

# The Phonology of Mongolian

Jan-Olof Svantesson,  
Anna Tsendina,  
Anastasia Karlsson,  
and Vivan Franzén

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# ABBREVIATIONS AND SYMBOLS

## *Languages and dialects*

AM	Arabic Mongolian
Baa	Baarin Mongolian
Bon	Bonan
Bur	Buriad
Ch	Chinese
Cha	Chahar Mongolian
Dag	Dagur
Hlh	Halh Mongolian
KJ	Kangjia
Klm	Kalmuck
Kmn	Kamnigan
Mgr	Monguor
Mo	Mongolian
Mog	Moghol
Oir	Oirad
OM	Old Mongolian
Ph	'Phags-pa Mongolian
Ru	Russian
San	Santa
ShY	Shira Yugur
SM	Sino-Mongolian
Tib	Tibetan
UM	Uigur Mongolian
WM	(Modern) Written Mongolian
YCh	Yuan dynasty Chinese

## *Grammatical forms (Halh and/or Old Mongolian forms of the suffixes are given)*

ABL	ablative ( <i>-Es</i> ; * <i>-AčʰA</i> )
ACC	accusative ( <i>-(i)g</i> ; * <i>-i</i> )
AGNR	agent nominalizer ( <i>-čʰ</i> )
AR	adjectivizer (various suffixes)
CAUS	causative ( <i>-Uč</i> ; * <i>-kA</i> )
COLL	collective ( <i>-čʰGE</i> , <i>-Uč</i> )
COM	comitative ( <i>-tʰEi</i> )
COND	conditional ( <i>-pč</i> ; * <i>-pAsU</i> )
COOP	cooperative ( <i>-čʰc</i> )

CV	converb ( $-y$ ; $*-n$ )
DAT	dative ( $-t$ ; $*-A$ )
DER	derivational suffix
DPST	direct past ( $-\xi E$ )
FUTP	future participle ( $(\partial)x$ ; $*-k^hU$ , $*-k^hUn$ , $*-k^hUi$ )
GEN	genitive ( $-in$ ; $*-Un$ , $*-U$ )
IMP	imperative ( $-g$ ; $*-t^hUk^hAi$ )
INST	instrumental ( $-Er$ ; $*-ijAr$ ; $*-pAr$ )
IPFG	imperfect gerund ( $-\check{c}$ ; $*-\check{c}U$ )
NPST	nonpast ( $-n$ )
NR	nominalizer (various suffixes)
PFG	perfect gerund ( $-Et$ )
PL	plural ( $-\check{c}^hUt$ , $-t$ ; $*-Ut$ , $*-s$ , $*-t$ )
PST	past ( $-w$ ; $*-pA(i)$ )
PSTP	past participle ( $-sy$ ; $*-ksAn$ )
Q	question ( <i>wee</i> , <i>pee</i> , $-(j)U$ )
RFL	reflexive ( $-E$ ; $*-ijAn$ , $*-pAn$ )
TERM	terminal ( $-t^h\xi$ )
VR	verbalizer (various suffixes)

### Other abbreviations

A	$*a/*e$ (10.6.2)
[ATR]	[advanced tongue root] (5.1)
C	consonant (5.1)
E	<i>e/a/o/ɔ</i> (5.2)
[F]	[pharyngeal] (5.1)
G	<i>g/G</i> (5.2.6)
H	high tone (Chapter 7)
L	low tone (Chapter 7)
O	$*o/*\emptyset$ (10.6.2)
[O]	[open] (5.1)
[P]	[palatal] (5.1)
[R]	[round] (5.1)
[RTR]	[retracted tongue root]
U	<i>u/ʊ</i> or $*u/*y$ (5.2; 10.6.2)
V	vowel (5.1)
[V]	[velar] (5.1)

### Symbols

- syllable boundary
- graphic boundary in Written Mongolian (4.3; 8.1)
- morpheme boundary
- morpheme and graphic boundary (8.1)

=	boundary between phonological words in compounds
[	initial boundary tone (7.3)
]	final boundary tone (7.3)
/ . . /	phonological representation
[ . . ]	phonetic form
< . . >	transliteration
/n	unstable <i>n</i> (10.9.1)

# TRANSCRIPTION

Halh (Khalkha) Mongolian forms are usually given in a quasi-phonemic transcription where epenthetic vowels and vowel harmony alternants are shown, for example, *mɔŋgɔččʰut* монголчууд ‘Mongols’. The Cyrillic Mongolian spelling is also shown. Phonological representations are given within slashes, /mɔŋgɔččʰut/, and when phonetic details are discussed, a narrower phonetic transcription in square brackets, like [mɔŋgɔččʰut], may be given.

IPA symbols are used with the exception that affricates are written with single symbols: *c, č, ġ, j* = [ts, tʃ, dʒ]; and further, *š, ž* = [ʃ, ʒ]. Although the letters [a] and [d] denote different sounds in the IPA alphabet, this vowel quality difference is not used in any Mongolic language, and we use *a* as the italic form of the letter a, with no sound difference intended.

Words from other Mongolic dialects and languages are taken from published sources. For ease of comparison the phonetic symbols have been normalized to fit in with our transcription of Halh (see Chapter 9 for details). Words from the different written sources for Old Mongolian are given in a strict transliteration of the respective writing system (see Chapter 8).

In the bibliography, and in proper names mentioned in the text, conventional transcriptions are used. The Cyrillic alphabets for Russian, Mongolian, Kalmuck, and Buriad are transliterated as in Table 4.1. The obsolete Russian letters Ѳ and ѵ are transliterated ē and ī. The transcription systems used for Chinese, Japanese, and Korean are *pinyin*, Hepburn, and McCune-Reischauer. For Written Mongolian, the Mostaert transcription is used with some modifications (see Table 4.2, p. 41).

For writing Mongolian, Chinese, Japanese, Korean, and Russian personal names with the Latin alphabet, we have used the transcriptions for these languages used elsewhere in the bibliography, although these are not always the forms preferred by the authors. We apologize for any inconvenience caused by this. We use the order: family name–personal name, for all Chinese, Japanese, and Korean names even in running text.

# INTRODUCTION\*

In this book the phonology of Mongolian is presented from two points of view, synchronic and diachronic. In Chapters 1–7, basic instrumental phonetic data on Standard Mongolian, the Halh (Khalkha) dialect as spoken in Ulaanbaatar, the capital of the Republic of Mongolia, is presented, and the phonology is analysed. The first two chapters give acoustic data on vowels and consonants, respectively. In Chapter 3, a phoneme analysis is given, and in Chapter 4, the two writing systems used for Mongolian are presented and related to the phoneme analysis. In Chapter 5, (morpho)phonological processes are presented, in particular vowel harmony, which is unusually regular in Mongolian. In Chapter 6, syllable structure and syllabification is treated together with epenthesis of schwa vowels, which is shown to depend on syllabification. Finally, intonation and stress is treated in Chapter 7, again based on acoustic measurements. In this part of the book, the term Mongolian normally refers to Ulaanbaatar Halh Mongolian.

Halh is a dialect of the Mongolian language, which forms the Mongolic language group (or language family) together with ten rather closely related languages. From Chapters 8–10, we give an overview of the Mongolic languages and their historical development. In Chapter 8, we reconstruct Old Mongolian, the immediate ancestor of the languages of the oldest Mongolian written sources. In Chapter 9, we give short sketches of the eleven modern Mongolic languages, and in the final chapter we describe the phonological processes that shaped the modern languages from Old Mongolian. In this way we try to give a unified description of the main phonological features of the modern languages, using a historical point of view, without going into the details of each language. We believe that this approach, which is the traditional one in Mongolian studies, adds insights, and gives a background, to the strictly synchronic analysis in previous chapters. Many synchronic phonological phenomena in Halh Mongolian, for example, pharyngeal vowel harmony and its relation to the distribution of palatalized consonants, can be understood better if the historical background is kept in mind. Furthermore, the Mongolic languages are close enough to make a simultaneous diachronic description of them meaningful. We focus on the phonological processes that shaped the languages from their common ancestor rather than on separate developments in

\* Several dictionaries were useful for finding examples, in particular the Mongolian–English dictionary by Bawden (1997), the two Mongolian–Chinese dictionaries *Mongol Kitad toli* (1999) and *Xin Meng–Han cidian* (1999), and the Academic Mongolian–Russian dictionary (Bajarsajhan et al. 2001–2). For some purposes, the reverse alphabetic dictionary by Vietze and Zenker (1976) was very valuable. The official orthographic and morphological dictionary by Damdinsüren and Osor (1983) was used as a norm for the Cyrillic spelling. All examples taken from dictionaries were checked by Tsendina, and in doubtful cases other native speakers of Ulaanbaatar Halh were consulted as well.

the individual languages. These processes, described in Chapter 10, taken together with the description of Old Mongolian in Chapter 8 give a rather detailed picture of the phonologies of the different modern Mongolic languages, with the detailed synchronic description of Halkha in the early part of the book as a kind of standard of comparison.

The Mongolic language group is usually regarded as one of the three branches of the Altaic language family. The others are the Turkic and Tungusic languages. Some scholars are convinced that Korean, Japanese, and even Ainu also belong to the Altaic family, while others are equally convinced that Altaic is not a valid genetic grouping, so that Mongolic, Tungusic, and Turkic are separate language families, whose structural and lexical similarities are due to areal influence. Authors who are in favour of the Altaic family include most Mongolists, John Ramstedt (1957) and Nicholas Poppe (1965) among others. The existence of Altaic as a valid genetic grouping is refuted by authors such as Gerard Clauson (1956) and Gerhard Doerfer (1966). There have also been some attempts to connect Mongolian with the Dravidian languages (see e.g. Vacek (1996)). However, the possible relations of Mongolic to other language groups will not be treated here.

The first scientific study of the phonology of a Mongolic language was the description of Halkha by the Finland-Swedish scholar, John Ramstedt, published in 1902. In accordance with the then current linguistic practice, he analysed Halkha phonology from an historical point of view, comparing it with Classical Written Mongolian. His work became highly influential, especially in Russia, and was the model for the phonological works of Boris Vladimircov, Nikolaj Poppe, and several others.

The first instrumental phonetic investigation of a Mongolic language was made in 1915–16 by the Helsinki phonetician, Jean Poirot, who measured Kalmuck segment durations. The results were not published until 1935, in Ramstedt's Kalmuck dictionary (pp. xxi–xxvi). The Japanese Obata Jûichi and Teshima Takehiko (1934; 1935) measured formant frequencies for Mongolian vowels and the duration of some consonants. More substantial investigations were not made until the 1950s in China and the Soviet Union. Ignatij Buraev and Valentin Zolhoev in Buriatia, Dordži Pavlov and Petr Bitkeev in Kalmuckia, as well as Sürengijn Möömöö in Mongolia made pioneering phonetic work on their respective languages. Younger researchers, such as Tamara Esenova in Kalmuckia, have continued, but unfortunately the economic situation in Russia and Mongolia has now almost put an end to instrumental phonetic work in these countries. The most dynamic and interesting work on Mongolian phonetics is no doubt being done by Mongol scholars in China. Instrumental phonetic investigations had already been made in the 1950s by Cenggeltei, Coyijongjab, and others, and they are now continued by scholars like Köke and Bayarmendü. Recently, natural language processing of Mongolic languages has been undertaken by the researchers Köke and Dawa, both from China, and by Ljubov' Radnaeva from Buriatia.

An impressive number of descriptions of dialects and of lesser-known Mongolic languages have been made in the countries where they are spoken. In addition to

those already mentioned, the Kalmuck scholar Buljaš Todaeva, Valentin Rassadin in Buriatia, and Žavzangijn Coloo in Mongolia made important contributions to this field. Again, this work is very strong in the Mongolic-speaking parts of China, where detailed descriptions of all indigenous Mongolic languages have been published by Böke, Engkebatu, Chen Naixiong, and several others. Phonological analyses of Hall Mongolian were made by Šadavyn Luvsanvandan in Mongolia.

Comparatively little phonetic and dialectological work has been done by researchers from outside the Mongolic-speaking countries, where the tradition has been more historical and philological. The dominating scholar has undoubtedly been Nikolaj Nikolaevič (Nicholas) Poppe, who was first working in the Soviet Union but emigrated to the United States in 1949. He published extensively in virtually all fields of Mongolian studies, in particular historical linguistics. Other scholars with a broad and varied production are the Japanese Nomura Masayoshi and Hattori Shirō. The Japanese tradition is continued by mongolists such as Jōo Hakutarō, Kuribayashi Hitoshi, and Saitō Yoshio.

Mongolic historical phonology in the tradition of Ramstedt, Vladimircov, and Poppe was revived recently by the increasing amount of data becoming available from the lesser-known Mongolic languages. The most important work is done in China and Mongolia by scholars as Jagunasutu, Kögjiltü, and Tömörbüge.

As this sketchy and subjective survey shows, the bulk of the research on Mongolic phonology is being done by scholars in the Mongolic-speaking countries, in spite of difficulties created by economic factors and changing political situations. Unfortunately, their research is often published in journals and books which, in addition to the language barriers, are difficult to access in libraries outside these countries. Although it has not been possible to describe all results and discussions in this literature, we feel that it deserves to be better known among Western

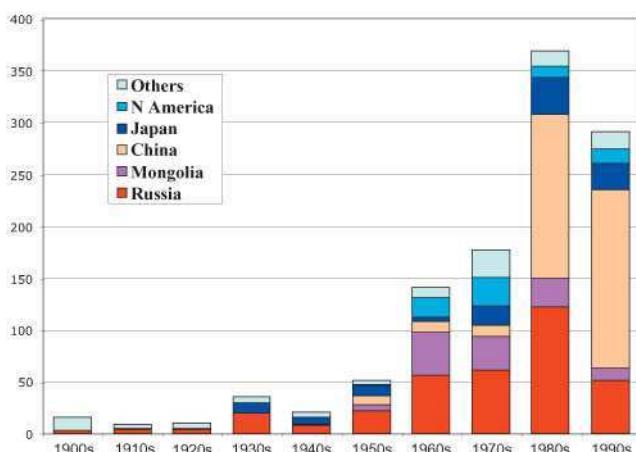


FIGURE 0. Research on Mongolian phonology

scholars than is now the case, and we have tried to cite the relevant publications in the proper places.

Although there are several specialized bibliographies on Mongolian studies, the most important bibliographical tool for Mongolian linguistics is the annual *Linguistic bibliography (Bibliographie linguistique)* (1939– ) which indexes most publications about Mongolian linguistics even from China and Mongolia. Recent issues can be accessed on the Internet, at <http://www.kb.nl/kb/blonline/>.

The state of Mongolian studies (or more precisely, Mongolian phonology) in different parts of the world is illustrated in Figure 0, where the number of publications appearing in the bibliography of this book (except works which do not deal specifically with Mongolian) are shown broken down by country of origin (of the main author) and year of publication. Several interesting observations can be made from this graph, in particular the decline of Russian (and Mongolian) science in the 1990s, and the emergence of China as the most important country for Mongolian studies in the 1980s and 1990s.

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## VOWELS

In this chapter we present briefly the results of our phonetic analyses of the Halh Mongolian vowels. The consonants are treated in the following chapter, and a phoneme analysis is given in Chapter 3.

The acoustic phonetic investigation of Halh in Chapters 1 and 2 is based mainly on recordings made by one of the authors (JOS) in Ulaanbaatar in May 1990, using a portable cassette recorder of relatively high quality (Sony WM D6C). The main recordings were made by three male speakers of Halh, Basbajar (BB), Davaadorž (DD), and Hürelbaatar (HB). They were born, and had grown up, in Ulaanbaatar, and were living there at the time of the recording. Their ages were twenty-one, twenty-six, and thirty-six years, respectively. A list of words and sentences illustrating various phonetic phenomena was recorded. Some of the words were read in isolation, and some in a focused position in a carrier sentence. Each word was read three to five times by each speaker. The recordings were analysed in the *ESPS/Waves+* environment on Sun workstations at the Department of Linguistics, Lund University, or using the *Praat* speech analysis program written by Paul Boersma and David Weenink (University of Amsterdam). Some of the figures were made with the *WaveSurfer* analysis program written by Kåre Sjölander and Jonas Beskow (Royal Institute of Technology (KTH), Stockholm).

### 1.1 ACOUSTIC PROPERTIES OF MONOPHTHONGS<sup>1</sup>

There are seven long vowels [i:, e:, a:, u:, ʊ:, o:, ɔ:] and six short vowels [i, a, u, ʊ, ɔ] in initial syllables (see below for the vowel transcribed [i]). In non-initial syllables, there are full vowels [i, ɪ, e, a, u, ʊ, o, ɔ] as well as phonetically reduced vowels which we will write as [ĩ, ē, ā, ū, ō, ŷ] in this chapter. In addition to the monophthongs, there are also diphthongs, to be treated in section 1.2.

A list of disyllabic words (1) illustrating each combination of monophthongic vowels in the first and second syllable was recorded by the three Ulaanbaatar speakers. The material does not contain palatalized or alveopalatal consonants which may affect the vowel quality. The words were read in the sentence frame [pi: gisəŋ] би \_\_\_ гэсэн 'I said \_\_'. Two recordings of each word from each speaker were analysed. The duration and the first three vowel formants were measured from spectrograms and waveform displays, using the *ESPS/Waves+* environment.

<sup>1</sup> For sources and notes on *Acoustic properties of monophthongs*, see App. B on p. 218.

(1) *Material for the acoustic investigation of monophthongs*

[ʃiʃig]	шилийг	'glass-ACC'	[pi:rig]	бийрийг	'brush-ACC'
[ʃiʃer]	шилээр	'glass-INST'	[pi:rer]	бийрээр	'brush-INST'
[piʃpur]	билбүүр	'hypocrite'	[ti:ʃuʃ]	дийлүүл	'to win-CAUS'
[čhiʃgir]	чилгэр	'sturdy'	[ti:ʃiʃh]	дийлэлт	'victory'
[tiʃig]	дэлийг	'mane-ACC'	[te:ʃig]	дээлийг	'robe-ACC'
[tiʃer]	дэлээр	'mane-INST'	[te:ʃer]	дээлээр	'robe-INST'
[tiʃgur]	дэлгүүр	'shop'	[te:gur]	дээгүүр	'over'
[tiʃgir]	дэлгэр	'wide'	[ce:ʃpər]	зээлбэр	'loan-word'
[taʃig]	далыг	'seventy- ACC'	[pa:ʃig]	баалыг	'lap-dog-ACC'
[taʃar]	далаар	'seventy- INST'	[pa:ʃar]	баалаар	'lap-dog- INST'
[taʃuʃ]	далуул	'seventy- COLL'	[ca:iʃuʃ]	зааруул	'to dislocate'
[carăʃ]	зарла	'to announce'	[sa:răʃ]	саарал	'grey'
[suʃtig]	сүлдийг	'emblem- ACC'	[su:ʃig]	сүүлийг	'tail-ACC'
[suʃter]	сүлдээр	'emblem- INST'	[su:ʃer]	сүүлээр	'tail-INST'
[puʃur]	бүлүүр	'paddle'	[tu:gur]	дүүгүүр	'sling'
[purtăʃ]	бүрдэл	'range'	[tu:ʃgür]	дүүлгэр	'frisky'
[suʃig]	сулыг	'loose-ACC'	[cu:riŋ]	зуурыг	'moment- ACC'
[suʃar]	сулаар	'loose-INST'	[cu:rar]	зуураар	'moment- INST'
[corguʃ]	зургуул	'six-COLL'	[cu:roʃ]	зууруул	'ink-slab'
[curōʃh]	зуралт	'pencil lead'	[tu:ʃoʃ]	дуулал	'singing'
[toʃig]	долийг	'flame-ACC'	[po:riŋ]	боөрийг	'kidney-ACC'
[torwulʃ]	дорвүүл	'four-COLL'	[co:ʃruʃ]	зөөлрүүл	'to soften'
[toʃor]	долоор	'flame-INST'	[poror]	боороор	'kidney-INST'
[soʃor]	сөлөр	'cross-eyed'	[co:ʃrōʃh]	зөөлрөлт	'softening'
[toʃig]	долыг	'experience- ACC'	[po:ʃig]	боолыг	'slave-ACC'
[tɔ:ʃuʃ]	долуул	'seven-COLL'	[tɔ:giŋ]	доогуур	'below'
[tɔ:ʃor]	долоор	'experience- INST'	[po:ʃor]	боолоор	'slave-INST'
[po:ʃør]	болор	'crystal'	[pɔ:tʃʃ]	боодол	'bundle'

The mean durations for each vowel are shown in (2). The results are summarized in Figure 1.1, and they are illustrated for speaker DD in Figure 1.2.

These measurements show that the duration of a short vowel in the initial syllable is almost exactly half (on average 48 per cent) of the duration of a long vowel. The duration of a full non-initial vowel is, on average, 61 per cent of the duration

## (2) Mean duration of monophthongs (ms)

*n* = number of measurements on which each mean value is based

Long initial vowels (*n* = 8)

	[ɪ:]	[e:]	[ə:]	[u:]	[ʊ:]	[o:]	[ɔ:]
BB	143	159	162	134	155	170	153
DD	122	121	142	113	127	130	139
HB	107	122	143	110	129	145	137

Short initial vowels (*n* = 8)

	[i]	[ɪ]	[ə]	[u]	[ʊ]	[o]	[ɔ]
BB	73	84	89	74	69	74	85
DD	50	63	82	55	59	60	78
HB	55	52	78	46	56	50	57

Non-initial vowels

	[i]	[ɪ]	[ə]	[a]	[u]	[ʊ]	[o]	[ɔ]	reduced
<i>n</i>	16	12	12	8	16	12	4	4	28
BB	92	79	104	101	109	103	90	79	53
DD	62	61	86	90	82	90	100	75	46
HB	64	56	88	86	93	75	66	83	40

of a long initial vowel, and reduced non-initial vowels have a duration which is 34 per cent of the duration of a long initial vowel. Although full vowels in non-initial syllables developed historically from long vowels (10.5), their duration in modern English is closer to the duration of a short vowel in the initial syllable than to the duration of a long vowel. This supports the analysis of full non-initial vowels as short in section 3.1.1. As seen in (2) and in Figure 1.2, the usual intrinsic duration relation obtains, so that open vowels have longer duration than closed vowels.

