Buryat	Chakhar	Oirat	Khorchin
josu	/jos/	/jos/	/jos/	/jos/	/jɔs/ [jɔs]

General remark:

If our above assumption that ɛ and œ are not phonological in Khorchin is valid, then it would be necessary to reconsider the existence in Khorchin of the phonological diphthongs /ɔi/ or /ɑi/. This will be the subject of a further research.

Bibliography

Bayančoɣtu, *Qorčin aman ajalɣun-u sudulul* [Study of the Khorchin dialect], Hohhot: Öbür mongɣul-un ardin-un keblel-ün qoriy-a, 2002.

Bürintegüs, *Mongɣul kelen-ü zöb daɣudalɣ=a zöb bičilge-in toli* [Dictionary of spelling and pronunciation of Mongolian], Hohhot: Öbür mongɣul-un suryan qümüzil-ün keblel-ün qoriy=a, 2005.

Chaganhada, 蒙古语科尔沁土语研究 *meng² gu³ yu³ ke¹ er³ qin⁴ tu³ yu³ yan² jiu¹* [The study of the Khorchin dialect of the Mongolian language], Beijing: shehui kexue wenxian chubanshe, 1996.

Mostaert A., *Dictionnaire ordos*, Hohhot, (Reissue) Öber mongɣol-un arad-un keblel-ün qorij-a, 2009 [1st edition: Peking, 1941].

Rialland A., Redouane D., "Harmonie vocalique, consonantique et structure de dépendance le mot en mongol khalkha" in *Bulletin de la Société de Linguistique de Paris,* N° 79, 1984, pp. 333-383.

Sečinbaɣatur (dir.), *Mongɣul kelen-ü nutuɣ-un ajalɣun-u sinzilel-ün uduridqal* [Introduction to dialectology of the Mongolian language], Hohhot: Öbür mongɣul-un arad-un keblel-ün qorij=a, 2005.

Svantesson J-O., Tsendina A., Karlsson A., et al., *The Phonology of Mongolian*, Oxford, New York: OXFORD University Press, 2005.

Tömörtogoo, D., "Orchin tsagiin mongol khelnüüd, tedgeeriin garal, khögjil", in *Mongol khel shinjleliin onol, tüükhiin asuudaluud*, Ulaanbaatar: MUIS, 2002, p. 35-62.

Vladimirtsov B. YA., *Mongɣul bičig-ün kele ba qalq=a aman ajalɣu-ji qaričaɣuluɣsan kele züi*, [Grammar of the written Mongolian language and the Khalkha dialect], Xining: Kökenaɣur-un arad-un keblel-ün qorij=a, 1988.

YANG Guoqing, "Zhongguo mengguzu renkou qianyi fenxi" [Analysis of the migration of the Mongolian population of China], in: *Zhongguo Tongji*, 7, 2013.