The first three formant frequencies of each vowel were measured at a point where the influence of the surrounding consonants was judged to be minimal, usually

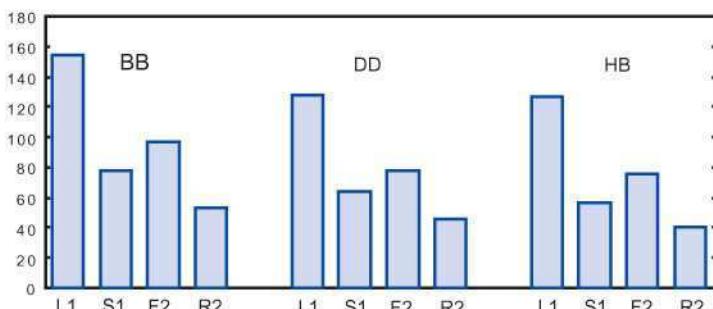


FIGURE 1.1 Mean vowel duration (ms) for the three speakers. L1 = long initial vowel, S1 = short initial vowel, F2 = full non-initial vowel, R2 = reduced non-initial vowel.

## VOWELS

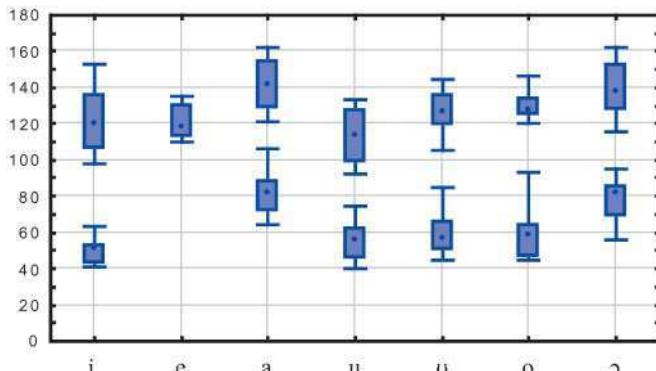


FIGURE 1.2 Duration of long and short initial vowels (Speaker DD). The boxes contain 50% of the values, with the point inside showing the median. The upper and lower marks show the maxima and minima.

close to the middle of the vowel. The formant tracking facility of *Waves* was used. The results are shown in Table 1.1.

The qualities of corresponding long and short initial vowels are approximately the same, but the short ones are usually slightly centralized, as illustrated in Figure 1.3. The only major exception is [ɔ], whose long and short versions have rather different qualities, although they function phonologically and historically as a long ~ short pair, and are written with the same Cyrillic letter (oe and ø). In a narrow phonetic transcription they could be written as [ɔ:] and [ø].

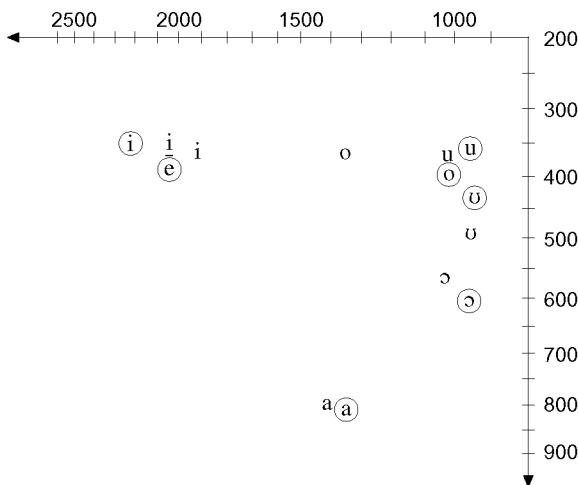


FIGURE 1.3 Mean formant frequencies (F1 and F2) for short initial vowels compared to long initial vowels (circled). Speaker DD.

TABLE 1.1 Formant frequencies for monophthongs (means of  $n$  measurements)(a) Long initial vowels ( $n = 8$ )

		[i:]	[e:]	[a:]	[u:]	[ʊ:]	[o:]	[ɔ:]
BB	F1	291	368	631	323	395	360	544
	F2	2,050	1,948	1,305	832	833	1,102	981
	F3	2,852	2,670	2,443	2,502	2,635	2,383	2,224
DD	F1	349	385	806	357	433	395	604
	F2	2,222	2,030	1,355	968	948	1,015	969
	F3	2,907	2,869	2,707	2,488	2,712	2,518	2,412
HB	F1	291	362	689	314	459	379	534
	F2	2,238	2,184	1,448	937	928	1,006	1,064
	F3	2,959	2,857	2,521	2,487	2,467	2,597	2,550

(b) Short initial vowels ( $n = 8$ )

		[i]	[ɪ]	[a]	[u]	[ʊ]	[o]	[ɔ]
BB	F1	341	336	586	340	415	359	517
	F2	1,929	1,970	1,290	1,062	974	1,367	1,004
	F3	2,727	2,660	2,428	2,519	2,678	2,363	2,134
DD	F1	363	358	792	370	489	366	565
	F2	1,919	2,047	1,410	1,032	956	1,350	1,032
	F3	2,844	2,862	2,596	2,578	2,712	2,407	2,424
HB	F1	348	340	688	333	444	343	540
	F2	2,061	2,161	1,509	1,195	1,073	1,603	1,095
	F3	2,848	2,867	2,667	2,620	2,525	2,543	2,569

## (c) Full non-initial vowels

		[i]	[ɪ]	[e]	[a]	[u]	[ʊ]	[o]	[ɔ]
	<i>n</i>	16	12	12	8	16	12	4	4
BB	F1	328	379	371	586	337	429	384	542
	F2	2,006	1,801	1,850	1,339	909	878	1,224	1,045
	F3	2,678	2,668	2,619	2,477	2,422	2,336	2,348	2,301
DD	F1	348	384	420	651	372	473	406	554
	F2	2,146	2,027	1,901	1,516	1,039	957	1,402	1,080
	F3	2,750	2,759	2,712	2,605	2,519	2,679	2,501	2,621
HB	F1	299	403	401	584	323	451	359	548
	F2	2,197	1,968	2,056	1,460	1,041	948	1,438	1,284
	F3	2,812	2,610	2,645	2,528	2,503	2,578	2,580	2,563

## (d) Reduced non-initial vowels

		[ɪ̄]	[ɛ̄]	[ā]	[ʊ̄]	[ɔ̄]	[ɔ̄̄]	[ɛ̄̄]
	<i>n</i>	6	2	4	4	4	4	4
BB	F1	356	376	538	353	402	351	485
	F2	1,708	1,493	1,413	1,667	1,051	1,451	1,131
	F3	2,409	2,430	2,397	2,434	2,632	2,453	2,797
DD	F1	390	397	637	364	472	380	510
	F2	1,932	1,703	1,547	1,732	1,088	1,455	1,171
	F3	2,701	2,692	2,708	2,627	2,793	2,541	2,611
HB	F1	355	318	529	334	493	427	503
	F2	2,012	1,674	1,386	1,733	1,149	1,490	1,204
	F3	2,536	2,428	2,508	2,516	2,453	2,559	2,477

Auditory analysis as well as the intuition of native speakers suggests that the short vowels written with the Cyrillic letters *и* <*i*> and *ө* <*e*> (usually the reflexes of Old Mongolian \**i* and \**e*) have merged to a vowel with the quality [i] in Ulaanbaatar Halkh. These vowels are distinguished in Table 1.1b and Figure 1.3 as [i] and [i]. The formants of these vowels are close to each other. The simultaneous equality of F1 and F2 was tested with Mahalanobis' D2-test (see e.g. Rao 1965: 480), with the result that the difference was not significant for speakers BB and HB ( $F(2, 13) = 1.34$  and  $2.70$ ;  $p > 0.05$ ). The difference was significant ( $F = 13.60$ ,  $p < 0.001$ ) for Speaker DD, however, but the reflex of \**e* has higher F2 and thus a more [i]-like quality than the reflex of \**i* for this speaker. Our conclusion is that these vowels have merged to [i] in Ulaanbaatar speech; according to Möömöö and Mönh-Amgalan (1984: 82), this merger took place in Central Halkh in general.

The qualities of non-initial full vowels are closer to the short initial vowels than to the long ones (see Table 1.1c and Figures 1.3 and 1.4). The quality of [o] is [ø]-like in this case as well. The two non-initial vowels [i] and [i] are phonetically different but do not contrast, since the quality depends on the vowel of the preceding syllable (see 1.1.2).

Reduced vowels occur only in non-initial syllables, and their quality depends on the preceding full vowel. In this chapter we will write the reduced vowels with the same symbol as the preceding full vowel with a breve added, e.g. [xurɔ̂ʃ] хурал ‘meeting’. As will be shown in Chapter 6, the reduced vowels are epenthetic (non-phonemic), and in our usual transcription we write them with the schwa symbol ə (so that the word ‘meeting’ is written *xurəʃ*). Although there is some individual variation, a reduced vowel is normally a centralized variant of the vowel of the preceding syllable (see Table 1.1d and Figure 1.5). The only major exception is [ü], which is more or less identical to [ɛ]. This is consistent with the Cyrillic Mongo-

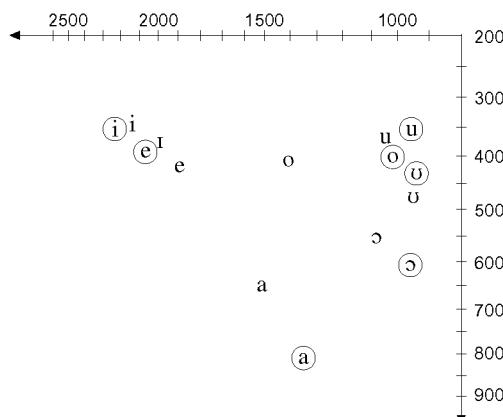


FIGURE 1.4 Mean formant frequencies (F1 and F2) for full non-initial vowels compared to long initial vowels (circled). Speaker DD.

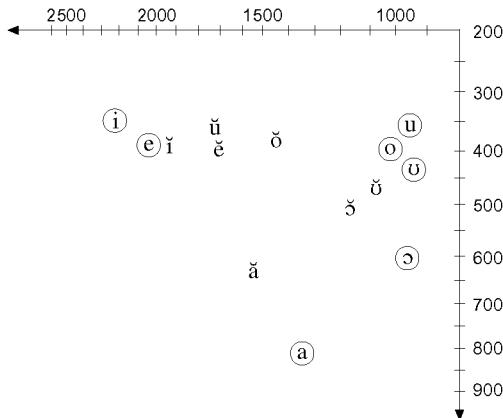


FIGURE 1.5 Mean formant frequencies (F1 and F2) for reduced non-initial vowels compared to long initial vowels (circled). Speaker DD.

lian script, which writes ɔ <è> in both cases (and also after [i], but [i] usually differs more from [ɛ] than [ü] does). On the other hand, the Cyrillic script implies that [ɔ] and [ă] are identical, both being written a <a>, but this is not confirmed by the acoustic data, which show that these two reduced vowels are quite different, being centralized forms of [ʊ] and [a], respectively. If the consonant immediately preceding the reduced vowel is an alveopalatal sibilant or a palatalized consonant, the reduced vowel is [i]-like (see 3.1.1).

### 1.1.1 The phonetic basis for vowel harmony<sup>2</sup>

Mongolian vowel harmony, whose phonological aspects are treated in section 5.2, divides the vowels into two classes [u, e, o] and [ʊ, a, ɔ]; the remaining vowel [i] is neutral. A non-compound word can contain vowels only from one of these classes. This causes the vowel pairs [u ~ ʊ], [e ~ a], and [o ~ ɔ] to alternate in suffixes. The phonetic characterization of the two vowel harmony classes is a bit controversial. Mongolian traditional grammar codified in works as *Jirüken-ü tolta-yin tayilburi* ‘Commentary to *Auricle of the heart*’ written by Danzandagba some time between 1727 and 1735, and *Kelen-ü cimeg* ‘Jewel of language’ written in 1828 by Agvangdandar (cf. Baldanžapov 1962a, b), divides the vowels into the harmony classes *em-e* ‘female’ and *er-e* ‘male’, and the neutral vowel *i* is called *ersü* ‘hermaphrodite’. In *Jirüken-ü tolta-yin tayilburi*, the terms *köndüi* (*köndei*) ‘hollow’, *cingga* ‘strong, tense’, and *sagarmag* ‘neutral’ are given as well.

The acoustic data (Table 1.1) show that the second member of each pair [u ~ ʊ], [o ~ ɔ], and [e ~ ə] has consistently higher F1 and normally lower F2 than the first

<sup>2</sup> For sources and notes on the phonetic basis for vowel harmony, see App. B on p. 219.

member. The same relation holds for [y ~ a], which is found in most non-Halh Mongolian dialects corresponding to Halh [e ~ a]; see Svantesson (1985). This is similar to the relation within the vowel harmony pairs in several West African languages, such as Akan, where X-ray investigations have shown that the articulatory cause of this acoustic effect is that the first member of a pair is pronounced with a wider pharynx than the second member (Lindau 1975; 1979). There is direct confirmation that this is the case in Mongolian in the X-ray pictures published by Cenggeltei and Sinedke (1959), which show that [u] and [o] have a wider pharynx cavity than [ʊ] and [ɔ], but are otherwise rather similar. Buraev (1959) (e.g. Figure 86, p. 110) and Buraev, Bažeeva, and Pavlova (1975) published X-ray pictures showing the same fact for Buriad [u] and [ʊ]. Möömöö (1977) reports (pp. 56–7) that his unpublished X-ray pictures show that [u] and [o] (his *ü* and *ɔ*) have a wider pharynx cavity than [ʊ] and [ɔ] (his *u* and *ɔ*). He further says that the tongue blade position is approximately the same for [u] and [ʊ], and for [o] and [ɔ], and that [u] and [ɔ] are characterized by having a greater tension in the tongue muscles than [ʊ] and [ɔ].

Following Svantesson (1985), we will assume a feature [pharyngeal] that denotes activity in the hyoglossi muscles which pull the tongue root backwards, possibly combined with activity in the pharyngeal constrictor muscles. The vowels [u, ɔ, a] have this feature, while [u, o, e] are non-pharyngeal (see further Chapter 5). The feature [pharyngeal] is more or less equivalent to [RTR] ‘retracted tongue root’; the opposite feature [ATR] ‘advanced tongue root’ has also been used for describing vowel harmony. Lindau (1979) used the feature [expanded] (approximately the same as [ATR]) for describing vowel harmony in West African languages.

### 1.1.2 *The vowel /i/*

The vowel phoneme /i/ is neutral to vowel harmony, in the sense that it can occur in non-initial syllables of words whose first syllable has a non-pharyngeal vowel

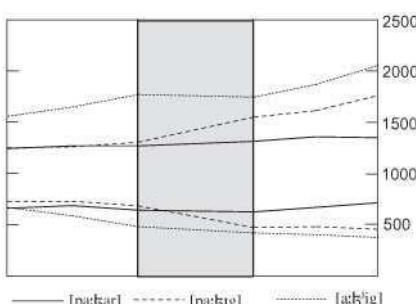


FIGURE 1.6 Stylized formant tracings of the words [pałčar] баалаар ‘lap-dog–INST’, [pałčig] баалыг ‘lap-dog–ACC’, and [aččig] аалый ‘manner–ACC’ based on three recordings of isolated words by Speaker BB. F1 and F2 were measured at the beginning, middle, and end of the vowels. The shaded area represents the intervocalic consonant.

[e, u, o] as well as in words with a pharyngeal vowel [a, ʊ, ɔ] in its initial syllable. The pronunciation is different in these two cases, however, and in detailed phonetic transcriptions we write [i] in non-pharyngeal words and [ɪ] in pharyngeal words. These two vowels are distinguished in Table 1.1c and Figure 1.4; the Cyrillic script writes them as ий and ы. The vowel [i] has higher F1 and lower F2 than [ɪ], the acoustic relation between them being the same as between the alternating vowel harmony pairs, so that [ɪ] is the pharyngealized version of [i]. Since they occur in disjoint environments, we regard them as allophones of one phoneme /i/. This variation takes place only in non-initial syllables, since /i/ does not occur in the initial syllables of pharyngeal words (5.2.1); see also Bayancogtu (1981b).

 Palatalized and plain (non-palatalized) consonants contrast (see 3.2.1), and the vowel phoneme /i/ occurs after both plain and palatalized consonants, for example after plain [ʒ] in [pa:ʒig] баалыг and after palatalized [ʒ̡] in [a:ʒ̡ig] аалыйг (see Figure 1.6). As indicated in the phonetic transcription, the quality of the vowel is different depending on the type of the preceding consonant: it is [i] after plain and [ɪ] after palatalized consonants. Although there is some coarticulation effect at the end of the preceding consonant, /i/ does not palatalize it. This can be seen by comparing F1 and F2 at the end of the first vowel [a:] in the word [pa:ʒar] баалаар with those in the word [pa:ʒ̡ig] баалыг (Figure 1.6). The formants do not differ significantly in these words; see also Svantesson (1991a).

## 1.2 DIPHTHONGS<sup>3</sup>

There are four diphthongs which will be written [ai, ɔi, ui, ui] here. They are illustrated in Figure 1.7, which shows the path of these diphthongs in the acoustic F1–F2 space for Speaker DD, based on recordings of the material in (3). The paths show F1 and F2 at the beginning and end of the diphthong and at three intermediate equidistant points. As this figure illustrates, the beginning and end of the paths are more or less central in relation to the target vowels. In the literature (e.g. Ramstedt 1902), Mongolian diphthongs are often written as ending in [e]. This is phonetically more correct than the notation we use, which reflects their historical origin and possibly the targets of the diphthongs. In fast speech, the paths of the diphthongs are even shorter.

### (3) Material for the acoustic investigation of diphthongs

	<i>habitual</i>	<i>perfect gerund</i>
‘to fight’	[taɪʒ̡təg]	дайлдаг
‘to fly up’	[sɔiʒ̡təg]	сойлдог
‘to put one’s hand in’	[suɪʒ̡təg]	сүйлдаг
‘to betroth’	[suɪʒ̡təg]	сүйлдэг
		[daiʃ̡laad]
		[sɔiʃ̡lood]
		[suɪʃ̡laad]
		[suɪʃ̡leed]

<sup>3</sup> Luvsanvandan (1956; 1980c); Radnaeva (1988); Coyijongjab (1989a).

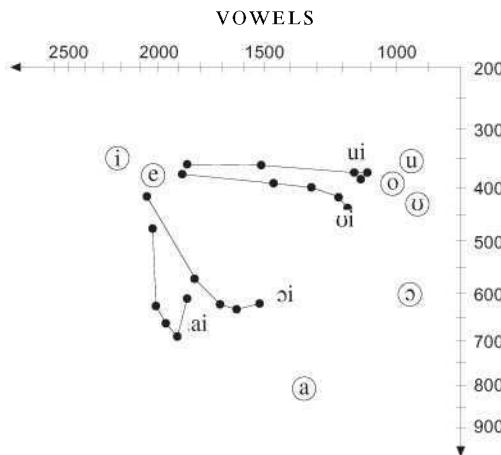


FIGURE 1.7 Diphthongs. Speaker DD. Each point represents the mean of four measurements. Long initial vowels are shown for comparison (circled).

### 1.3 PALATALIZED VOWELS

Consonant palatalization is contrastive in Mongolian, but the palatalized consonant phonemes are found only in words with pharyngeal vowels [a, u, ɔ]. When these vowels (long or short) are followed by a palatalized consonant, their pronunciation is changed so that the final part of the vowel becomes more [i]-like (cf. the word [a:lʒ:jɪg] in Figure 1.6). These palatalized variants are denoted [ä, ü, õ] in this section. Since they occur only before palatalized consonants, they must be regarded as allophones of the corresponding plain vowels. The non-pharyngeal vowels [e, u, o] never occur before palatalized consonants.

Kuribayashi (1985a) claims that the long palatalized vowels [ä:, õ:, ü:] and the *i*-diphthongs [ai, ɔi, ui] have merged in Halkh. In order to investigate this, we recorded the words in (4) read in isolation by the three Ulaanbaatar speakers. The frequencies of F1 and F2 were measured at the beginning and end of the vowel, and at three intermediate equidistant points.

#### (4) Long palatalized vowels and *i*-diphthongs

[älʒ:j]	аалъ ‘manner’	[aɪlʒ:j]	айл ‘encampment’
[ɔiʒ:j]	ооль ‘adze’	[ɔɪrʒ:j]	ойр ‘near’
[üiʒ:j]	ууль ‘owl’	[uɪlʒ:j]	уйл ‘to cry’

The results are reported in full in Svantesson (1991a), and are illustrated here in Figure 1.8. As this figure shows, the palatalized vowels are phonetically diphthongs, which have similar paths in the F1–F2 plane as the corresponding *i*-diphthongs, starting at a point in the neighbourhood of the corresponding non-umlauted vowel and ending in the [e ~ i] area. The path of the palatalized vowel is often longer, ending closer to [i] than the diphthong. There is also a difference in the timing structure of the path. Although the diphthongs and long palatalized vowels are acoustical-

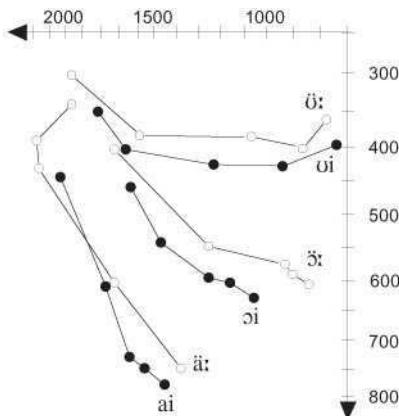


FIGURE 1.8 Long palatalized vowels vs. *i*-diphthongs. Speaker HB, based on five readings of isolated words.

ly similar, they are kept distinct in Ulaanbaatar Halkh, and the difference is usually quite salient perceptually. Other dialects of Mongolian, such as Chahar and Baarin, have merged these vowels, however, and this may have taken place in some Halkh areas as well.

Another interesting problem is the contrast between *i*-diphthongs and combinations of a vowel and the consonant [j], as in [pairar] байраар ‘building–INST’ vs. [pajrar] бајраар ‘happiness–INST’; see section 6.5 for a phonological treatment of this problem and for more examples. Both are phonetically realized as diphthongs, beginning with a vowel and ending in a palatal glide, which is not fricative-like. In this case as well, the difference between the two kinds of diphthongs depends mainly on the timing of the spectral changes from the initial to the final ([i]-like) part of the vowel. Figure 1.9 illustrates the contrasts for speaker DD; the two other speakers show a similar pattern. The combination [Vj] is more diphthongic, and its final part is a fairly constant [i] vowel, while [Vi] has smaller formant movements.

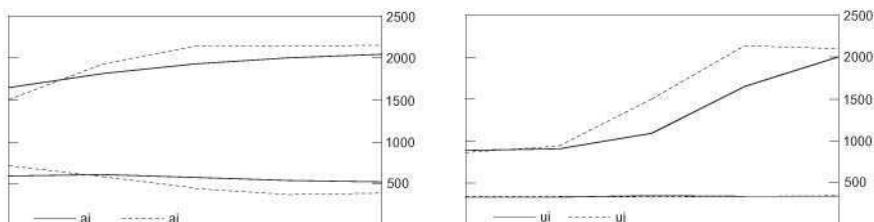


FIGURE 1.9 Stylized formant tracings of [Vi] diphthongs and [Vj] combinations based on two recordings of words said in isolation by Speaker DD. F1 and F2 were measured at the beginning and end, and at three intermediate equidistant points. The illustrated words are [pairar] байраар ‘building–INST’ vs. [pajrar] бајраар ‘happiness–INST’ (left) and [uiʒcɛx] үйлзэх ‘to whirl–FUTP’ vs. [ujʒcɛx] үелзэх ‘to fluctuate–FUTP’ (right).

## CONSONANTS<sup>1</sup>

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In this chapter we present briefly the results of our phonetic analyses of the Halh consonants, based on recordings of the same three Ulaanbaatar speakers as in Chapter 1. Some additional recordings were used for the illustrations.

### 2.1 STOPS AND AFFRICATES<sup>2</sup>

There are four places of articulation for stops in Mongolian: labial, dental, velar, and uvular. In addition, there are palatalized labial, dental, and velar stops, which contrast with the plain (non-palatalized) ones. There are also dental and alveopalatal affricates.

The velar, palatalized velar, and uvular stops, which have only one manner of articulation, are often voiced, unlike the other stops. Furthermore they function phonologically as voiced consonants (see 6.1.2). We will write them as [g, g<sup>j</sup>, g]. They may be fricativized, in particular the uvular stop which has the variant pronunciation [β].

For the other places of articulation, there are two contrasting manners. There is no consensus in the literature about their articulatory phonetic correlates. In his pioneering 1902 description of Halh Mongolian phonetics, John Ramstedt described the two series of stops and affricates as strong ~ weak (*fortis ~ lenis* or *stark ~ schwach*). According to Ramstedt, the strong series is voiceless, has post-aspiration in word-initial position, and has both pre- and postaspiration (*gehauchter eingang/ausgang*) in word-medial position. The weak series is usually voiceless, according to Ramstedt; other investigators describe them as ‘devoiced’. It is obvious both from listening and from our instrumental investigation that the ‘weak’ Halh stops are ordinary voiceless unaspirated stops, similar to those found in Russian or French, and similar to the prototypical sounds denoted by the IPA symbols for voiceless stops.

The phonetic nature of the ‘strong’ stops varies with their place in a word. Our acoustic data show that they are voiceless postaspirated in word-initial position and voiceless preaspirated in all other environments. We will use the term aspirated stop. Unlike Ramstedt we find postaspiration only in word-initial position. In

<sup>1</sup> Coarticulation is treated briefly by Köke (1999a).

<sup>2</sup> For sources and notes on stops and affricates, see App. C, p. 220.

his analysis, strong consonants never occur word-finally; our word-final aspirated stops and affricates are written with a following reduced vowel by him.

In previous phonemic transcriptions, the two series are almost universally rendered with symbols for voiceless and voiced consonants, and some investigators describe them as phonetically voiceless ~ voiced; see the survey of the literature in the Appendix on p. 220. The Cyrillic Mongolian script treats them in this way, using letters which denote voiceless and voiced consonants in Russian for the two series. Since our investigation shows that aspiration is the distinctive property, we will write the Halkh stops and affricates as voiceless aspirated ([p<sup>h</sup>], [t<sup>h</sup>], etc.) and voiceless unaspirated ([p], [t], etc.). Although the aspiration sign is written after the consonant, it is intended as a symbol for (pre- or post-) aspiration in general. The system of stops and affricates is then as shown in (1). We write the affricates as [c, č] (IPA [ts, tʃ]). See section 3.2 for a phoneme analysis.

(1) *Mongolian stops and affricates*

labial		dental		alveo-		velar	
plain	palat.	plain	palat.	palatal	plain	palat.	uvular
p <sup>h</sup>	p <sup>jh</sup>	t <sup>h</sup>	t <sup>jh</sup>				
p	p <sup>j</sup>	t	t <sup>j</sup>				
	c <sup>h</sup>			č <sup>h</sup>		g	g <sup>j</sup>
	c			č			g

We investigated the acoustic properties of Mongolian stops and affricates using recordings of the three Ulaanbaatar speakers BB, DD, and HB. A full report is given in Karlsson and Svantesson (2002), and the main results are outlined here. A list of word pairs where unaspirated and aspirated dental stops contrast minimally in different positions was recorded (see (2)). Each word was read three times by each of the three speakers in the carrier sentence [pi: \_\_\_\_ gisəŋ] 'I said \_\_\_\_'. The recordings were analysed in *Praat*.

(2) *Material for the acoustic investigation of dental stops*

[t <sup>h</sup> ałga]	талаа 'steppe-RFL'	[tałga]	далаа 'shoulder-blade-RFL'
[a <sup>h</sup> ta]	атаа 'camel gelding-RFL'	[ata]	адаа 'demon-RFL'
[a <sup>h</sup> t]	ат 'camel gelding'	[at]	ад 'demon'

The duration of the occlusion phase, of postaspiration, and of preaspiration was measured from wave-form plots and spectrograms. The results of the measurements are shown in (3), and they are illustrated in Figure 2.1, which shows the timing of the dental stops *t<sup>h</sup>* and *t* for speaker DD.

The duration of the occlusion phase was measured for initial, medial, and final stops. We found no significant difference in the duration of the occlusion phase for aspirated and unaspirated consonants.

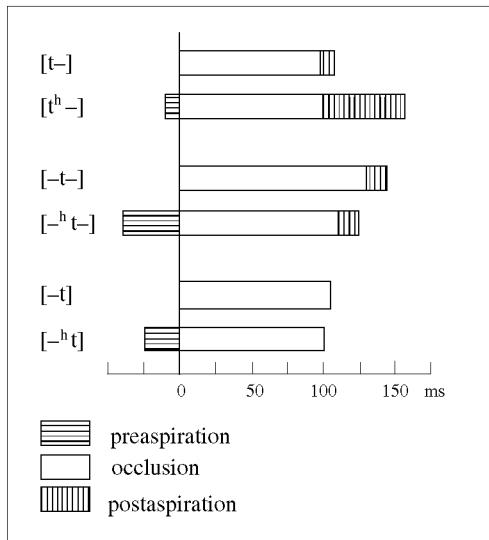


FIGURE 2.1 Timing of dental stops. Speaker DD.

Postaspiration was measured by the voice onset time (VOT), including the short explosion phase. It could be measured in initial and medial position in our material, but not word-finally. The main reason for this is that it was often impossible to find the boundary between a final stop and the initial stop (in some cases fricativized) of the word [gisəŋ] in the carrier sentence. Audibly there is no postaspiration word-finally, however, and additional observations made on words said in isolation by other speakers showed no word-final postaspiration. In word-initial position, VOT is very short for unaspirated consonants, and it is always greater for the aspirated ones. The difference is large and shows a clear statistical significance. In medial position, the difference in VOT is small and not significant. Our conclusion is that postaspiration is consistent and salient in initial, but not in medial or final position.

The final part of the vowel preceding an aspirated stop is usually pronounced with clearly audible aspiration noise and is at least partially devoiced. The duration of preaspiration was measured from the beginning of the devoicing of the vowel to the beginning of the closure phase of the consonant. Preaspiration is most salient when the preceding vowel is in the same word, that is, when the consonant is in medial or final position, but occurs also in the vowel [i:] of the first word [pi:] 'I' of the carrier sentence when it precedes an aspirated consonant. For example, the sentence frame with the word [tʰalʒal] 'steppe–RFL' is pronounced [pi:tʰalʒagisə] 'I said steppe'. The fact that aspirated stops have preaspiration in all positions shows that this is a consistent phonetic correlate differentiating aspirated and unaspirated stops, although it cannot be realized in utterance-initial position. Preaspiration does not occur with unaspirated stops.

## (3) Duration of dental stops (ms) (mean of three readings)

			preaspiration	occlusion	postaspiration
<i>initial:</i>	BB	t <sup>h</sup>	18	64	57
		t	—	75	22
	DD	t <sup>h</sup>	11	99	58
		t	—	98	11
	HB	t <sup>h</sup>	10	68	40
		t	—	65	23
<i>medial:</i>	BB	t <sup>h</sup>	39	117	20
		t	—	134	16
	DD	t <sup>h</sup>	41	110	15
		t	—	129	13
	HB	t <sup>h</sup>	39	123	19
		t	—	117	14
<i>final:</i>	BB	t <sup>h</sup>	30	123	
		t	—	130	
	DD	t <sup>h</sup>	26	100	
		t	—	104	
	HB	t <sup>h</sup>	15	98	
		t	—	107	

The contrast between aspirated and unaspirated stops in different positions is illustrated in Figures 2.2–2.4 with wave-form plots and spectrograms of words read in isolation by a female Ulaanbaatar speaker, Ènhmaa (EM), age forty-five. She was recorded in Moscow in 2001, using a DAT cassette recorder. The figures were made with *WaveSurfer*. When an aspirated stop is preceded by a sonorant, aspiration is realized as devoicing of the sonorant, as illustrated for [ʒ] in Figure 2.5 (cf. Galsan 1969). This effect has been observed across word boundaries as well, devoicing a word-final sonorant before a word beginning with an aspirated consonant.

In conclusion, our data may be interpreted as showing that preaspiration is the main distinctive property, which is realized as such in those positions where this is

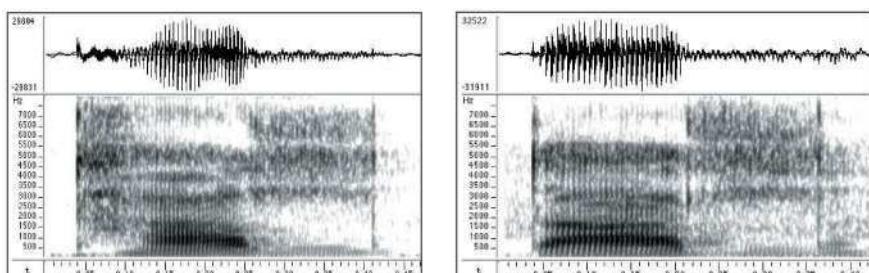


FIGURE 2.2 Wave-form and spectrogram for [t<sup>h</sup>al] тал ‘steppe’ (left) and [taʒ] дал ‘shoulder-blade’ (right). Speaker EM. Aspiration is seen as high frequency noise in the spectrograms. There is a clear difference in VOT between [t<sup>h</sup>] and [t].

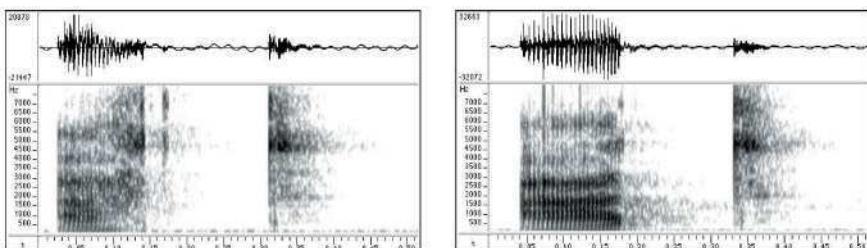


FIGURE 2.3 Wave-form and spectrogram for [a<sup>h</sup>t] at ‘camel gelding’ (left) and [at] ад ‘demon’ (right). Speaker EM. Preaspiration can be seen as high-frequency noise in the second half of the vowel preceding the aspirated stop, and also as blurring of the vowel formants. The releases (explosion phases) are similar for the two stops, and there is no contrastive postaspiration.

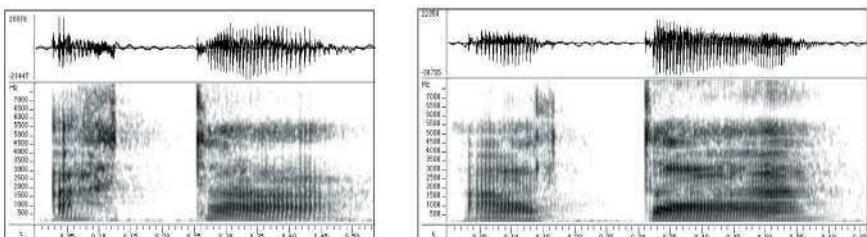


FIGURE 2.4 Wave-form and spectrogram for [a<sup>h</sup>t] ааа ‘camel gelding–RFL’ (left) and [ata] адада ‘demon–RFL’ (right). Speaker EM. Here, as well, the releases are similar for the two stops, and there is no contrastive postaspiration.

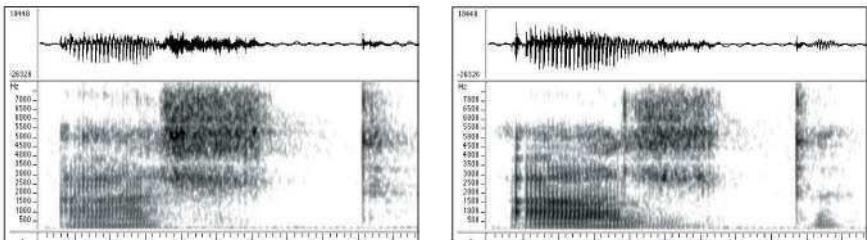


FIGURE 2.5 Wave-form and spectrogram for /alʒʰt/ [a<sup>h</sup>t] алт ‘gold’ (left) and /alʒt/ [alʒt] алд ‘fathom’ (right). Speaker EM. The lateral fricative /ʒ/ is rather voiceless for some speakers, but at least its first part is usually voiced. Before an aspirated consonant it becomes completely voiceless and has more high-frequency noise.

possible. Word-initially, or at least utterance-initially, preaspiration is phonetically impossible so it has to be realized as postaspiration instead.

Preaspiration is not very common among the world’s languages. Medial and final preaspiration and initial postaspiration seem to be the normal pattern in languages with preaspiration, such as Scottish Gaelic and Icelandic. These languages also have devoicing of sonorants preceding preaspirated stops. See Helgason (2002) for a general survey of preaspiration.

### 2.1.1 *Stops in other Mongolian dialects*<sup>3</sup>

Köke and Coyijongjab (1999: 121) made instrumental phonetic investigations of the Chahar dialect of Mongolian. They analyse the stops as (post)aspirated vs. unaspirated voiceless, and do not report preaspiration. They give data on VOT and the duration of the occlusion phase, presumably for words said in isolation, showing that the occlusion phase is much longer for aspirated stops compared to unaspirated stops (in word-medial position). Their VOT values are similar to ours in word-initial position, but not word-medially. Their Figure 52 (p. 223) shows rather heavy postaspiration on word-medial [t<sup>h</sup>], and no visible preaspiration. They do not show figures of word-final aspirated stops, but our informal listening to Mongolian dialects spoken in China (including Chahar) suggests that there is preaspiration in this position. A preliminary conclusion is that Chahar and other Mongolian dialects spoken in China have preaspiration only word-finally, and postaspiration in other positions. This needs to be investigated further, however.

### 2.1.2 *Buriad and Kalmuck stops*<sup>4</sup>

As is the case for Mongolian proper, there is no consensus in the literature about the analysis of the stops in the closely-related languages Buriad and Oirad (including Kalmuck). Instrumental phonetic studies of Buriad stops were made by Bajčura (1978) and Soktoeva (1980a; 1981a, b; 1983; 1984; 1988; 1989a). Bajčura (1978: 2) says that Buriad strong consonants are almost twice as long as the corresponding weak consonant, citing Bajčura (1961: 144), where he says, however, that strong and weak consonants have almost the same duration. Soktoeva (1981a) says that the difference between the Buriad stop series depends on the presence or absence of voicing (*v učastii ili v otsutstvii golosa*), as in Russian, but in Soktoeva (1983; 1988) maintains that relatively long duration is the most important phonetic correlate of strong Buriad stops, although this is often accompanied by a voiceless (*gluhoj*) vs. voiced (*zvonkij*) difference which is, however, phonologically irrelevant. Several earlier researchers, including Poppe (1930b) and Ramstedt (1957: 42), analyse Buriad and Kalmuck weak stops as being voiced, unlike those in Mongolian proper.

This agrees with our informal observations. Figure 2.6 shows the word for ‘hero’ (whose Halkh form is [pa:<sup>h</sup>tär] ɓaaṛap) said in isolation by three male speakers, of (Hori) Buriad, (Dörbed) Kalmuck, and Halkh, respectively. Buriad initial [b] is clearly voiced, and the Kalmuck initial consonant shows voicing as well. In contrast, Halkh has an initial voiceless [p]. The word-medial stop is also different. In Buriad it is a clearly postaspirated [t<sup>h</sup>] and in Halkh a preaspirated [ʰt]. Kalmuck also has postaspiration, although shorter than in Buriad. Another difference between

<sup>3</sup> For sources and notes on stops in Mongolian dialects, see App. C, 2.1.1, p. 221.

<sup>4</sup> For sources and notes on Buriad and Kalmuck stops, see App. C, 2.1.2, p. 221.

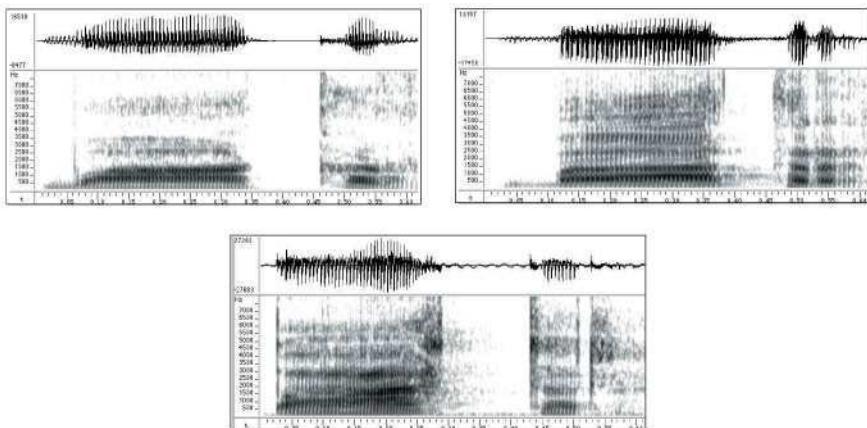


FIGURE 2.6 Wave-form and spectrogram for Buriad [ba:t̥är] (top left), Kalmuck [ba:t̥r̥] (top right), and Mongolian [pa:t̥är] (bottom).

the languages is that the second vowel, which is a reduced [ă] in Buriad and Hahn, is even more reduced in Kalmuck, which has a final syllabic [r̥]. All these observations are preliminary, however, and need to be confirmed by more research.

## 2.2 FRICATIVES<sup>5</sup>

There are five fricatives, [x, χ, x<sup>j</sup>, s, š]. Velar [x] occurs in words with non-pharyngeal vowels [e, o, u] and uvular [χ] in words with pharyngeal vowels [a, ɔ, ʊ] (cf. 3.2.2). The palatalized fricative [x<sup>j</sup>] probably has a purely palatal pronunciation.

The sibilant fricatives [s, š] are postaspirated in word-initial and medial position, see Figure 2.7. In some cases there is devoicing of a preceding vowel, but this is less consistent. In connection with this, it can be noted that Old Mongolian \*s groups with the aspirated stops in the historical phonological process of deaspiration (see 10.10).

## 2.3 NASALS<sup>6</sup>

There are six nasals [m, m<sup>j</sup>, n, n<sup>j</sup>, ŋ, N]. Velar [ŋ] occurs only in words with non-pharyngeal vowels and uvular [N] only in pharyngeal words. Unlike the other nasals, these two are found only in syllable codas, and in connected speech they are normally realized only as nasalization of the preceding vowel, or of its final part if it is long (see Fig. 2.8).

<sup>5</sup> Köke (1998a).

<sup>6</sup> Bulucilagu (1985c); Soktoeva (1985).

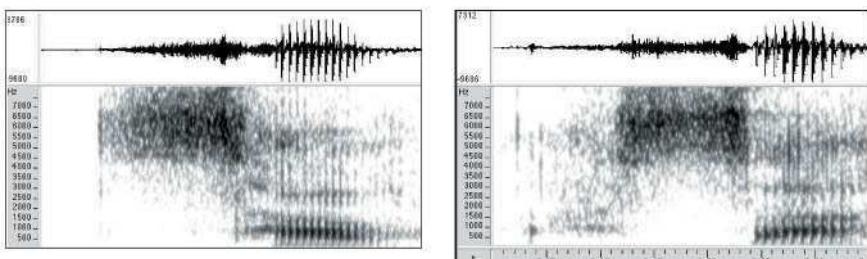


FIGURE 2.7 Wave-form and spectrogram for the words /saw/ [s<sup>h</sup>aw] cab ‘vessel’ (left) and /asax/ [as<sup>h</sup>ax] acaax ‘to light–FUTP’ (right) said in isolation by Speaker DD. Postaspiration of [s] is seen as noise with lower frequency than the sibilant noise. The initial *a* in *asax* is completely devoiced.

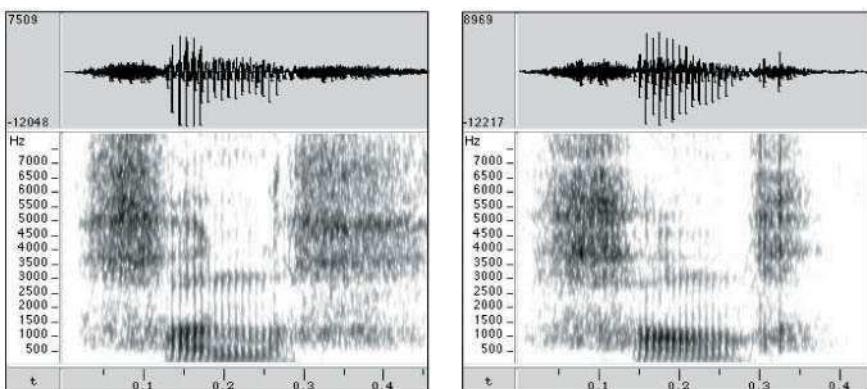


FIGURE 2.8 The nasals /n/ vs. /ŋ/. The words /χənx/ [χənχ] xənox ‘to stay overnight–FUTP’ (left) and /χəŋχ/ [χəŋχ] xənh ‘bell’ (right) said in isolation by Speaker HB. In the first word, the vowel [χ] is not very nasalized, and the nasal is consonantal, but in the second word there is a nasalized vowel and no nasal consonant.

## 2.4 LIQUIDS<sup>7</sup>

The liquids in Mongolian are the lateral fricative [ʒ], the vibrant [r], and the corresponding palatalized consonants [ʒ<sup>j</sup>, r<sup>j</sup>]. The presence of the lateral fricative [ʒ] while a plain lateral [l] is absent is a typologically unusual feature. This conspicuous pronunciation of the lateral is seldom mentioned in the literature; exceptions are Ramstedt (1902: 27) and Saitô (1986: 116). There is a tendency to devoice [ʒ], speaker BB does this consistently, while the other speakers DD and HB have at least partially voiced [ʒ], except before aspirated stops.

There is also a voiceless lateral [ɬ] found in word-initial position in a few Tibetan loan-words. It differs from [ʒ] not only by being voiceless but also by having

<sup>7</sup> Soktoeva (1985; 1986c); Guw-a (1995); Köke (1996).

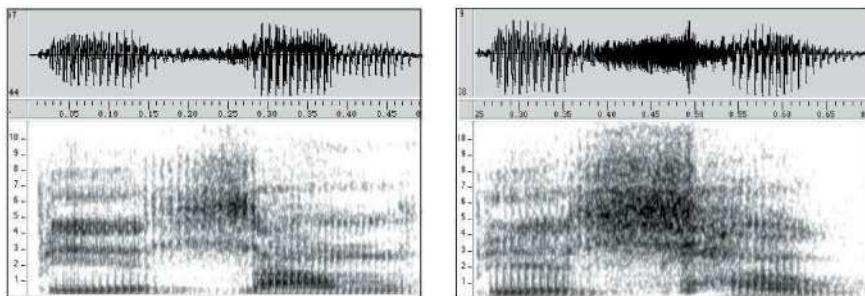


FIGURE 2.9 Wave-form and spectrogram for [ʃam] лам 'lama' (left) and /ʃagw/ [ʃaɣʷ] лхагва 'Wednesday' (right). Speaker DD. The first word [pi:] of the carrier sentence is seen in the figures.

higher intensity and more high-frequency noise (see Fig. 2.9), and it is differentiated from [ʒ] even by those speakers who devoice [ʒ]. [ʃ] often consists of two phases; the second phase may be described as strong postaspiration.

The /r/ phoneme is usually pronounced as a vibrant [r] or a flap [ɾ] by Speakers DD and HB, but as a fricative [ɹ] (often devoiced word-finally) by Speaker BB.

## 2.5 GLIDES

The glide [w] (and palatalized [w<sup>j</sup>]), which has developed historically from the Old Mongolian stop \*p when it occurred after a vowel, functions phonologically as a consonant. Phonetically, [w] is less rounded than e.g. English [w] and is sometimes described as a bilabial fricative [β]; it is, however, a glide (approximant) rather than a fricative.

A consonant that can probably be described as a labialized uvular glide (written [ʁʷ] by us) is found in a few Tibetan loan-words, including [laʁʷ] лхагва 'Wednesday' (cf. Fig. 2.9). We regard it as the phonetic realization of the consonant cluster /gw/.

## 2.6 PALATALIZED CONSONANTS

As mentioned above, palatalized consonants [p<sup>jh</sup>, t<sup>jh</sup>, p<sup>j</sup>, t<sup>j</sup>, g<sup>j</sup>, x<sup>j</sup>, m<sup>j</sup>, n<sup>j</sup>, ʒ<sup>j</sup>, r<sup>j</sup>, w<sup>j</sup>] contrast with the corresponding plain consonants, but only in words with pharyngeal vowels. Palatalized consonants coarticulate with surrounding vowels, decreasing F1 and increasing F2 in adjacent parts of the vowels (cf. 1.3). This is illustrated with stylized formant tracings in Figure 2.10.

Palatalized and plain consonants do not contrast after *i*-diphthongs, and our acoustic investigation shows that consonants in this position are phonetically palatalized. Figure 2.11 shows stylized formant tracings of plain [ʒ] and palatalized

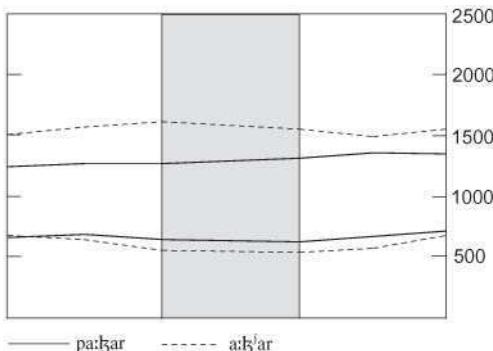


FIGURE 2.10 Stylized formant tracings (F1 and F2) for the words [pa:l̪ar] баалар ‘lap-dog–INST’ and [a:l̪ar] аалар ‘manner–INST’, based on three readings of isolated words by Speaker BB. F1 and F2 were measured at the beginning, middle, and end of the vowels. The shaded area represents the intervocalic consonant.

[l̪<sup>j</sup>] after [a:<sup>j</sup>] and of non-contrastive [l̪<sup>(j)</sup>] after [ai]. The vowel after the consonant is /i/. It is clear that the consonant is palatalized after [ai], and that the following /i/ is pronounced [i] rather than [ɪ] in this case (cf. 1.1.2). This seems to be the only case of progressive palatalization in Halk. Since palatalization is not contrastive in this environment, and since we have not investigated how far the palatalizing influence of the diphthong reaches, we will normally write plain consonants after i-diphthongs, except in detailed phonetic transcriptions; we thus write the word exemplified in Figure 2.11 as *ail̪ig* айлыг although the pronunciation is [ail̪<sup>j</sup>ig] (and not [ail̪ig], as the Cyrillic spelling suggests).

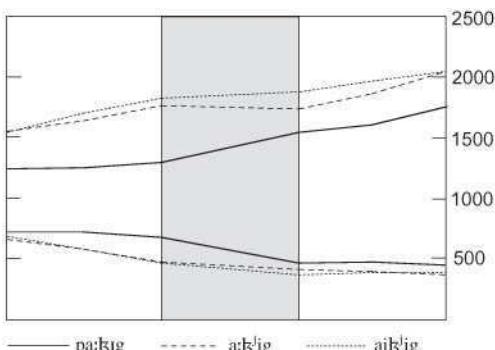


FIGURE 2.11 Stylized formant tracings (F1 and F2) for the words [pa:l̪ig] баалыг ‘lap-dog–ACC’, [a:l̪ig] аалыг ‘manner–ACC’, and [ail̪ig] айлыг ‘family–ACC’ based on three readings of isolated words by Speaker BB. F1 and F2 were measured at the beginning, middle, and end of the vowels. The shaded area represents the intervocalic consonant.

## PHONEMES

In this chapter we analyse the Mongolian segmental phonemes, with the phonetic investigations in the previous chapters as the basis. Our analysis differs in many respects from previous analyses by Western authors, such as Ramstedt (1902), Poppe (1951a; 1970), or Street (1963), but is more similar to the analyses of some Russian, Chinese, and Japanese authors, in particular Saitô (1985; 1986).

### 3.1 VOWEL PHONEMES<sup>1</sup>

There are seven basic vowels in Mongolian:

(1)	i	u
	ø	
e	o	
a	ɔ	

There is contrasting vowel length, but long vowels occur only in word-initial syllables. The short vowel *o* is realized as [œ], and the short vowel *e* occurs only in non-initial syllables (see 1.1). Four of the vowels form diphthongs with *i*. In initial syllables, there are thus three kinds of contrasting vowels, short, long, and diphthongs:

(2) *Vowel phonemes in initial syllables*

short	long	diphthongs
i u	ii uu	ui
ø	oo	øi
o	ee oo	
a ɔ	aa ɔɔ	ai ɔi

Words illustrating these contrasts are:

(3) *Vowel contrasts*

il̥	иil̥ ‘clear’	tiil̥	дийл ‘to win’	
		eeł	ээл ‘blessing’	
ał̥	ał̥ ‘to kill’	aał̥c	аалз ‘spider’	
			aił̥	айл ‘encampment’

<sup>1</sup> Rygaloff (1973); Möömöö (1975); Bitkeev (1982; 1985b); Luvsanvandan (1982a); Norjin (1991; 1992a); Kökebars (1999). For the diphthong *ua*, see Vladimircov (1929: 299).

uɛ үл ‘not’	uuɛ үүл ‘cloud’	uiɛ үйл ‘deed’
uɛ үл ‘sole’	uuɛ үүл ‘mountain’	uiɛ үйл ‘to cry’
oɛ өл ‘grey’	ooɛ өөл ‘to trim’	
əɛ өл ‘to find’	pəɛ боол ‘slave’	əiɛ ойл ‘to understand’

In addition to these vowels, there are a few marginal diphthongs and triphthongs. The diphthong *ua* and the triphthong *vai* occur in a few words, mostly Chinese loans. Except for the word *šuaic* шуайз ‘brush’ (Ch *shuāizi* 刷子) and perhaps a few others, they follow the consonants *x* or *g*. Some examples are *guanc* гуанз ‘restaurant’ (Ch *guānzi* 館子), *xvar* хяар ‘flower’ (Ch *huār* 花兒), *xvais* хуайс ‘acacia’ (Ch *huáishù* 槐樹), and *guai* гуай ‘Mr’, which goes back to Classical Mongolian *abugai*. A possible interpretation with labialized consonants *xʷ*, *gʷ*, was proposed by Saitô (1986) (see also 5.4.2). The diphthong *au* has been found only in the word *auga* ауга ‘mighty’.

### 3.1.1 Non-initial vowels<sup>2</sup>

Non-initial syllables can have two kinds of vowels, full and reduced. These have usually developed from long and short vowels at an earlier stage in the historical development of the language (see 10.3, 10.5). We showed in section 1.1 that the quality of a reduced vowel is predictable, being a centralized version of the vowel in the preceding syllable, except that a reduced vowel following [u] is a centralized version of [e]. As is the case for vowel harmony, this rule ignores intervening *i*. For instance, *mači* [mači] мажий ‘to die’ and *ək̡i* [ək̡i] олий ‘to squint’ have the habitual forms [mačit̥əg] мажийдаг and [ək̡it̥əg] олийдог, where the quality of the reduced vowel depends on the vowel preceding [i].

The quality of a reduced vowel depends on the preceding consonant as well: it is [i]-like if the preceding consonant is an alveopalatal (š, čʰ, č) or a palatalized consonant (*p̥j*, *t̥j*, *p̥i*, *t̥i*, *g̥i*, *x̥i*, *m̥i*, *n̥i*, *k̥i*, *r̥i*, *w̥i*). Examples are the reduced vowels in [ačiɛ] ажил ‘work’ and [at̥iɛ] адил ‘like’.

We will show in Chapter 6 that not only the quality, but also the places, where → reduced vowels occur are predictable. Thus they can be inserted (epenthesized) by a rule, and need not be present in phonological representations. In our usual notation of Hakh words, we will write out the epenthetic vowels as schwas (ə), however, so that we write e.g. *xamər* for [xamär] хамар ‘nose’, *pək̡ər* for [pək̡ər] болор ‘crystal’, *ačək̡* for [ačiɛ] ажил ‘work’, and *at̥ək̡* for [at̥iɛ] адил ‘like’; the phonological representations of these words are /xamr/, /pək̡r/, /ačiɛ/, /at̥iɛ/.

Under our analysis, where the reduced vowels are epenthetic, the full vowels are the only remaining phonemic vowels in non-initial syllables. Since there is no

<sup>2</sup> Vladimircov (1929: 311ff.); Bosson and Unensečen (1962); Luvsanvandan (1964a; 1969); Tömörcérén (1968); Sun (1981); Rialland and Djamouri (1984); Mikami (1985; 1986); Kurabayashi (1988; 1992); Köglüti (1991–2); Köke and Coyijongjab (1996); Köke and Sodobagatur (1996); Svantesson and Franzén (1996); Sodobagatur (1999). *Kalmuck*: Street (1962); Pavlov (1982); Pavlov and Esenova (1986).

length contrast, we analyse the full non-initial vowels as having short (unmarked) quantity, although they have developed historically from long vowels. This analysis is supported by the fact that the durations of full non-initial vowels are intermediate between long and short vowels in initial syllables, but closer to the short vowels (see 1.1). The phonemic vowels in non-initial syllables can be either monophthongs or diphthongs (4). The contrasting possibilities of non-initial vowels are reduced further by vowel harmony (see 5.2).

As seen in section 1.1.2, the phoneme /i/ has two allophones, [i] and [ɪ], in non-initial syllables. The former occurs in words with non-pharyngeal vowels, and also after palatalized and alveopalatal consonants in pharyngeal words, the latter elsewhere in pharyngeal words. Initial /i/ is found only in non-pharyngeal words, so it is always pronounced [i].

(4) *Phonemic vowels in non-initial syllables*

*monophthongs      diphthongs*

i	u	ui
v		ʊi
e	o	
a	ɔ	ai ɔɪ

In the literature, there are at least four other ways of treating non-initial vowels:

- (a) Full vowels are regarded as allophones of long vowels, and reduced vowels are regarded as allophones of short vowels. This analysis lies behind the Cyrillic Mongolian script, and is usually assumed in traditional descriptions, for instance Poppe (1951a).
- (b) As (a), except that reduced vowels are regarded as allophones of a separate schwa vowel phoneme /ə/. The reduced vowel [ɪ], however, is treated as an allophone of /i/ (Street 1963; Poppe 1970).
- (c) Stuart and Haltod (1957) adopt the analysis that reduced vowels are epenthetic and absent from phonological representations, except that [ɪ] is an allophone of /i/. Full vowels in non-initial syllables are analysed as short, except that [i] is regarded as long /ii/. This is necessary because they do not recognize palatalized consonants as phonemes. Kakudô (1974) has a similar analysis.
- (d) Rialland and Djamouri (1984) adopt the same analysis as Stuart and Haltod, except that they regard all full non-initial vowels as long. They regard [ɪ] after alveopalatal sibilants as non-phonemic, but it is not clear how they would treat [ɪ] after palatalized consonants.

These different ways of analysing non-initial vowels are illustrated in (5), showing words in Cyrillic Mongolian, in phonetic transcription, in the phonemic analysis adopted here, and in the four other analyses (in our interpretation, and using our segment notation).

(5) *Different analyses of non-initial vowels*

	<i>our analysis</i>	(a)	(b)	(c)	(d)
саармаг	[saarmäg] ‘neutral’	/saarmg/	/saarmag/	/saarməg/	/saarmg/
хоёр	[xɔjɔr]	‘two’	/xɔjr/	/xɔjɔr/	/xɔjr/
санаа	[sana]	‘thought’	/sana/	/sanaa/	/sana/
ажил	[ačilʒ]	‘work’	/ačlʒ/	/ačilʒ/	/ačlʒ/
адил	[atilʒ]	‘like’	/atilʒ/	/atilʒ/	/atilʒ/
миний	[mini]	‘my’	/mini/	/minii/	/minii/

3.2 CONSONANT PHONEMES<sup>3</sup>

The total inventory of contrasting consonants is given in (6). Phonemes shown in brackets are marginal, occurring only in loan-words (see 3.3) and some onomatopoeics.

(6) *Mongolian consonant phonemes*

	<i>labial</i>	<i>palatalized labial</i>		<i>dental</i>	<i>alveopalatal</i>		<i>palatal</i>	<i>velar</i>	<i>uvular</i>
<i>voiceless aspirated stops</i>		(p <sup>h</sup> )	(p <sup>jh</sup> )	t <sup>h</sup>		t <sup>jh</sup>			
<i>voiceless unaspirated stops</i>	p	p <sup>j</sup>		t		t <sup>j</sup>			
<i>voiced stops</i>							g <sup>j</sup>	g	G
<i>voiceless aspirated affricates</i>				c <sup>h</sup>	č <sup>h</sup>				
<i>voiceless unaspirated affricates</i>				c	č				
<i>voiceless fricatives</i>				s	š	x <sup>j</sup>	x		
<i>nasals</i>	m	m <sup>j</sup>		n	n <sup>j</sup>			ŋ	
<i>voiced lateral fricatives</i>				ł	ł <sup>j</sup>				
<i>voiceless lateral fricative</i>				(ł)					
<i>rhotics</i>				r	r <sup>j</sup>				
<i>glides</i>	w	w <sup>j</sup>					j		

As shown in Chapter 2, the aspirated consonants are postaspirated in word-initial position, and preaspirated in word-medial and word-final position. The distribution of consonants differs considerably between word-initial and non-initial (medial or final) positions. Due to the suffixing nature of the language, the contrasting possibilities are usually the same in medial and final position. When a suffix is

<sup>3</sup> Möömöö (1976; 1977); Luvsanvandan (1982b); Saitō (1986; 1996b); Sanžaa (1988; 1990). *Final n, y*: Lutajirgal (1990); Pěljei (1992).

added, a final consonant becomes medial and is usually not changed (e.g. *xɔt<sup>h</sup>* хот ‘town’, ablative *xɔt<sup>h</sup>ɔs* хотоос, comitative *xɔt<sup>h</sup>t<sup>h</sup>ɔi* хоттой). The only exception is *ŋ*, which changes to *n* when a suffix beginning with a vowel or a dental consonant is added (see 5.3).

Vowel harmony affects the consonant system as well. As seen in section 1.1.1, the vowels can be divided into two classes which cannot co-occur in the same word. The classes are based on the feature [pharyngeal], so that *a, ɔ, u* are pharyngeal vowels and *e, o, i* are non-pharyngeal. The non-pharyngeal vowel *i* is neutral to vowel harmony (see 5.2 for details). The full set of consonants is found only in words with pharyngeal vowels. The main reason for this is that the contrast between palatalized and plain consonants is upheld only in pharyngeal words, so that the consonant phonemes *p<sup>jh</sup>, t<sup>jh</sup>, p<sup>j</sup>, t<sup>j</sup>, g<sup>j</sup>, x<sup>j</sup>, m<sup>j</sup>, n<sup>j</sup>, ʃ<sup>j</sup>, r<sup>j</sup>, w<sup>j</sup>* do not occur in non-pharyngeal words (cf. Hattori 1983c; Sanžaa 1987a).

The velar nasal *ŋ* never occurs in syllable initial position, and the consonants *ʃ*, *w*, and *r* (and their palatalized counterparts) do not occur in word-initial position in native Mongolian words. A number of loan-words with initial *ʃ* and *w* have been incorporated into the language, however (see 3.3). Words illustrating consonant contrasts in different environments are given in Table 3.1.

TABLE 3.1 Examples of consonants in different positions

(a) Initial and final consonants in pharyngeal words

Word-initial						Word-final					
(p <sup>h</sup> )	(p <sup>jh</sup> )	t <sup>h</sup>	(t <sup>j</sup> )	g <sup>j</sup>	G	p	p <sup>j</sup>	t <sup>h</sup>	t <sup>jh</sup> [h <sup>tj</sup> ]	g <sup>j</sup>	G
p	p <sup>j</sup>	t	(t <sup>j</sup> )	g <sup>j</sup>	G	p	p <sup>j</sup>	t	t <sup>j</sup>	g <sup>j</sup>	G
		c <sup>h</sup>	č <sup>h</sup>					c <sup>h</sup> [h <sup>c</sup> ]	č <sup>h</sup> [h <sup>č</sup> ]		
		c	č					c	č		
		s	š	x <sup>j</sup>	x [χ]			s	š	x <sup>j</sup>	x [χ]
m	m <sup>j</sup>	n	n <sup>j</sup>			m	m <sup>j</sup>	n	n <sup>j</sup>		ŋ [N]
		ʃ	(ʃ <sup>j</sup> )					ʃ	ʃ <sup>j</sup>		
		(f)									
								r	r <sup>j</sup>		
(w)			j			w	w <sup>j</sup>			j	

p <sup>h</sup> alʃ	пал	‘splash!’									
p <sup>jh</sup> alʒ	пял	‘plate’									
t <sup>h</sup> alʒ	тал	‘steppe’									
paʃ	бал	‘honey’	at <sup>h</sup>	ат	‘camel gelding’						
p <sup>jh</sup> alʒ	бял	‘to smear’	pɔt <sup>jh</sup>	боть	‘volume’						
taʃ	дал	‘seventy’	xɔt <sup>h</sup> p	холбо	‘to join’						
t <sup>h</sup> aj	даян	‘inn’	xɔt <sup>h</sup> p <sup>j</sup>	холби	‘off’						
gaʃa	гялаа	‘glitter’	at	ад	‘demon’						
gaʃ	гал	‘fire’	cat <sup>j</sup>	задъ	‘nutmeg’						
			ag <sup>j</sup>	агъ	‘wormwood’						
			ag	аг	‘tight’						
			ag	Aga	(Buriad area)						

cham	шам	'mask dance'	ac <sup>h</sup>	ац	'fork'
čpat	чад	'to be able'	ač <sup>h</sup>	ач	'grandson'
cam	зам	'road'	ac	аз	'good luck'
čam	жам	'law'	ač	аж	'to notice'
sał	сал	'raft'	as	ас	'to climb'
šał	шал	'floor'	xaš	хаш	'jade'
xələpər	хялбар	'easy'	ax <sup>j</sup>	ахъ	'to advance'
xał	хал	'to change'	ax	ах	'elder brother'
mał	мал	'cattle'	am	ам	'mouth'
młąga	мялаа	'to anoint'	am <sup>j</sup>	амъ	'life'
nał	нал	'to lean'	an	ана	'to follow'
njał	нял	'to smear'	an <sup>j</sup>	анъ	'to close'
			aq	ан	'beast'
łam	лам	'lama'	ał	ал	'to kill'
łajnхаа	лянхуа	'lotus'	ał <sup>j</sup>	аль	'which'
łam	лхам	'Buddhist deity'	ar	ар	'back'
			xar <sup>j</sup>	харь	'strange'
waar	ваар	'tile'	aw	ав	'to take'
			xaw <sup>j</sup>	хавъ	'near'
jał	ял	'punishment'	aj	ая	'melody'

## (b) Initial and final consonants in non-pharyngeal words

Word-initial				Word-final			
(p <sup>h</sup> )	t <sup>h</sup>				t <sup>h</sup> [ht]		
p	t	g		p	t	g	
	c <sup>h</sup>	č <sup>h</sup>			c <sup>h</sup> [hc]	č <sup>h</sup> [hč]	
	c	č			c	č	
	s	š	x		s	š	x
m	n			m	n		ŋ
	ł				ł		
	(ł)				r		
(w)	j			w		j	

p <sup>h</sup> uu	пүү	'pud (weight unit)'	it <sup>h</sup>	эт	'to spike'
t <sup>h</sup> uu	түү	'to gather'	śilʒp	шилбэ	'shin'
puu	бүү	'don't'	it	ид	'vigour'
tuu	дүү	'younger brother'	ig	иг	'spindle'
guu	гүү	'mare'	ic <sup>h</sup>	эц	'to become weary'
c <sup>h</sup> uu	шүү	'ring'	ič <sup>h</sup>	ич	'right'
č <sup>h</sup> ig	чиг	'direction'	ic	эз	'ill omen'
euu	зүү	'needle'	ič	иж	'total'
čurč	журж	'orange'	is	ис	'soot'
suu	сүү	'milk'	iš	иш	'stem'
šuu	шүү	'saltpetre'			

TABLE 3.1 (*cont.*)

Word-initial			Word-final		
xuu	хүү	‘boy’	ix	их	‘big’
muu	муү	‘mu (area unit)’	im	им	‘earmark’
nuu	нуү	‘to move’	in	энэ	‘this’
			inj	ин	‘millstone’
žuu	лүү	‘jar’	ilž	ил	‘clear’
žuum	лхүмбэ	‘grandiose’	ir	ир	‘blade’
wiic	виз	‘visa’	iw	ив	‘completely’
juu	юу	‘what?’	ij	е	‘harmony’

### 3.2.1 Palatalized consonants<sup>4</sup>

The palatalized consonants are historically conditioned by a following \*i, which disappeared (see 10.11.1). One example is *am<sup>j</sup>* амъ ‘life’ from Old Mongolian \**amin* (contrasting with *am am* ‘mouth’, OM \**aman*). Palatalized and plain consonants do not contrast in words with non-pharyngeal vowels, and as seen in section 2.6 they do not contrast after the diphthongs *ai*, *ɔi*, *ui*.

Palatalized consonants are fairly rare in word-initial position, where they have developed as a result of assimilation of the vowel *i* to a following vowel, for example Old Mongolian \**k<sup>h</sup>ilpar* > *x<sup>h</sup>ačpar* хялбар ‘easy’ (this process is traditionally called ‘breaking’). Palatalized *t<sup>j</sup>, r<sup>j</sup>*, and *w<sup>j</sup>* do not occur initially at all, and *č<sup>j</sup>* and *t<sup>j</sup>* are found only in very few loan-words, including *č<sup>j</sup>aŋxua* лянхуа ‘lotus’ (from Ch *liánhūā* 莲花) and *t<sup>j</sup>aŋ* дян ‘inn’ (Ch *diàn* 店). The palatalized consonants *p<sup>j</sup>, g<sup>j</sup>, x<sup>j</sup>, m<sup>j</sup>, n<sup>j</sup>* are more common in initial position, but occur almost exclusively before *a* or *aa*; see examples in Table 3.1. Palatalized *x<sup>j</sup>* is found before other vowels in a few words, however, such as *x<sup>j</sup>uur* хиур ‘pennant’ and *x<sup>j</sup>uurməg* хиурмар ‘gravel’.

Palatalized *t<sup>j</sup>* and *t<sup>hj</sup>* are not frequent in any position. The historical explanation for this is the non-occurrence of the combinations \**ti* and \**t<sup>h</sup>i* in Old Mongolian; they had probably developed to \**či* and \**č<sup>h</sup>i* already in Pre-Mongolic.

### 3.2.2 Velar and uvular consonants<sup>5</sup>

Velar and uvular consonants alternate with the vowel harmony class of the word, so that velars occur only in words with non-pharyngeal vowels (*i, e, u, o*), and uvulars only in words with pharyngeal vowels (*a, ɔ, ə*). Thus, the phonemes /j, x/ are realized as velars [j, x] in non-pharyngeal words, and as uvulars [N, χ] in pharyngeal words (7a). Even when a suffix beginning with *i* is added to a stem ending in [χ],

<sup>4</sup> For sources and notes on palatalized consonants, see App. D, 3.2.1, p. 222.

<sup>5</sup> For sources and notes on velar and uvular consonants, see App. D, 3.2.2, p. 222.

the uvular pronunciation is retained (7b), although only palatalized or alveopalatal consonants occur before *i* in uninflected pharyngeal words (see 5.2.1). The vowel *i* is written ү in this case.

The velar *g* is an exception. In word-initial position it behaves like the other velars and occurs only in non-pharyngeal words, alternating with *g* in pharyngeal words (7c), but velar *g* may also occur in morpheme final position in pharyngeal words, contrasting with uvular *g* (7d). This contrast is upheld when suffixes are added (7e).

(7) *Velar ~ uvular alternation*

(a)	c <sup>h</sup> ooŋ ɔŋ	[c <sup>h</sup> oɔŋ ~ c <sup>h</sup> ɔŋ] [ɔŋ ~ ɔ̄ŋ]	цөөн он	'few' 'year'	<i>velar</i> <i>uvular</i>
	xiŋ xar	[xiŋ] [χar]	хэл хар	'tongue' 'black'	<i>velar</i> <i>uvular</i>
	sux ax	[sux] [ax]	сүх ах	'axe' 'elder brother'	<i>velar</i> <i>uvular</i>
(b)	sux-ig ax-ig	[suxiŋ] [axiŋ]	сүхийг ахыг	'axe-ACC' 'elder brother-ACC'	<i>velar</i> <i>uvular</i>
(c)	gir gar	[gir] [gar]	гэр гар	'house' 'hand'	<i>velar</i> <i>uvular</i>
(d)	pag pag	[pag] [pag]	баг бага	'team' 'small'	<i>velar</i> <i>uvular</i>
(e)	pag-as pag-as	[pagas] [pagas]	багаас багаас	'team-RFL' 'small-RFL'	<i>velar</i> <i>uvular</i>
	pag-ig pag-ig	[pagiŋ] [pagiŋ]	багийг багыг	'team-ACC' 'small-ACC'	<i>velar</i> <i>uvular</i>

### 3.2.3 Labials

The contrast between *p* and *w* is marginal. The historical reason for this is that Old Mongolian \**p* was ‘weakened’ to *w* in most non-initial positions (see 10.8.1), and is preserved only word-initially and after *m*, *Ծ*, or *w* (e.g. in Ծimp лимбэ ‘flute’, aԾp алба ‘service’, awpəԾ авбал ‘to take–COND’). There was no *w* in Old Mongolian, but it was introduced in initial position in loan-words, so that a new contrast was created, as in *paar* баар ‘to fail’ vs. *waar* ваар ‘tile’ (from Ch *wär* 瓦兒). In final position, contrasts such as /aԾp/ /aԾp алба ‘service’ vs. /aԾ-w/ aԾəw алв ‘to kill–PST’ occur. These words do not contrast minimally on the surface, because of the epenthetic vowel, but the phonological representations have minimally contrasting segmental contents.

The palatalized consonants *p<sup>j</sup>* and *w<sup>j</sup>* have a distribution similar to that of *p* and *w*: *p<sup>j</sup>* occurs only initially or after *m<sup>j</sup>* or *Ծ<sup>j</sup>*, and *w<sup>j</sup>* has not been found initially. We have not found any minimal contrasts between these two consonants, but they might be regarded as separate phonemes in analogy with *p* and *w*.

The consonants  $p^h$  and  $p^{jh}$  occur in some native onomatopoeic and expressive words, e.g.  $p^hat$  пад ‘thud!',  $p^{jh}as$  пяс ‘bang!', and also in loans, for example,  $p^{h}anc$  панз ‘pedlar' (Ch *fānzi* 贩子),  $p^{h}uus$  пүүс ‘company' (Ch *pùzi* 舩子),  $p^{jh}anc$  пянз ‘gramophone record' (Ch *piānzi* 片子),  $p^{jh}a\xi$  пял ‘plate' (Manchu *fila*) (see also 3.3).

### 3.3 LOAN-WORD PHONOLOGY<sup>6</sup>

Numerous loan-words have entered Mongolian, originally from Chinese and Tibetan, and later from Russian and English. It is difficult to decide exactly which borrowed sounds have become regular Mongolian phonemes, since an individual's pronunciation of loan-words depends on his knowledge of the donor language. Thus, those who know Russian well may pronounce [k] and [f] when they occur in loans, but it is common to substitute [x] and [ph] for them.

The phoneme  $\ell$  occurs only in a few loans from Tibetan, the only common word being *laqw* [laq<sup>w</sup>] лхагва ‘Wednesday' (Tib རྒྱତྰ ‘lhag-pa); see section 2.5 for the final consonants of this word. As mentioned in section 3.1 above, the diphthong *ua* (and the triphthong *vai*) appears mainly in Chinese loans.

There are no indigenous words which begin with *r*, but Cyrillic Mongolian writes initial *p <r>* in some Russian and Tibetan loans, e.g. *radio* <radio> ‘radio' (Ru *radio* ráðio) and the name *Rинчен* <Rinčen> (Tib ຮ୍ଯନ୍ତେନ୍ rin-chen). Such words are usually pronounced with an added initial vowel (*aračəw*; *irənčʰəŋ*) (as discussed in this section). In more established loans, the Mongolized form is standard, as in *aršaj* аршаан ‘holy water' (Sanskrit *raśiyana*) and *irtən* эрдэнэ ‘jewel' (Sanskrit *ratna*).

Similarly, word-initial *ʃ* and *w* do not occur in indigenous words, but they have been introduced with loans, e.g. *ʃam* лам ‘lama' (Tib བ୍ରାମ୍ bla-ma), *ʃimp* лимбэ ‘flute' (Tib ག୍ଲିଙ୍ଗ୍ ‘gling-bu), *kaʃ* лал ‘Muslim' (Tib କ୍ଳାକ୍ଲୋ ‘kla-klo); *waar* баар ‘tile' (Ch wär 瓦兒); *wiic* виз ‘visa' (Russian *viza*).

Especially in Soviet times, many Russian loans entered colloquial Mongolian. Their pronunciation varies depending on the speaker's education and knowledge of Russian, and also depending on when, and in which way, the word was borrowed. Some examples are given in Table 3.2, and the ways in which such words were adapted to Mongolian phonology is discussed in this section. In Cyrillic Mongolian, these words are usually spelled as in Russian, except that final unstressed vowels are deleted. If Russian loan-words were written phonemically in Mongolian, the spellings in the far right column in Table 3.2 would be used, but this is normally not done.

In these words, non-Mongolian segments are usually changed to similar Mongolian sounds, so that Russian *f* becomes  $p^h$  (e.g. Ru *fantázija* > Mo *p^hantʰac*;

<sup>6</sup> Vladimirov (1929: 242ff.); Luvsandendev (1958); Sanžeev (1959: 20); Bajarsüren (1978); Darbeeva (1988; 1996: 130 ff.); Guo (1988); Bayarmendü (1989). *Buriad*: Bertagaev (1947); I. D. Buhaeva (1980).

*fártuček* > *p<sup>h</sup>haarč<sup>h</sup>ek*; *figúra* > *p<sup>h</sup>igur*; *váfli* > *paap<sup>h</sup>ək<sup>j</sup>*). Russian *k*, which does not occur in Mongolian, is sometimes retained (*brážka* > *paraš<sup>h</sup>ek*; *knópka* > *kənɔp<sup>h</sup>*; *poká* > *paka*; *protokól* > *p<sup>h</sup>ɔrt<sup>h</sup>kɔ̄ž*; *rjúmka* > *urumk*), but may also be changed to *x* (*kássa* > *xaas*; *kinó* > *x<sup>h</sup>anu*; *kontóra* > *xɔnt<sup>h</sup>ɔ̄r*) or *g/G* (*kolbasá* > *gažəwsa*; *kostjúm* > *gošč<sup>h</sup>ɔ̄m*; *plítka* > *p<sup>h</sup>iližit<sup>h</sup>əg*). Although palatalized dental stops do occur in Mongolian, they are not frequent, and Russian palatalized *d<sup>j</sup>* and *t<sup>j</sup>* are usually rendered as *č* and *č<sup>h</sup>* (*dežúrnij* > *čičur*; *kostjúm* > *gošč<sup>h</sup>ɔ̄m*; *teátr* >

TABLE 3.2 Examples of Russian loan-words in Mongolian

Russian		Mongolian	
avtomát	[avtə'mat]	автомат	'slot-machine'
brážka	[bražke]	бражка	'mash'
dežúrnyj	[dži'ržurnij]	дежурный	'person on duty'
dráma	[drame]	драма	'drama'
fantázija	[fent'azija]	фантазия	'fantasy'
fártuček	[fartutfik]	фартучек	'apron'
figúra	[fɪ'gure]	фигура	'figure'
kássa	[kase]	касса	'cash-desk'
kinó	[k'lno]	кино	'cinema'
knópka	[knopke]	кнопка	'button'
kolbasá	[kəlbe'sa]	колбаса	'sausage'
kontóra	[ken'tore]	контора	'office'
kostjúm	[kes <sup>j</sup> t'vum]	костюм	'dress'
laboránt	[ləbe'rənt]	лаборант	'laboratory assistant'
limonád	[l'iime'nat]	лимонад	'lemonade'
minúta	[mɪn <sup>j</sup> it'nuτə]	минута	'minute'
molokó	[məle'ko]	молоко	'milk'
pívo	[p <sup>j</sup> ive]	пиво	'beer'
plítka	[pl̩itke]	плитка	'stove'
poká	[pe'ka]	пока	'bye!'
protokól	[prətə'kol]	протокол	'protocol'
rádio	[rad <sup>j</sup> e]	радио	'radio'
rezína	[r'i'zina]	резина	'rubber'
rjúmka	[r'ümke]	рюмка	'wine glass'
signál	[s'lg'nal]	сигнал	'signal'
spírt	[sp <sup>j</sup> irt]	спирт	'alcohol'
škáf	[ʃkaf]	шкаф	'cupboard'
šíjápa	[ʃʃápe]	шияпа	'hat'
teátr	[t'i'atr]	театр	'theatre'
trákтор	[traktər]	трактор	'tractor'
váfli	[vafl̩i]	вафли	'waffles'
vagón	[ve'gon]	вагон	'coach'
vazelín	[vəzəl̩'lin]	вазелин	'Vaseline'
víza	[v̩ize]	виза	'visa'
		awt <sup>h</sup> mat <sup>h</sup>	*автмаат
		paraš <sup>h</sup> ek	*бараашик
		čičur	жижүүр
		taram	*дараам
		p <sup>h</sup> anth <sup>h</sup> ac	*пантааз
		p <sup>h</sup> haarč <sup>h</sup> ek	*паарчик
		p <sup>h</sup> igur	*пигүүр
		xaas	*хаас
		x <sup>h</sup> anu	*хянуу
		kənɔp <sup>h</sup>	*конооп
		gažəwsa	*галавсaa
		xɔnt <sup>h</sup> ɔ̄r	*хонтоор
		gošč <sup>h</sup> ɔ̄m	*гошчoom
		žawrant <sup>h</sup>	*лавраант
		žamnat	*лямнаад
		mjanoth <sup>h</sup>	*мянуут
		možko	*молкоо
		p <sup>h</sup> iaaw	*шиав
		p <sup>h</sup> iližit <sup>h</sup> əg	*шиийтэг
		paka	*бакаа
		p <sup>h</sup> ɔrt <sup>h</sup> kɔ̄ž	*порткоол
		aračəw	*араажив
		irceŋ	*эрзээн
		urumk	*үрүумк
		čhagnalž	*чагнаал
		isp <sup>h</sup> irt <sup>h</sup>	*испийт
		iškaw	*ишкав
		šík <sup>h</sup> ap <sup>h</sup>	*шилиап
		čhaat <sup>h</sup> ər	*чаатар
		t <sup>h</sup> araxt <sup>h</sup> ər	*тараахтар
		paap <sup>h</sup> ək <sup>j</sup>	*баапиль
		počəŋ	*богоон
		pacžiŋ	*базлийн
		wiic	*вийз

*č<sup>h</sup>aat<sup>h</sup>ər*); this change is analogous to the historical change of Pre-Mongolic \**t*, \**t<sup>h</sup>* to \**č*, \**č<sup>h</sup>* before \**i* (see 8.7.1).

The quality and place of vowels in Russian loan-words are partially decided by the Mongolian restrictions on word and syllable structure (Chapter 6). There is no length contrast in the Russian vowel system, but stressed vowels have relatively long duration. The stressed vowel in the Russian word becomes a long vowel if it occurs in the initial syllable of the Mongolian word (*fártuček* > *p<sup>h</sup>aarč<sup>h</sup>ək*; *kássa* > *xaas*; *váfli* > *paap<sup>h</sup>ək<sup>h</sup>*; *víza* > *wiic*), and a phonemic (short) vowel if it is non-initial (*dežúrnij* > *čičur*; *fantázija* > *p<sup>h</sup>ani<sup>h</sup>ac*; *kinó* > *xianu*; *kolbasá* > *gačəwsa*; *limonád* > *čjamnat*; *protokól* > *p<sup>h</sup>ɔrt<sup>h</sup>kɔč*; *signál* > *čhagnač*). If a Russian word begins in a way that is impossible in Mongolian, a vowel is inserted to satisfy the word structure requirements. When a word begins with *r*, a vowel is added before it, usually identical to the stressed vowel (*rádio* > *aračəw*; *rezína* > *ircey*; *rijúmka* > *urumk*). Initial consonant clusters are broken up by an inserted vowel, usually identical to the stressed vowel (*brážka* > *parašək*; *dráma* > *taram*; *knópkə* > *kɔnɔp<sup>h</sup>*; *plítka* > *p<sup>h</sup>ičit<sup>h</sup>əg*; *protokól* > *p<sup>h</sup>ɔrt<sup>h</sup>kɔč*; *tráktor* > *t<sup>h</sup>araxt<sup>h</sup>ər*); if the cluster begins with *s* or *š*, the vowel *i* may be inserted before the cluster (*spírt* > *isp<sup>h</sup>irth<sup>h</sup>*; *škáf* > *iškaw*; but *šlzápa* > *šičlap<sup>h</sup>*).

Unstressed non-initial vowels are treated according to the Mongolian rules, that is, they are deleted and then built up by an epenthesis rule (6.2). This means that inadmissible consonant clusters are broken up by epenthetic schwas (*teátr* > *č<sup>h</sup>aat<sup>h</sup>ər*), and final unstressed vowels are deleted (*dráma* > *taram*; *figúra* > *p<sup>h</sup>igur*; *kontóra* > *xɔnt<sup>h</sup>ər*; *pívo* > *p<sup>h</sup>iaaw*; *víza* > *wiic*). If this results in an inadmissible final consonant cluster in Mongolian, a schwa is inserted (*brážka* > *parašək*; *plítka* > *p<sup>h</sup>ičit<sup>h</sup>əg*; *váfli* > *paap<sup>h</sup>ək<sup>h</sup>*). Word-medial unstressed vowels are deleted unless they are required by the Mongolian epenthesis rule (*avtomát* > *awt<sup>h</sup>mat<sup>h</sup>*; *laboránt* > *čawrant<sup>h</sup>*; *limonád* > *čjamnat*; *molokó* > *mɔčko*; *vazelín* > *pacčij*). The same rule may also require a change of the place of a vowel (*kolbasá* > *gačəwsa*; *protokól* > *p<sup>h</sup>ɔrt<sup>h</sup>kɔč*).

The historical ‘breaking’ process, by which initial Old Mongolian \**i* was assimilated to the following vowel (usually \**a*), and the consonant preceding it was palatalized (10.11.1), is also visible in Russian loans, at least as pronounced by people with little knowledge of Russian (*kinó* > *xianu*; *limonád* > *čjamnat*; *minútā* > *mjanut<sup>h</sup>*; *pívo* > *p<sup>h</sup>iaaw*; *signál* > *čhagnač*). Some loans from other languages have gone through ‘breaking’ as well, for example, *p<sup>h</sup>axt<sup>h</sup>ruč* \*пяхтруул ‘gramophone’ (from the trademark *Victrola*).

The Russian stressed vowel is dominant in the loan-words into Mongolian, in the sense that it tends to decide the vowel harmony class, even when it is not found in the initial syllable. As seen above, a copy of a stressed vowel which becomes non-initial in Mongolian is often inserted as the initial vowel of the word (*rádio* > *aračəw*; *rijúmka* > *urumk*; *knópkə* > *kɔnɔp<sup>h</sup>*), and the Russian stressed vowel usually decides the quality of initial unstressed *a* or *o*, which are pronounced in the same way in Russian (*kolbasá* > *gačəwsa*; *vagón* > *pɔčoŋ*). In these ways, and also by eliminating initial *i* by ‘breaking’, the words become regular in relation to

vowel harmony (see 5.2). There is some vacillation, however, and the same Russian word may be treated in different ways by different speakers. For example, the Russian word *pívo* ‘beer’ may be pronounced as *p<sup>h</sup>iιw* or as *p<sup>h</sup>aaw* in Mongolian, words which belong to different vowel harmony classes, as shown, for example, by the instrumental suffix: *p<sup>h</sup>iιwer* but *p<sup>h</sup>aawar*. Similarly, Russian *kinó* ‘cinema’ may be rendered as *x<sup>j</sup>anu* (instrumental *x<sup>j</sup>anugar*) or *kinɔ* (instrumental *kinɔgor*).

## WRITING SYSTEMS

Two different writing systems are presently used for writing Mongolian, the Cyrillic alphabet in the Republic of Mongolia and the Mongolian alphabet in South Mongolia in China. The Mongolian alphabet is the modern form of the Uigur Mongolian alphabet used since the thirteenth century for writing Mongolian (see 8.1).

The Cyrillic alphabet was introduced in Mongolia by a government decision of 25 March 1941. It gradually replaced the old Mongolian script and was made the only official writing system in 1946. At the end of the 1980s, the choice of writing system was widely debated in Mongolia, and in 1991 there was a decision made by Parliament that the old Mongolian script should replace Cyrillic in 1994 for all official purposes. As preparation for this, the old script was taught as the main way of writing Mongolian in the primary schools in 1991–4. This met resistance from the general public, however, and the script reform was suddenly abolished by a decision made by Parliament in July 1994. Cyrillic is now the only widely-used script in Mongolia, although the old script is still officially used beside it (Grivelle 2001). A short-lived attempt to introduce the Latin alphabet in Mongolia was made in 1930–2 (Poppe 1932*b*), and there has also been some recent discussion about this.

It was decided in 1955 that the Cyrillic script should be used by the Mongols in China as well, but this was never implemented, although some publications were printed in Cyrillic Mongolian. The use of Cyrillic Mongolian in China was abolished in 1958 (Svantesson 1991*b*).

### 4.1 CYRILLIC MONGOLIAN

The Cyrillic Mongolian alphabet is given in Table 4.1, together with the Cyrillic alphabets for the two Mongolic languages spoken in the Russian Federation, Buriad and Kalmuck. The conventional transliteration of Cyrillic Mongolian is based on the transliteration of Russian and is phonetically somewhat misleading, since the Mongolian pronunciation of several Cyrillic letters differs from their Russian pronunciation. For practical reasons it is used here for names, and in the bibliography. We follow the ISO transliteration of Cyrillic letters (according to ISO 9: 1995(E)) except in a few cases where it diverges considerably from the usage in the Mongolist literature. We have adopted the convenient ISO transliteration š for ы instead of the more common digraph ѿ.

TABLE 4.1 Cyrillic alphabets for Mongolic languages

			Phonemic transcription		
Letter	Transliteration	Mongolian	Buriad	Kalmuck	
Аа	Aa	a	a, ə, Ø	a, ə	a
Өө	ö (ISO ô)	—	—	ε	
Бб	Bö	b	p	b	b
Вв	Bö	v	w	*	w
Гг	Gö	g	g, g	g	g
Һһ	Hö	h	—	h	g
Дд	Dö	d	t	d	d
Ее	Ee	e	je, ji, jo, jə, j	je, jə/j/e	je/e
Ёё	Ёё	ë	jɔ, ja, j	jɔ, ja/j/ɔ	—
Жж	Жж	ž	č	ž	*
ҖҖ	ҖҖ	ž	—	—	ž
Зз	Zz	z	c	z	z
Ии	Ii	i	i, ə/jə, jɪ, j	jɪ, jə	i
Йй	Йй	j	i	i	j
Кк	Kk	k	*	*	kʰ
Лл	Ll	l	ł	l	l
Мм	Mm	m	m	m	m
Нн	Nn	n	n, ñ	n	n
Ҥҥ	Ҥҥ	ŋ	—	—	ŋ
Оо	Oo	o	ɔ, ə, Ø	ɔ, ə	o
Өө	Өө	ö (ISO ô)	o, ə, Ø	o	ø
Пп	Pp	p	pʰ	pʰ	pʰ
Рр	Rr	r	r	r	r
Сс	Cc	s	s	s	s
Тт	Tt	t	tʰ	tʰ	tʰ
Үү	Үү	u	ʊ	ʊ	u
ҮӮ	ҮӮ	ü (ISO û)	u	u	y
ՓՓ	ՓՓ	f	*	*	*
Хх	Xx	h	x	x	x
Цц	Цц	c	cʰ	*	cʰ
Чч	Чч	č	čʰ	*	čʰ
Шш	Шш	š	š	š	š
ШӮ	ШӮ	š	*	*	*
ҶҶ	ҶҶ	"	Ø	*	*
ӢӢ	ӢӢ	y	i	i	i
ӢӢ	ӢӢ	'	j	j	j
Ҽҽ	Ҽҽ	ë	i, e, ə, Ø	e, ə	e
Юю	Юю	ju (ISO û)	ju, ju	ju, ju/j/u, j <u>u</u>	ju
Яя	Яя	ja (ISO â)	ja, ja, j/a	ja, ja/j/a	ja

Note: Letters marked with the symbol — do not belong to the indicated alphabet. The asterisk symbol, \*, denotes letters which occur only in loan-words. Transcriptions given after a slash (/) occur after consonants: those given before the slash occur in other positions.

In spite of frequent statements to the contrary (see e.g. Rinčen 1958–9: 130 (fn. 2)), the Cyrillic Mongolian script is well-suited to writing modern Halh Mongolian. With few exceptions it is phonemic in the sense that the spelling of a word and its phonemic form are equivalent, so that each one can be derived from the other. But there is no simple one-to-one correspondence between the letters and the phonemes. In this section, the main rules which connect the writing system to the phonemes are given.

In Cyrillic Mongolian, vowels are analysed according to model (a) in section 3.1.1, so that full (phonemic) and reduced (epenthetic) non-initial vowels are written in the same way as long and short initial vowels, respectively. Single vowel letters denote short vowels in initial syllables (1a). The letters и <i> and ё <è> denote the same sound *i* in initial syllables; see section 1.1. In non-initial syllables, single vowel letters denote epenthetic vowels (1b), and in word-final position they are mute (1c).

(1)	(a)	ард	<ard>	art	'people'
		дов	<dov>	tɔw	'mound'
		тул	<tul>	tʰʊlʒ	'because'
		бид	<bid>	pit	'we'
		элс	<els>	ilʒs	'sand'
		хөл	<hööl>	xołʒ	'foot'
		хүн	<hün>	xuŋ	'person'
	(b)	хурал	<hural>	xurəłʒ	'meeting'
		Монгол	<Mongol>	mɔŋgəłʒ	'Mongol'
		ажил	<ažil>	ačəłʒ	'work'
		хүрэн	<hürèn>	xurəŋ	'brown'
		зөвлөл	<zövlöł>	cɔwłəłʒ	'advice'
	(c)	хана	<hana>	xan	'wall'
		чоно	<čono>	čʰɔn	'wolf'
		анги	<angi>	aŋg <sup>j</sup>	'class'
		шонө	<šönö>	šon	'night'
		үнэ	<ünè>	un	'price'

Mute final vowel letters serve to distinguish *n* from *y* and *g* from *g* (see (7) and (8)), and final и <i> shows palatalization of the preceding consonant. In some words the mute letters have no function, and seem to be written just for etymological reasons, as in монгө <möngö> *moyng* 'silver'. Normally, the single letters *y* <u> and *ü* <ü> do not occur in non-initial syllables. Exceptions are some suffixes such as –дугаар/дүгээр <dugaar/dügèer> 'ordinal number'.

Double vowel letters denote long vowels in initial syllables (2a), and phonemic (short) vowels in non-initial syllables (2b).

(2)	(a)	aalз	<aałz>	aałʒc	'spider'
		хоол	<hool>	xɔɔłʒ	'food'
		муур	<muur>	muuṛ	'cat'

ээж	<èž>	eeč	'mother'
өөр	<öör>	oor	'self'
үүл	<üül>	uuž	'cloud'
(b) санаа	<sanaa>	sana	'thought'
долоо	<doloo>	tɔžɔ	'seven'
ааруул	<aaruul>	aaruž	'dried curds'
хүрээ	<bürèe>	xure	'camp'
хөдөө	<hödöö>	xoto	'countryside'
илүү	<ilüü>	ilžu	'more'

The combinations ай, ой, уй, үй <aj, oj, uj, üj> denote *i*-diphthongs (3a). The combination эй <èj> writes non-initial *e* when it alternates with diphthongs in vowel harmony, for example, in the comitative suffix *-tʰai/tʰiilʰe* (3b). It is also used for writing non-initial *e* when the preceding syllable has *o*, as in хөөндэй <hööndèj> *xoonte* 'thrush', and also in some other words, such as хүүхэлдэй < hüüheldej > *xuuχəžte* 'doll'.

The combination ий <ij> denotes long *ii* in initial syllables and phonemic *i* in non-initial syllables (3c). It is used in non-pharyngeal words, and in pharyngeal words after palatalized and alveopalatal consonants.

(3)	(a) ай	<aj>	ai	'to fear'
	ой	<oj>	ɔi	'forest'
	хуй	<huj>	xui	'sheath'
	үйл	<üjl>	uiž	'action'
	(b) гэртэй	<gèrtèj>	girtʰe	'house-COM'
	бөөртэй	<böörtèj>	poortʰe	'kidney-COM'
	(c) хийд	<hijd>	xiit	'lamasery'
	морийг	<morijg>	mɔr̥ig	'horse-ACC'
	зөгий	<zögij>	cogi	'bee'

The letter ы <y> writes a non-palatalizing non-initial *i*, which occurs only in inflectional suffixes, for example, орыг <oryg> 'orig' 'place-ACC'.

The 'soft' vowel letters е, ё, ю, я <e, ё, ju, ja> have several different functions. Word-initially they denote the combination of *j* and a following vowel (4a). The letters е <e> and ю <ju> are ambiguous, denoting *ji* ~ *jo* and *ju* ~ *ju*, respectively. When a soft vowel is written after another vowel inside a word, it denotes *j* plus an epenthetic vowel (4b), and in word-final position the soft vowel letters (chosen so that they formally follow vowel harmony) denote *j* (4c).

(4)	(a) ес	<es>	jos	'nine'
	ер	<er>	jir	'ninety'
	ёс	<ës>	jos	'rule'
	юлхгэр	<julhgèr>	jułxgər	'fat'
	юм	<jum>	jum	'thing'
	яв	<jav>	jaw	'to go'

(b)	яер	<üer>	ujər	'flood'
	хоёр	<hoér>	xɔjər	'two'
	аяга	<ajaga>	ajəg	'cup'
(c)	биे	<bie>	pij	'body'
	гоё	<goë>	gɔj	'elegant'
	я	<uja>	uj	'to tie'

The combination of a soft and a hard vowel letter in word-initial position denotes the combination of *j* and a long vowel (5a); in non-initial position it denotes *j* plus a phonemic vowel (5b). If a word stem ends in *e*, *ë*, *я* <*e*, *ë*, *ja*> and a suffix beginning with *u* or *ü* is added, the stem-final letter is retained and not changed to *ю* <*ju*> as might be expected (5c). In this way, the graphic identity of the stem is preserved.

(5)	(a)	еэвэн	<eèvèn>	jeewəŋ	'mooncake'
		ётон	<öton>	jçøtʰəŋ	'lump sugar'
		юүдэн	<juüdèn>	juutəŋ	'hood'
		яам	<jaam>	jaam	'ministry'
	(b)	эээр	<éeér>	ijer	'harmony-INST'
		өөө	<ööö>	ojo	'tilted'
		оёос	<oëos>	ɔjəs	'seam'
		оюутган	<ojuutan>	ɔjutʰəŋ	'student'
		туяа	<tujaa>	tʰuja	'ray'
	(c)	биеүд	<bieüd>	pijut	'bodies' (бие <bie> pij 'body')
		хоёул	<hoëul>	xɔjuł	'both' (хоёр <hoér> xɔjər 'two')
		хаяул	<hajaul>	xajuł	'to cause to leave' (хая <haja> xaj 'to leave')

There is no special letter for the phoneme *j*. It is written with a soft vowel letter when it is word-initial or preceded by a vowel (see (4) and (5) above). When *j* is preceded by a consonant, it is written with the 'soft sign' ъ <'> and a soft vowel letter: авъяас <av'jaas> awjas 'talent'. Sometimes the 'hard sign' ъ <"> is used instead: авъяас <av"jaas>.

As seen in section 3.2.1, consonant palatalization is phonemic in pharyngeal words. As in Russian, there are no separate letters for the palatalized consonants, and palatalization is indicated in several different ways. In word-final position or when a consonant follows, palatalization is denoted by the 'soft sign' ъ <'> (6a). If there is a final cluster of two palatalized consonants, a final и <i> is written (6b). When an initial palatalized consonant is followed by the short vowel *a*, the soft vowel letter я <ja> is written (6c); other short vowels do not occur in this context. The combinations иа, ио, иу <ia, io, iu> denote palatalization plus a long vowel in initial syllables, where they occur only after x <h> in a few words (6d). In non-initial syllables they are more common, denoting palatalization of the preceding consonant plus a phonemic vowel (6e).

The *i*-coloured epenthetic vowel which occurs after palatalized consonants and alveopalatals is written и <i> (6f).

(6)	(a) говь	<gov'>	gɔw <sup>j</sup>	'semi-desert'
	арыс	<ar's>	ar̥s	'skin'
	(b) салхи	<salhi>	sał̥xj	'wind'
	(c) хяр	<hjar>	x̥ar	'crest'
	(d) хиам	<hiam>	x̥aam	'sausage'
	хиоцгон	<hiocgon>	x̥ɔɔc <sup>h</sup> gəŋ	'hermaphrodite'
	хиур	<hiur>	x̥uur	'pennant'
	(e) авиа	<avia>	aw̥ja	'sound'
	мориор	<moriор>	mɔr̥jɔr	'horse-INST'
	хариул	<hariul>	xar̥iul	'to answer'
	(f) адил	<adil>	ał̥əł̥z	'like'
	ажил	<ažil>	ačəł̥z	'work'

The letter г <g> writes two phonemes, *g* and *g̥*. In non-pharyngeal words, only *g* occurs (7a). In pharyngeal words, г denotes *g̥*, except in morpheme final position, where it denotes *g*. Morpheme final *g* is written with a mute final vowel (7b).

When a suffix beginning with a vowel other than *i* or with *tʰ* is added to a pharyngeal stem ending in *g*, it is impossible to distinguish the *g* from a *g̥* in the writing system (7c).

The combination *gi* (occurring only when a suffix beginning with *i* is added to a stem ending in *g*) is written гы <gy>, and *gi* and *g̥i* are both written гий <gij> (7d).

(7)	(a) гэр	<gèr>	gir	'house'
	зөгий	<zögij>	cogi	'bee'
	үг	<üg>	ug	'word'
	(b) гар	<gar>	gar	'hand'
	зургаа	<zurgaa>	curga	'six'
	бар	<bag>	pag	'team'
	бара	<baga>	pag	'small'
	(c) бараас	<bagaas>	pagas	'team-ABL' (< бар <bag> pag)
	бараас	<bagaas>	pagas	'small-ABL' (< бара <baga> pag)
	зургаа	<zurgaa>	curga	'picture-RFL' (< зураг <zurag> curəg)
	зургаа	<zurgaa>	curga	'six'
	тагт	<tagt>	tʰagtʰ	'cap-AR' (< tar <tag> tʰag)
	тагт	<tagt>	tʰagtʰ	'balcony'
	(d) багыг	<bagyg>	pagig	'small-ACC' (< бара <baga> pag)
	багийг	<bagijg>	pagig	'team-ACC' (< бар <bag> pag)
	агийг	<agijg>	ag̥ig	'wormwood-ACC' (< агъ <ag'> ag̥)

When the letter н <n> is followed by a vowel letter (which is mute in word-final position) or by a dental consonant, it denotes *n* (8a); otherwise it denotes *ŋ* (8b).

(8)	(a) наар	<nar>	nar	'sun'
	үнээ	<ünēè>	une	'cow'
	шөнө	<šönö>	šon	'night'
	хүнс	<hüns>	xuns	'food'

- (b) хaan <haan> хаан ‘Khan’  
 хүн <hün> хүн ‘person’  
 хонх <honh> хөнх ‘bell’

## 4.2 CYRILLIC BURIAD AND KALMUCK

The Cyrillic alphabet is also used for the two Mongolic languages, Buriad and Kalmuck, spoken in the Russian Federation. These languages are described briefly in sections 9.2 and 9.4.

The Buriad and Kalmuck pronunciations of the letters sometimes differ from the Mongolian one, and there are some letters in the Buriad and Kalmuck alphabets which are not found in Mongolian (see Table 4.1). The main difference between the three Cyrillic scripts is, however, the way in which non-initial vowels are treated. We analyse the reduced vowels in Mongolian, Buriad, and Kalmuck as being non-phonemic (except that Buriad word-final schwas are phonemic (see 9.2)), and consequently there is no long ~ short quantity distinction in non-initial syllables. Cyrillic Mongolian and Buriad write full non-initial vowels with double letters, and write reduced vowels with single letters, while Kalmuck writes full vowels with single letters, and does not write out reduced vowels. Thus our analysis agrees with the spelling for Kalmuck, but not for Mongolian and Buriad. These differences are illustrated by the following words:

		<i>pronun-</i> <i>ciation</i>	<i>represen-</i> <i>tation</i>	<i>orthog-</i> <i>rphy</i>	<i>transliter-</i> <i>ation</i>
‘red’	Mongolian:	[ʊʃɑŋ]	/ʊʃɑŋ/	улаан	<ulaan>
	Buriad:	[ʊlan]	/ulan/	улаан	<ulaan>
	Kalmuck:	[ulan]	/ulan/	улан	<ulan>
‘hero’	Mongolian:	[pa: <sup>h</sup> tar]	/paat <sup>h</sup> r/	баатар	<baatar>
	Buriad:	[ba:t <sup>h</sup> är]	/baat <sup>h</sup> r/	баатар	<baatar>
	Kalmuck:	[ba:t <sup>h</sup> ṛ]	/baat <sup>h</sup> r/	баатр	<baatr>

A Kalmuck orthography which writes schwa vowels was officially adopted in 1999, and codified in the dictionary by Omakaeva (2000). It was not widely accepted, however, and was abolished in 2001.

## 4.3 MODERN WRITTEN MONGOLIAN

The old Mongolian alphabet, which was devised as an adaptation of the Uigur alphabet in the thirteenth century, is still used by the Mongols in China. The more or less standardized modern form of the Mongolian script will be referred to as Modern Written Mongolian.

Compared to the original Uigur Mongolian alphabet, the forms of the letters have been changed somewhat, and some sounds which were originally written

with the same letter are now differentiated by diacritic dots, but otherwise the spelling has been changed only marginally. The modern form of the Mongolian alphabet is shown in Table 4.2. As in other alphabets of Semitic origin, the letters have different forms depending on their place in the word: initial, medial, or final. The old Uigur form of the Mongolian script is described in section 8.1.

The standard transcription of Written Mongolian is that of Mostaert (1941–4). We will use this with some modifications: we substitute *c*, *j* for Mostaert's *č*, *ǰ*, which is possible because these letters without a diacritic are not used otherwise in the transcription. We also write *g* for Mostaert's two letters *g* and *γ*, which represent the two Mongolian letters *ঁ* and *ঁ*/*ঁ*. They are in complementary distribution, so that *γ* occurs in words with back vowels (*a*, *o*, *u*), except before *i* and except in the combination *ঁng*; *g* occurs in all other positions. We use this transcription

TABLE 4.2 The Modern Written Mongolian alphabet

initial	medial	final	transcription	Hahn equivalents
ᡳ	ᡴ	ᡵ	a	a, ə, Ø
ᡶ	ᡷ	ᡸ	e	i, e, ə, Ø
ᡷ	ᡸ	᡹	i (y)	i, ə, Ø
᡹	᡺	᡻	u, o	u, ɔ, ə, Ø
᡺	᡻	᡻	ü, ö	u, o, ɔ, Ø
᡻	᡻	᡻	n	n, ñ
᡼	᡼	᡼	b	p, w, Ø
᡽	᡽		p	p <sup>h</sup>
᡾	᡾		q	x
ᡷ	ᡷ	ᡷ	g	g, ɣ, Ø
ᡷ	ᡷ	ᡷ	k, g	x, g, Ø
ᡷ	ᡷ	ᡷ	m	m
ᡷ	ᡷ	ᡷ	l	ł
ᡷ	ᡷ	ᡷ	s	s, š
ᡷ	ᡷ		š	š
ᡷ	ᡷ	ᡷ	t, d	t <sup>h</sup> , t
ᡷ	ᡷ		c	c <sup>h</sup> , č <sup>h</sup>
ᡷ	ᡷ		j	c, č
ᡷ	ᡷ	ᡷ	y	j
ᡷ	ᡷ	ᡷ	r	r

Note: When <ঁ> occurs between two vowels, it is transliterated <y>: *ᠮᠤᠶ* <sayin>, *ᠥᠱ* <bey-e>. There are some extra letters used in transliterations of foreign words. They include *ঁw* or *ঁe*, *ঁf*, *ঁk*, *ঁts*, *ঁz*, *ঁγ* (*ঁh*), *ঁঁ*. The letter *ঁ* is sometimes written word-initially in foreign words, and *ঁ* is written medially; in these cases we transliterate them as *d* and *t*: *ঁ**ঁ**ঁ* <Danzan>; *ঁ**ঁ**ঁ* <sistèm>.

mainly for names and in the bibliography. When Old Mongolian words are discussed, they are given in (reconstructed) phonemic form; see Chapter 8.

The Mostaert transcription is not a strict transliteration, but a kind of reconstruction of the pronunciation at the time when the script was created. It makes several sound distinctions which are not indicated in the Written Mongolian script itself, based on the supposed original pronunciation, also reflected in Halkh and other modern languages. As Table 4.2 shows, the vowels transcribed <u> and <o> are written with the same Mongolian letter, as are <ü> and <ö>. Similarly, the consonants <k> and <g> are not distinguished in writing, nor are <t> and <d>. In syllable coda position (i.e. before a consonant or word-finally), the transcription never writes <q, k, t>.

The vowel harmony alternants <u/o> ~ <ü/ö> are distinguished by the script only in the first syllable, and <a> ~ <e> only in absolute word-initial position.

After the letters ᠮ, ᠥ, ᠦ, ᠨ, ᠩ <q/g, s, m, l, r>, word-final <a/e> is usually written with the letter ᠗ separated from the rest of the word. This is indicated with a hyphen: ᠮ ᠠ ᠗ <qar-a> *xar xap* ‘black’. The form ᠗ also occurs without any space after ᠩ <k/g> and ᠭ <b>: ᠮ ᠠ ᠗ <köke> *xox xex* ‘blue’; ᠮ ᠠ ᠗ <böke> *pox böx* ‘wrestler’. As these examples also show, the vowel ᠠ <u/o/ü/ö> forms the ligature ᠠ with ᠩ <k,g> and ᠠ with ᠭ <b>. For more details on Written Mongolian, see Poppe (1954a).

Because the transcription of Written Mongolian involves some interpretation, different dictionaries and other sources differ somewhat in the transcription. This is mainly a matter of using different symbols, but one point where there is a real difference of interpretation is the choice of *o/ö* or *u/ü* in non-initial syllables. Mostaert and most other sources write *o/ö* when these vowels are supposed to have been present in Old Mongolian, as in the word <Monggol> (or <Mongyol>) ‘Mongol’. We follow the Mongolian–Chinese dictionary *Monggol Kitad tolj* (1999). This dictionary usually writes *o* (or *ö*) rather than *u* (or *ü*) in non-initial syllables of a root when the word-initial syllable has *o* or *ö*, even in some cases where the etymological vowel is *u/ü*. For example, it writes *toso* ‘fat’, although the Old Mongolian form has \**u*: \**t<sup>h</sup>osu/n*.

The correspondence between Written Mongolian and modern Halkh pronunciation is complicated and is best understood in relation to the historical development of Halkh as outlined in Chapter 10. The most common correspondences between the Written Mongolian transcription and the Halkh sounds are shown in Table 4.2.

## PHONOLOGICAL PROCESSES

The most important phonological process in Mongolian is vowel harmony, which is described in detail in section 5.2. The domain of vowel harmony is the (non-compound) word, and vowel harmony functions within roots as well as between roots and suffixes. Thus it belongs both to the basic phonology and to morphophonology. In addition to vowel harmony, some minor morphophonological processes are described in this chapter, but the other major morphophonological process, schwa ~ zero alternation, is treated in the next chapter, since it is closely connected with syllabification.

### 5.1 PHONOLOGICAL REPRESENTATION

One of the most important processes in Mongolic historical phonology is the shift from palatal vowel harmony in Old Mongolian to pharyngeal harmony in modern Mongolian. Using a standard vowel feature system, where the first process is described as spreading of the feature [back], and the second one as the spreading of [ATR], this historical relationship cannot be described without ad hoc rules connecting these two features, which have no natural relation to each other. Following Svantesson (1985), we have chosen to use the place features [pharyngeal], [palatal], and [velar], accepting the ideas about vowel articulation and vowel features developed by Sidney Wood (1975; 1979), based on cineradiographic data from a large number of languages. These features provide a natural articulatory explanation for the Mongolian vowel harmony shift (10.6.1). Similar vowel feature systems are used in several recent phonological theories (see e.g. van der Hulst 1987).

According to Wood, there are four places of vowel articulation (places of narrowest constriction): (1) the hard palate, (2) the soft palate, (3) the uvula and upper pharynx, and (4) the (lower) pharynx. These four vowel articulations are connected with activity in the following muscles:

(1) *Vowel articulation and muscle activity*

<i>place of articulation</i>	<i>muscles involved</i>
palatal (hard palate)	genioglossi
velar (soft palate)	genioglossi, styloglossi
uvular (uvula/upper pharynx)	styloglossi
pharyngeal (lower pharynx)	hyoglossi and pharyngeal constrictors

(manner feature)

Following Wood we will use the three place features [palatal], [velar], and [pharyngeal] ([P], [V], [F]) for the three articulatory gestures which involve the genioglossi, styloglossi, and hyoglossi muscles, respectively. The pharyngeal constrictor muscles may be involved in pharyngeal articulation, which can be combined with the three other places of articulation, so that seven place feature combinations are possible. In addition, the features [open] and [round] ([O], [R]) are relevant for vowels. The feature [open] indicates a relatively low degree of constriction. The feature specifications for those vowels which are relevant for the Mongolic languages are given in (2). We write the symbol  $\emptyset$  only for non-phonemic schwa vowels; phonemic vowels with a schwa-like quality are written as  $\nu$ .

### (2) Features and vowels

		-	R	O	OR
P	palatal	i	y	e	$\emptyset$
PF	pharyngealized palatal	I	Y	ɛ	$\emptyset$
PV	velar	w	u		
PVF	pharyngealized velar		v		
V	uvular		y	o	
VF	pharyngealized uvular				$\emptyset$
F	pharyngeal		a		

We will regard all features as privative, that is as being either present or absent, rather than taking values + or -. This is natural at least for the three place features and the feature [round] since they denote the presence or absence of activity in certain muscles. Privative features (unary elements or particles) are assumed in several phonological theories, such as particle phonology (Schane 1984) and dependency phonology (J. Anderson and Ewen 1987).

The full feature specifications of the seven Halkh vowels are given in (3). The features [palatal] and [velar] do not have any distinctive function in Halkh, and we will normally use the underspecified feature specifications without them.

### (3) Halkh vowel features

	fully specified	underspecified
i	[P]	[]
u	[PVR]	[R]
ø	[PVFR]	[FR]
e	[PO]	[O]
a	[FO]	[FO]
o	[VOR]	[OR]
ɔ	[VFOR]	[FOR]

The underspecified representations have [pharyngeal] as the only place feature, and in order to obtain the correct phonetic realizations of the vowels, the other place features must be filled in by phonetic realization rules (redundancy rules):

(4) *Phonetic realization rules*

- (a) [] > [P] i
- [R] > [PVR] u
- [O] > [PO] e
- [OR] > [VOR] o
- (b) [FR] > [PVFR] ɔ
- [FOR] > [VFOR] ɔ

The four vowels in (4a) can be regarded as unmarked: *u* is the unmarked rounded vowel, *e* the unmarked open vowel, and *o* the unmarked open rounded vowel. The vowel *i*, which is invisible for vowel harmony (see 5.2.1), can be regarded as completely unmarked in Hahl. Together with *a*, which can be regarded as the unmarked pharyngeal vowel, these four vowels make up the most common vowel system in the world's languages, {i, e, a, o, u}, and the rules in (4a), which create this subsystem in Hahl can be regarded as universal default rules in the sense of Archangeli (1988: 35ff.). The remaining two vowels *u* and *ɔ* are obtained by adding the feature [pharyngeal] to *u* and *o*, both in the full and the underspecified representations.

Another motivation for using the feature system in (2) is that it applies to both vowels and consonants and thus is suitable for explaining phonological processes, such as velar ~ uvular alternation in vowel harmony, which involve these two classes of sounds. For the consonants, the additional place features [labial] and [apical] are assumed:

(5) *Place features for consonants*

<i>labials</i> ( $p^h, p, m, w$ )	[labial]
<i>palatalized labials</i> ( $p^{jh}, p^j, m^j, w^j$ )	[labial, palatal]
<i>dentals</i> ( $t^h, t, c^h, c, s, n, \zeta, r$ )	[apical]
<i>alveopalalats</i> ( $t^{jh}, t^j, \check{c}^h, \check{c}, \check{s}, n^j, \zeta^j, r^j$ )	[apical, palatal]
<i>palatals</i> ( $g^j, x^j, j$ )	[palatal]
<i>velars</i> ( $g, x, y$ )	[velar]
<i>uvulars</i> ( $\text{G}$ )	[velar, pharyngeal]

We will assume a representation where the root nodes of the segments are attached to C and V units of a timing ('skeleton') tier (6) (see e.g. Clements and Keyser 1983). In particular, long vowels and diphthongs are represented as in (6b, c).

(6) (a) *t<sup>h</sup>aζx талх* 'bread'      (b) *nuur нүүр* 'face'      (c) *əim̩s оймс* 'sock'

C V C C         t <sup>h</sup> a ζ x	C V V C   √   n u r	V V C C         ɔ i m s
--	---------------------------	-------------------------------

## 5.2 VOWEL HARMONY<sup>1</sup>

Mongolian has vowel harmony which restricts the co-occurrence of vowels within a non-compound word. It affects roots as well as derivational and inflectional suffixes, and only some recent unassimilated loan-words are excepted from vowel harmony. The main type of vowel harmony is based on the feature [pharyngeal] (cf. 5.1 above and the discussion in 1.1.1). There is also rounding harmony which is limited to open vowels.

Pharyngeal harmony divides the basic vowels into two harmony classes, non-pharyngeal and pharyngeal. If the underspecified feature specifications given in (3) above are used, the only difference between the vowel classes is the presence or absence of the feature [pharyngeal]:

(7) *Vowel classes*

<i>non-pharyngeal vowels</i>	<i>pharyngeal vowels</i>
i []	ʊ [FR]
u [R]	a [FO]
e [O]	ɔ [FOR]
o [OR]	

The main rule is that vowels with different values for the feature [pharyngeal] cannot co-occur in the same word. The only exception is the vowel *i*, which has no pharyngeal counterpart. In non-initial position (i.e. when it is not the first vowel of the word) it can co-occur with any initial vowel, and following vowels harmonize with the vowel which comes before the *i*. The vowel *i* is not completely neutral, however, since it functions as a non-pharyngeal vowel when it appears in the initial syllable, forcing the vowels following it to be non-pharyngeal.

Rounding harmony is restricted to open vowels (*e*, *o*, *a*, *ɔ*). The open rounded vowels *o* and *ɔ* can occur in a non-initial syllable only if they are preceded by the same vowel *o* or *ɔ* (except that *i* can intervene, as in pharyngeal harmony). There is an asymmetry between these two vowels, however. The vowel *ɔ* cannot be followed by *a*, but *o* can be followed by *e*. Rounding harmony is triggered only by open vowels, and an open vowel that follows a non-open rounded vowel (*u*, *ʊ*) must be unrounded (*e* or *a*). This gives the following possibilities for vowel sequencing in Mongolian:

(8) *Vowel sequencing*

<i>Vowel in preceding syllable</i>	<i>Possible vowels in following syllable</i>			
i, ii, u, uu, ui, e, ee	i	u	ui	e
o, oo	i	u	ui	e o
ʊ, uʊ, ui, a, aa, ai	i			ʊ ui a ai
ɔ, ɔɔ, ɔi	i			ʊ ui ɔ ɔi

<sup>1</sup> For sources and notes on vowel harmony, see App. E, p. 222.

The effects of vowel harmony are perhaps best seen in suffixes, whose vowels alternate depending on the vowels of the stem. There are five different vowel alternation patterns in suffixes, which can be represented as the phoneme /i/, the archiphonemes /E/ and /U/, and the diphthongs /Ei/ and /Ui/. They are realized as shown in (9). Examples of these patterns are given in Table 5.1.

TABLE 5.1 Examples of vowel harmony in suffixes

The following suffixes are used as examples: /-**Է**/ ‘direct past’, /-**Ո**/ ‘causative’, /-**Խ**ic<sup>h</sup>/ ‘potential’, /-**Ի**g/ ‘accusative’, /-**Թ**Ei/ ‘comitative’.

	DPST	CAUS	POTENTIAL		ACC	COM
‘eat’	it- <b>է</b> e	it- <b>ա</b> ɛ	it-xuič <sup>h</sup>	‘glass’	ši <sup>h</sup> -ig	ši <sup>h</sup> -t <sup>h</sup> e
	и́ләэ	и́дул	и́хүйц		шилийг	шилтэй
‘decide’	šiit- <b>է</b> e	šiit- <b>ա</b> ɛ	šiit-xuič <sup>h</sup>	‘brush’	riiř-ig	riiř-t <sup>h</sup> e
	шийдләэ	шийдүүл	шийдхүйц		бийрийг	бийртэй
‘see’	uc- <b>է</b> e	uc- <b>ա</b> ɛ	uc-xuič <sup>h</sup>	‘axe’	sux-ig	sux-t <sup>h</sup> e
	үзләэ	үзүүл	үзхүйц		сүхийг	сүхтэй
‘jump’	tuuž- <b>է</b> e	tuuž- <b>ա</b> ɛ	tuuž-xuič <sup>h</sup>	‘tail’	suuž-ig	suuž-t <sup>h</sup> e
	дүүлләэ	дүүлүүл	дүүлхүйц		сүүлийг	сүүлтэй
‘be stunned’	tuir- <b>է</b> e	tuir- <b>ա</b> ɛ	tuir-xuič <sup>h</sup>	‘type’	cuiž-ig	cuiž-t <sup>h</sup> e
	дүйрләэ	дүйрүүл	дүйрхүйц		зүйлийг	зүйлтэй
‘decorate’	xeež- <b>է</b> e	xeež- <b>ա</b> ɛ	xeež-xuič <sup>h</sup>	‘gown’	teež-ig	teež-t <sup>h</sup> e
	хээлләэ	хээлүүл	хээлхүйц		дээлийг	дээлтэй
‘give’	og- <b>է</b> o	og- <b>ա</b> ɛ	og-xuič <sup>h</sup>	‘foot’	xož-ig	xož-t <sup>h</sup> e
	өглөө	өгүүл	өгхүйц		хөлийг	хөлтэй
‘decrease’	c <sup>h</sup> oor- <b>է</b> o	c <sup>h</sup> oor- <b>ա</b> ɛ	c <sup>h</sup> oor-xuič <sup>h</sup>	‘kidney’	poor-ig	poor-t <sup>h</sup> e
	цөөрлөө	цөөрүүл	цөөрхүйц		бөөрийг	бөөртэй
‘pleat’	xon <sup>j</sup> - <b>է</b> a	xon <sup>j</sup> - <b>ա</b> ɛ	xon <sup>j</sup> -xuič <sup>h</sup>	‘arrow’	som-ig	som-t <sup>h</sup> ai
	хунълаа	хунуул	хунъхүйц		сумыг	сумтай
‘evaporate’	vorš- <b>է</b> a	vorš- <b>ա</b> ɛ	vorš-xuič <sup>h</sup>	‘cat’	muor-ig	muor-t <sup>h</sup> ai
	үүршилаа	үүршиул	үүршихүйц		муурыг	мууртай
‘cry’	uiž- <b>է</b> a	uiž- <b>ա</b> ɛ	uiž-xuič <sup>h</sup>	‘pole’	t <sup>h</sup> uiž-ig	t <sup>h</sup> uiž-t <sup>h</sup> ai
	уйллаа	уйлуул	уйлхүйц		туйлыг	туйлтай
‘go’	jaw- <b>է</b> a	jaw- <b>ա</b> ɛ	jaw-xuič <sup>h</sup>	‘hand’	gar-ig	gar-t <sup>h</sup> ai
	явллаа	явлуул	явлхүйц		гарыг	гартай
‘be delayed’	saat <sup>h</sup> - <b>է</b> a	saat <sup>h</sup> - <b>ա</b> ɛ	saat <sup>h</sup> -xuič <sup>h</sup>	‘spider’	aažc-ig	aažc-t <sup>h</sup> ai
	саатлаа	саатуул	саатхүйц		аалзыг	аалзтай
‘brag’	sairx- <b>է</b> a	sairx- <b>ա</b> ɛ	sairx-xuič <sup>h</sup>	‘family’	aiž-ig	aiž-t <sup>h</sup> ai
	сайрхлаа	сайрхуул	сайрххүйц		айлыг	айлтай
‘enter’	ər- <b>է</b> o	ər- <b>ա</b> ɛ	ər-xuič <sup>h</sup>	‘place’	ər-ig	ər-t <sup>h</sup> əi
	орлоо	оруул	орхүйц		орыг	ортай
‘be pierced’	c <sup>h</sup> օօր- <b>է</b> o	c <sup>h</sup> օօր- <b>ա</b> ɛ	c <sup>h</sup> օօր-xuič <sup>h</sup>	‘cake’	rɔɔw-ig	rɔɔw-t <sup>h</sup> əi
	цօօрлөө	цօօруул	цօօрхүйц		боовыг	боовтой
‘dart out’	c <sup>h</sup> əiž- <b>է</b> o	c <sup>h</sup> əiž- <b>ա</b> ɛ	c <sup>h</sup> əiž-xuič <sup>h</sup>	‘sock’	əims-ig	əims-t <sup>h</sup> əi
	цойллоо	цойлуул	цойлхүйц		оимсыг	оимстай

(9) *Vowel alternation patterns in suffixes*

<i>Stem vowel</i>	<i>Suffix vowel</i>	i	E	Ei	U	Ui
i, ii, u, uu, ui, ee	i	e	e	u	ui	
o, oo	i	o	e	u	ui	
u, uu, ui, a, aa, ai	i	a	ai	u	ui	
ɔ, ɔɔ, ɔi	i	ɔ	ɔi	u	ui	

The contrast between the five non-initial vowels is illustrated in (10).

- (10) /xar-i/ xari харья ‘to look—OPTATIVE’  
      /xarE/ xara хараа ‘sight’  
      /xarEi/ xarai харай ‘to jump’  
      /xarU/ xaru харуу ‘grit’  
      /xarUi/ xaroi харуй ‘twilight’

The same restrictions that hold for suffix vowels apply to non-initial vowels in stems. Examples of possible vowel combinations in uninflected words are given in Table 5.2.

The vowel harmony examples show that a long vowel and an *i*-diphthong combine with the same vowels in the next syllable as the corresponding short vowel does. We assume that the vowels of non-initial syllables of uninflected words are represented in the same way as suffix vowels. For instance, the words *sana* санаа ‘thought’, *xoto* хөдөө ‘countryside’, *šire* ширээ ‘table’, *čuksu* чулгу ‘stone’, and *xantgai* хандгай ‘elk’ are represented as /sanE/, /xotE/, /širE/, /čuksU/, /xantgEi/.

After the vowels *i*, *u*, *e*, the archiphoneme /E/ and the combination /Ei/ are realized in the same way, as *e*. We will write /Ei/ when *e* alternates with other realizations of /Ei/ (i.e. *ai*, *ɔi*) in suffixes, for example, in comitative /-t<sup>h</sup>Ei/. After the rounded open vowel *o*, the suffix vowel /Ei/ is realized as unrounded *e* (e.g. /poort<sup>h</sup>Ei/ /poort<sup>h</sup>e/ бөөртэй ‘kidney—COM’). The vowel *e* can also occur in stem words after *o*. We assume that *e* is the realization of /Ei/ in this case as well, so that e.g. *xoonte* хөөндэй ‘thrush’ is represented as /xoontEi/.

### 5.2.1 *Transparent i*

Non-initial *i* is transparent in the sense that it is completely ignored by vowel harmony. It is not affected by vowel harmony, nor does it interfere with vowel harmony. This is illustrated by comparing the realizations of reflexive *-E* in (11a), where they follow a suffix containing *i*, with those in (11b) where they follow the stem directly. The intervening *i* makes no difference for the realization of the final suffix; in colloquial Ulaanbaatar Halkh, there is some variation in the realization of *o* in this position (see 5.2.2).

TABLE 5.2 Examples of vowel harmony in uninflected words

pit <sup>h</sup> gi	битгий	'don't!'	siimxi	сиймхий	'gap'
tǐkgur	дэлгүүр	'shop'	šiiču	шийжүү	'gruel' (Ch)
gisgui	гэсгүй	'proctor' (Tib)	č̥iič̥e	чийчээ	'motorcar' (Ch)
sire	ширээ	'table'	t <sup>h</sup> uuixi	туүхий	'raw'
tuži	дулий	'deaf'	t <sup>h</sup> uušu	туүшүү	'back of jaws'
ugui	үгүй	'no'			
une	үнээ	'cow'	šuuge	шүүгээ	'cupboard'
guimxi	гүймхий	'frisky'	peeži	бээлий	'glove'
guilgu	гүйлгүү	'rapid'	ceet <sup>h</sup> u	зээтүү	'mattock'
tuixuich <sup>h</sup>	дүйхүйц	'equivalent' (Ch)			
tuiveŋ	дүйвээн	'noise'			
cogi	зөгий	'bee'	xoomi	хөөмий	'pharynx'
očun	өжүүн	'stubborn'	xooru	хөөрүү	'conceited'
xoto	хөдөө	'countryside'	xoocho	хөөцөө	'heat'
xoxte	хөхдэй	'mythological bird'	xoonte	хөөндэй	'thrush'
murži	мурий	'be bent'	t <sup>h</sup> uočhi	туучий	'lamenter'
č̥uču	чулуу	'stone'	uuču	уужуу	'wide'
tuoui	дугуй	'circle'	uuřčeŋgui	урлангуй	'angry'
curga	зургаа	'six'	puuxča	буухиа	'courier'
c <sup>h</sup> örxai	цурхай	'pike'	t <sup>h</sup> uužai	туулай	'hare'
uiwsx <sup>h</sup> i	уйвсхий	'be unsteady'			
cuigub	зийгуул	'wild'			
xuixoi	хийхүй	'Chinese Muslim' (Ch)			
xuilaža	хийлаа	'roll'			
uiłxai	уйлхай	'weepy'			
nar <sup>h</sup> iŋ	нарийн	'thin'	jaačg <sup>h</sup> i	яажгий	'rickety' (Ch)
atu	адуу	'horse'	aaruž	ааруул	'dried curds'
wantoi	вандуй	'pea' (Ch)			
jama	ямаа	'goat'	čaača	жаажаа	'auntie' (Ch)
xantgai	хандгай	'elk'	paawgai	баавгай	'bear'
maičg <sup>h</sup> i	майжгий	'down at heel'	moin <sup>h</sup> i	мойний	'to get knotty'
xairu	хайруу	'hard'	č̥oiltu	цойлдуу	'isolated'
aisui	айсүй	'coming'			
paic <sup>h</sup> a	байцаа	'cabbage' (Ch)	poits	бойдоо	'clumsy'
paimgai	баймгай	'full-sized'			
ɔğli	олий	'to squint'			
xočuž	хожуул	'stump'	č̥očt <sup>h</sup> u	жоотуу	'pick'
sənsxoi	соңсохүй	'hearing'	təoččeŋgui	дооглонгуй	'mocking'
təččo	долоо	'seven'	təoččo	доожкоо	'appearance'
noxoi	нохой	'dog'	χooččoi	хоолой	'throat'

Note: Whenever possible, monomorphemic words are used as examples. No examples were found for some of the theoretically possible combinations, and some could be exemplified only with Chinese or Tibetan loan-words.

(11)	(a) ACC–RFL /-ig–E/	(b) RFL /-E/
	piir–ig–e	бийрийгээ
	suuł–ig–e	сүүлийгээ
	teeł–ig–e	дээлийгээ
	poor–ig–o	бөөрийгөө
	muur–ig–a	муурыгаа
	cʰaas–ig–a	цаасыгаа
	xɔɔł–ig–ɔ	хоолыгоо
	piir–e	бийрээ
	suuł–e	сүүлээ
	teeł–e	дээлээ
	poor–o	бөөрөө
	muur–a	муураа
	cʰaas–a	цаасаа
	xɔɔł–ɔ	хоолоо

The fact that *i*-diphthongs function in the same way as the corresponding basic vowel in vowel harmony, can be regarded as a special case of the fact that any non-initial *i* is ignored by vowel harmony, since *i*-diphthongs are represented as sequences of two vowels (see (6) above).

There are rather few monomorphemic pharyngeal words with *i* as the vowel of the second syllable. Many of these are ‘expressive’ verbs, intransitive verbs which describe how something looks or sounds (12). It is possible that *i* should be regarded as a suffix in these words, although with a very vague meaning. There are also a few other words of this type, such as *nar'iŋ* нарийн ‘thin’. These words take suffix vowels whose vowel harmony class depends on the first vowel, and the *i* is ignored. This is exemplified with the direct past in (12).

(12)	verb	direct past
	tʰax̚i	тахий
	jaŋx̚i	янхий
	guwč̚i	гувчий
	ɔk̚i	олий
	tʰax̚i–łza	тахийлаа
	jaŋx̚i–łza	янхийлаа
	guwč̚i–łza	гувчийлаа
	ɔk̚i–łɔ	олийлоо

The *i* in these words (written ий in Cyrillic Mongolian) is always preceded by a palatalized or alveopalatal consonant (i.e. one with the feature [palatal], see (5) above). This appears to be the only case where an *i* palatalizes a preceding consonant in modern Halk Mongolian, all other applications of such rules being historical, since the relevant environments have been eliminated by other phonological rules (see 10.5 and 10.7). Non-palatalizing *i* (ы in Cyrillic Mongolian) occurs only in inflectional suffixes (accusative *-ig*, genitive *-iŋ*, *-ni*, and the optative (see 6.5)). This seems to be the only phonological property that makes a difference between inflectional and derivational suffixes in Halk (see 8.8 for a similar case in Old Mongolian).

### 5.2.2 Opaque vowels

The non-open vowel /U/ (*u* or *ø*) is opaque in the sense that it blocks rounding harmony, and following open vowels must be unrounded. For instance, when the direct past *-łE* is added after the causative *-Uł*, *E* is realized as an unrounded vowel (*e* or *a*), irrespective of whether the stem has rounded vowels or not (13).

Examples where the direct past is added directly to the stem are given for comparison.

(13) CAUS–DPST /-Uʒ–ʒE/	DPST /-ʒE/
it–uʒ–ʒe идүүлээ	it–ʒe идлээ ‘to eat’
uc–uʒ–ʒe үзүүлээ	uc–ʒe үзлээ ‘to see’
xeeʒ–uʒ–ʒe хээлүүлээ	xeeʒ–ʒe хээлээ ‘to decorate’
og–uʒ–ʒe огүүлээ	og–ʒo оглоө ‘to give’
xun <sup>j</sup> –uʒ–ʒa хуниуллаа	xun <sup>j</sup> –ʒa хуньлаа ‘to pleat’
jaw–uʒ–ʒa явууллаа	jaw–ʒa явлаа ‘to go’
ɔr–uʒ–ʒa орууллаа	ɔr–ʒɔ орлоо ‘to enter’

When *Ei* is realized as *e*, it blocks rounding harmony, as seen in (14), where comitative  $-t^h Ei$  is combined with reflexive *-E* (an epenthetic consonant *g/G* is inserted if the stem ends in a vowel (see 5.2.5)). A crucial example is *poor-t<sup>h</sup>e–ge* бөөртэйгээ ‘kidney–COM–RFL’, where the realization of the last vowel is unrounded *e*, as in the comitative suffix, and not rounded *o*, as in the root. The spelling norm, as represented by the orthographic dictionary by Damdinsürèn and Osor (1983), prescribes forms with a rounded open vowel in these words (бөөртэйгөө *poortego*, etc.), but such forms are not common in colloquial Ulaanbaatar speech. Similarly, words like *xoonte* хөөндэй ‘thrush’, with the phonological representation /xoon-tEi/, usually take the unrounded forms of open suffix vowels, for example, reflexive /xoontEi–E/ *xoontegē* хөөндэйгээ.

(14) COM–RFL /-t <sup>h</sup> Ei–E/	RFL /-E/
piir–t <sup>h</sup> e–ge бийртэйгээ	piir–e бийрээ ‘brush’
suuʒ–t <sup>h</sup> e–ge сүүлтэйгээ	suuʒ–e сүүлээ ‘tail’
teeʒ–t <sup>h</sup> e–ge дээлтэйгээ	teeʒ–e дээлээ ‘gown’
poor–t <sup>h</sup> e–ge бөөртэйгээ	poor–o бөөрөө ‘kidney’
muur–t <sup>h</sup> ai–ga мууртайгаа	muur–a муураа ‘cat’
chaaʒ–t <sup>h</sup> ai–ga цаастайгаа	chaaʒ–a цаасаа ‘paper’
χəɔʒ–t <sup>h</sup> ɔi–go χоолтойгоо	χəɔʒ–ɔ χоолоо ‘food’

In the spoken language of Ulaanbaatar, *i* may block rounding harmony. This is more common for *o* than for *ɔ*. There is some variation, and the pronunciation seems to depend on the distance between the initial rounded vowel and the harmonizing one. In words like /jorŋxiʒgčh–E/ ‘president–RFL’, the most common pronunciation is *jorŋxiʒgčhē* and not *jorŋxiʒgčhō*, although the normative spelling is ерөнхийлогчоо. In forms like /poor–ig–E/ ‘kidney–ACC–RFL’, spelled бөөрийгөө, there is variation between *poorige* and *poorigo*. Some words, like /oor–ig–E/ өөрийгөө ‘self–ACC–RFL’, are usually pronounced with *o* (*oorigo*). This needs to be investigated more, and for the time being we will use the normative forms with rounded vowels in our analysis. Since there is no contrast between rounded and unrounded vowels in this environment, some variation is perhaps to be expected.

### 5.2.3 *The domain of vowel harmony*<sup>2</sup>

The phonological domain of vowel harmony is the non-compound word, and the constituents of compounds are treated as separate words from the point of view of vowel harmony. Thus, suffix vowels always harmonize with the last element of a compound, for example, with *cui* зүй in *aw<sup>j</sup>a=cui* авиаазүй ‘phonetics’ (*aw<sup>j</sup>a* ‘sound’, *cui* ‘-ology’), and with *mɔr<sup>j</sup>* морь in *xii=mɔr<sup>j</sup>* хийморь ‘good luck’ (*xii* ‘air’, *mɔr<sup>j</sup>* ‘horse’). For example, the reflexives of these two words are *aw<sup>j</sup>a=cui-ge* авиаазүйгээ and *xii=mɔr<sup>j</sup>-č* хийморио, respectively.

In a noun phrase, case and reflexive suffixes are invariably added to the last element of the phrase, and there is no agreement within the noun phrase. The suffix follows harmonizing features of the word it is attached to, irrespective of its syntactic role in the noun phrase:

(15)	eeč–es mother–ABL	ээжээс	‘from mother’
	aaw–as father–ABL	ааваас	‘from father’
	eeč aaw–as mother father–ABL	ээж ааваас	‘from mother and father’
	aaw eeč–es father mother–ABL	аав ээжээс	‘from father and mother’
	eeč aaw xɔjr–cs mother father two–ABL	ээж аав хоёроос	‘from mother and father’
	aaw pur–es father each–ABL	аав бүрээс	‘from each father’

The negation *–gui* and the indirect past tense suffix *–če/čʰe* have no vowel alternation (16), and thus do not conform to the vowel harmony rules (the alternation between č and čʰ in the indirect past is partly phonologically, partly lexically determined). It can be noted that unlike other verb suffixes, these two were written as separate words in Classical Mongolian, *ügei* and *juquiljüküi*.

(16)	verb stem	negated imperfect participle	indirect past
	it	ит	ит–če
	uc	үз	үс–če
	xeež	хээл	хееž–če
	og	өг	ог–če
	xon <sup>j</sup>	хунь	хон <sup>j</sup> –če
	jaw	яв	jaw–če
	ɔr	ор	ɔr–če
		it–e–gui	идээгүй
		uc–e–gui	үзээгүй
		xeež–e–gui	хээлээгүй
		og–o–gui	өгөөгүй
		xon <sup>j</sup> –a–gui	хуниагүй
		jaw–a–gui	яваагүй
		ɔr–ɔ–gui	ороогүй
			иджээ
			үзжээ
			хээлжээ
			өгчээ
			хуньжээ
			явжээ
			оржээ
			‘to eat’
			‘to see’
			‘to decorate’
			‘to give’
			‘to pleat’
			‘to go’
			‘to enter’

The indirect past cannot be followed by other suffixes. When another suffix is added after *–gui*, it takes non-pharyngeal vowels even if the stem has pharyngeal

<sup>2</sup> Mikami (1987); Ichinose (1992a).

vowels, for example, *ačəž-gui-čʰut* [work-NEGATION-PL] ажилгүйчүүд ‘the unemployed (PL)’; *tʰagŋai-š-ʊž-təg-gui-ger-e* [palate-VR-CAUS-HABITUAL-NEGATION-INST-RFL] тагнайштуулдагтүйэрээ ‘since [it] is usually not palatalized’ (from Luvsanvandan 1975c: 12).

A verb-forming suffix *-xi*, identical with the verb *xii* хий ‘to do’, is found in a number of verbs, exemplified in (17). These verbs take suffixes whose vowels harmonize with the *i*, unlike the verbs in (12).

(17) verb		direct past		
amsxii	амсхий	amsxi-že	амсхийлээ	‘to take a rest’
gɔtxii	годхий	gɔtxi-že	годхийлээ	‘to pop out’
jarxi	ярхий	jarxi-že	ярхийлээ	‘to bang’
tugxi	дугхий	tugxi-že	дугхийлээ	‘to take a nap’

If the domain of vowel harmony is taken to be the non-compound word, the suffixes *-xi*, *-če* and *-gui* function as compound-forming elements (=*xii*, =*če*, =*gui*) rather than derivational or inflectional suffixes. This is partly supported by the prosodic behaviour of the negation =*gui*, which, unlike suffixes, can take the rising tone signalling focal accent (see 7.3).

#### 5.2.4 Vowel harmony as feature spreading

The standard analysis of vowel harmony is autosegmental spreading of the relevant feature over a domain (see e.g. van der Hulst and van de Weijer (1995)). In Mongolian, the domain is the non-compound word, and the spreading features are [pharyngeal] and [round]. Since Mongolian is exclusively suffixing, and a root determines the vowel harmony class of its suffixes, the direction of spreading is from left to right.

We assume that the initial vowel of a word is specified as in (7) above. The vowels that occur in the phonemic representation of non-initial syllables, /i, U, E/, have the feature specifications [] (zero), [round], and [open], respectively. For the two archiphonemes, these are the features which are common to the vowels in the respective alternation class {u, ʊ} and {e, a, o, ɔ}. The vowel /i/ is not changed by vowel harmony, /U/ gets its value for the feature [pharyngeal] from vowel harmony, and /E/ gets the values for both [pharyngeal] and [round]:

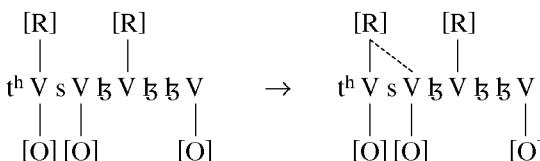
#### (18) Realizations of non-initial vowels

vowel and feature specification	realization in			
	non-pharyngeal words		pharyngeal words	
	unrounded	rounded	unrounded	rounded
E [O]	[O] e	[OR] o	[OF] a	[ORF] ɔ
U [R]	[R] u		[RF] ʊ	
i []	[] i			

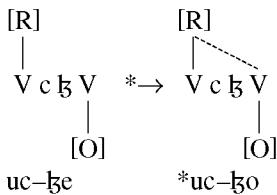
Using this analysis, pharyngeal harmony can be regarded as spreading of the feature [pharyngeal] from the first vowel throughout the word. If the initial vowel does not have this feature, no spreading takes place. The set of target segments to which pharyngeal vowel harmony spreads consists of all vowels except *i*, which, as seen in section 5.2.1, is transparent and unaffected by vowel harmony. According to the analysis of van der Hulst and van de Weijer (1995: 508), the target segments are those segments which have a V-place node. The absence of place features in the representation of *i* indicates that it does not have any place node, so that vowel harmony cannot spread to it (or spread from initial *i*).

Rounding harmony can similarly be analysed as spreading of the feature [round], but the target segments are only the open vowels, and the non-open rounded vowel *U* blocks rounding harmony. One possible explanation for this is that the feature [round] spreads from an initial open rounded vowel, and the spreading is stopped by a vowel which is inherently associated to the feature [round] due to the general constraint in autosegmental phonology that association lines cannot cross (19a). It is, however, difficult to explain why the feature [round] does not spread from an initial non-open rounded vowel (*u* or *v*) except by an ad hoc rule (see (19b)).

- (19) (a) *t<sup>h</sup>osolɔ̄-uł̄-ł̄e төсөөлүүллээ* ‘to imagine–CAUS–DPST’



- (b) *uc-ł̄e үзлээ* ‘to see–DPST’



If one of the features [pharyngeal] or [round] is spread in a word, it is always present in the initial vowel. This suggests that these features are associated to the initial vowel in the phonological representation of root morphemes as in (20a), and not associated only with the morpheme as in (20b). The representation in (a), but not the one in (b), excludes pharyngeal words with initial *i*. See section 10.6.2 for a comparison with Old Mongolian vowel harmony, where \**i* can occur initially in both front- and back-vocalic words.

- (20) (a) [F]  
       |  
       V1 V2 V3 ...      \*[F]  
                         |  
                         i V2 V3 ...
- (b) {[F]  
       V1 V2 V3 ... }      {[F]  
                         i V2 V3 ... }

### 5.2.5 Velar ~ uvular alternation and epenthetic consonants<sup>3</sup>

As mentioned earlier, velars and uvulars alternate, so that the uvulars [n, χ, g] occur only in pharyngeal words, and the velars [ŋ, x, g] only in non-pharyngeal words. The only exception is g, which may occur in morpheme-final position in pharyngeal words and may contrast with g (see 3.2.2).

When a suffix beginning with a vowel is added to a stem ending in a vowel, an epenthetic consonant is added to avoid hiatus. This consonant is g in non-pharyngeal and ɣ in pharyngeal words. When it occurs before i, however, it is ɣ in pharyngeal words as well, even though the combination gi is possible, as seen in section 3.2.2. Examples are given in (21a), with examples of consonant-final stems (21b) for comparison.

- |                |         |           |                |
|----------------|---------|-----------|----------------|
| (21) (a) /xuu/ | xuu     | xYY       | 'boy'          |
| /xuu-Er/       | xuuger  | хүүгээр   | 'boy-INST'     |
| /xuu-ɪŋ/       | xuugiŋ  | хүүгийн   | 'boy-GEN'      |
| /sana/         | sana    | санаа     | 'thought'      |
| /sana-Er/      | sanagar | санаагаар | 'thought-INST' |
| /sana-ɪŋ/      | sanagin | санаагийн | 'thought-GEN'  |
| (b) /ar/       | ar      | ap        | 'back'         |
| /ar-Er/        | arar    | араар     | 'back-INST'    |
| /ar-ɪŋ/        | ariŋ    | арын      | 'back-GEN'     |

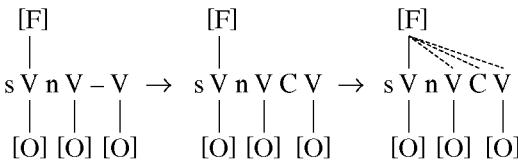
In the place feature analysis given in (5), velars have the specification [velar] and uvulars [velar, pharyngeal]. The feature [velar] is redundant for the Halkh vowels, and it is possible to specify the consonants as well without referring to it, so that velars are unmarked consonants without any place feature, and uvulars are specified as [pharyngeal]. If consonant epenthesis consists of the addition of a consonant without place features, the velar appears under this analysis, and it becomes uvular by the spreading of [pharyngeal] in pharyngeal words (22).

- (22) (a) /unE-E/ une-ge үнээгээ 'cow-RFL'

Vn	V-V	→	Vn	VCV
[R]	[O][O]		[R]	[O][O]

<sup>3</sup> Kotwicz (1936); Ramstedt (1957: 170ff.); Rialland and Djamouri (1984).

- (b) /sanE–E/ sana–ga санаараа ‘thought–RFL’



### 5.2.6 Cyclic vowel harmony

In section 5.2.4 we gave the vowel harmony rules as if the harmonizing features spread to the target segments of a word in one application of autosegmental spreading after all suffixes have been added, so that vowel harmony is postcyclic or even postlexical in the terminology of lexical phonology (see e.g. Cole 1995).

There is, however, evidence that Mongolian vowel harmony is cyclic, so that vowel harmony spreading must take place after each addition of a suffix. The reason for this is the segmental rule that converts *ei* and *oi* to *e*, but preserves *ai* and *ɔi*; or in an alternative formulation, realizes /Ei/ as *e/ei/ɔi* depending on vowel harmony; see (9) above.

First, rounding harmony does not spread through /Ei/ when it is realized as *e* (23a), but it spreads through its realization *ɔi* (23b):

- (23) (a) /mor-t<sup>h</sup>Ei–E/ mort<sup>h</sup>ege мөртэйгээ ‘way–COM–RFL’  
          /xoontEi–E/ xoontege хөөндэйгээ ‘thrush–RFL’  
      (b) /ɔr-t<sup>h</sup>Ei–E/ ɔrt<sup>h</sup>ɔiго ортойгоо ‘place–COM–RFL’  
      /nɔxEi–E/ nɔxɔiго нохойгоо ‘dog–RFL’

If rounding harmony were to apply after all morphological operations, the result would be incorrect for words like those in (23a), but correct for those in (23b); *G* denotes the alternation *g ~ ɔ* in suffixes.

- (24) (a) representation mor–t<sup>h</sup>Ei–E  
          consonant epenthesis mor–t<sup>h</sup>Ei–GE  
          spreading of [R] mor–t<sup>h</sup>oi–Go  
          segmental rules \*mor–t<sup>h</sup>e–go  
      (b) representation ɔr–t<sup>h</sup>Ei–E  
          consonant epenthesis ɔr–t<sup>h</sup>Ei–GE  
          spreading of [FR] ɔr–t<sup>h</sup>ɔi–go

Instead, cyclic application of rounding harmony is necessary in order to explain why /Ei/ blocks rounding harmony when it is realized as *e* (25).

- (25) stem mor  
      Cycle 1: COM mor–t<sup>h</sup>Ei  
          spreading of [R] mor–t<sup>h</sup>oi  
          segmental rule mor–t<sup>h</sup>e

<i>Cycle 2: RFL</i>	<i>morth<sup>e</sup>-E</i>
consonant epenthesis	<i>morth<sup>e</sup>-GE</i>
no spreading	<i>morth<sup>e</sup>-ge</i>

The realization of /Ei/ as *e* is dependent on the fact that [pharyngeal] has not spread to /Ei/, since the pharyngeal realizations of /Ei/ are *ai* and *ɔi*. Pharyngeal harmony spreading must thus precede the /Ei/ realization rule, and this proves that not only rounding harmony, but also pharyngeal harmony, is cyclic.

Vowel epenthesis (Chapter 6) is independent of vowel harmony, and schwa vowels in non-initial syllables are transparent to vowel harmony (as was pointed out by Saitô 1984):

- (26) /aw-sŋ-t-E/ [aws̥ánta] авсандаа ‘to take—PSTP—DAT—RFL’  
       /aw-čʰx-ł̥E/ [awčʰixł̥a] авчихлаа ‘to take—INTENSIVE—DPST’  
       /sur-sŋ-t-E/ [surs̥ánta] сурсандаа ‘to study—PSTP—DAT—RFL’  
       /sur-čʰx-ł̥E/ [surčʰixł̥a] сурчихлаа ‘to study—INTENSIVE—DPST’

As seen in sections 1.1 and 3.1.1, the quality of epenthetic vowels is determined by a rule which depends on the preceding vowel (or consonant, if it is palatal). It will be shown in Chapter 6 that the rule governing the insertion of epenthetic vowels is cyclic, like vowel harmony. The fact that the epenthetic vowels are transparent to vowel harmony can be explained by ordering the epenthesis rule after the vowel harmony rule. The rule which determines the quality of epenthetic vowels can be regarded as postcyclic.

### 5.3 VELAR NASAL ASSIMILATION

When a suffix beginning with a dental consonant (e.g. comitative  $-t^hEi$ , dative  $-t/ t^h$ , plural  $-s$ , or the adjectivizing suffix  $-t^h$ ) is added to a word ending in the velar nasal  $\eta$ , this consonant is assimilated to the dental and becomes  $n$ :

- | (27)    |        | <i>comitative</i> |           | <i>dative</i> |
|---------|--------|-------------------|-----------|---------------|
| xaan̥   | хаан   | 'Khan'            | xaantʰai  | хаантай       |
| xuŋ     | хүн    | 'person'          | xuntʰe    | хүнтэй        |
| xuuχən̥ | хүүхэн | 'girl'            | xuuχəntʰe | хүүхэнтэй     |

When a suffix beginning with a vowel is added to a word ending in *ŋ*, it also changes to *n* (28). This is a consequence of the fact that the velar nasal never occurs in syllable onsets.

- |                 |          |          |                      |         |             |
|-----------------|----------|----------|----------------------|---------|-------------|
| (28) xaaŋ       | xaan     | 'Khan'   | <i>instrumental:</i> | xaanar  | xaanaap     |
| xuŋ             | xuŋ      | 'person' |                      | xuner   | xuŋeer      |
| xuuŋ <i>qeq</i> | xuuŋxuuŋ | 'girl'   |                      | xuuŋner | xuuŋxuuŋner |

This also changes the pronunciation of the vowel: it is heavily nasalized before *y*, which is often realized only by this nasalization; but *n* remains consonantal and the preceding vowel is only slightly nasalized (see 2.3).

## 5.4 REDUPLICATION

There are two reduplication processes in Mongolian which interact with the phonology, one which applies to adjectives and one to nouns. They are described here because of their interest as providing arguments for the phonological analysis. This section is based on Svantesson (1997); the same kind of analysis has been made by Mikami (1983), Kubo (1997), and Song Chae-mok (1999b).

### 5.4.1 Adjective reduplication

This kind of reduplication is used for intensifying some adjectives. In Halkh it is applied only to some twenty or thirty adjectives. Examples are given in (29).

(29) *Examples of adjective reduplication*

word			reduplicated form	
(a)	xar	хар	'black'	xaw xar      хав хар
	xox	хөх	'blue'	xow xox      хөв хөх
	нөгөө	ногоон	'green'	нɔw нөгөө      нов ногоон
(b)	үзән	улаан	'red'	uw үзән      ув улаан
	илхөн	илхэн	'clear'	iw ilxөn      ив илхэн
(c)	поорөнхий	бөөрөнхий	'round'	pow поорөнхий      бөв бөөрөнхий
	xuitʰөн	хүйтэн	'cold'	xuw xuitʰөн      хүв хүйтэн

The most common case is that a reduplicative prefix is formed by adding the coda *w* to the initial CV combination (29a). If the base begins with a vowel, only this vowel and *w* is prefixed (29b).

This can be analysed in the framework of non-concatenative morphology (see e.g. Marantz 1982) by assuming that a CVC prefix is added, where the last C is prespecified as *w*. The segments of the base are copied and associated to the unassociated segment slots of the prefix. Unassociated segments are deleted by ‘stray erasure’:

(30) (a)	n   ɔ   g   ɔ   η	n   ɔ   g   ɔ   η	(b)	u   ɔ   ɔ   a   η	u   ɔ   ɔ   a   η
	C V C	— C V C V C		C V C	— V C V C
	w			w	
	nɔw-nɔgɔη			uw-ɔzən	

These derivations are straightforward assuming that the association goes from left to right and is ‘segment-driven’, so that it starts with the leftmost segment finding a suitable slot, and then continues with the next segment, until the slots (or the segments) are exhausted. Left-to-right, segment-driven reduplication is regarded as the default case by Marantz (1982: 447). Nevertheless, this type of reduplication has something to tell about the representation of long vowels and diphthongs in Mongolian. The examples in (29c) show that vowel length does not transfer to

the reduplicative prefix, and that only the first element of a diphthong is transferred. Thus, long vowels and diphthongs are not treated as units, but as segment sequences, so reduplication supports the representation of long vowels and diphthongs assumed in (6). The derivations are shown in (31):

(31) (a)	$\begin{array}{c} p \quad o \quad r \quad \eta \quad x \quad i \\   \quad   \quad   \quad   \quad   \quad   \\ C \quad V \quad C \quad - \quad C \quad V \quad C \quad C \quad C \quad V \\   \\ w \end{array}$	$\begin{array}{c} p \quad o \quad r \quad \eta \quad x \quad i \\   \quad   \quad   \quad   \quad   \quad   \\ C \quad V \quad C \quad C \quad C \quad V \\   \\ w \end{array}$	(b)	$\begin{array}{c} x \quad u \quad i \quad t^h \quad \eta \\   \quad   \quad   \quad   \quad   \\ C \quad V \quad C \quad - \quad C \quad V \quad V \quad C \quad C \\   \\ w \end{array}$
----------	---	---	-----	---

In Eastern Mongolian dialects, including Horchin (9.1), the *i*-diphthongs have developed to monophthongs. In Horchin, the word ‘cold’ is [xyy<sup>h</sup>ən], which is reduplicated as [xyp xyy<sup>h</sup>ən] (Coyijongjab p.c. June 1998). This indicates that the vowel corresponding to Halh *ui* must be represented as *yy* even at the phonological level in this dialect. According to Mönggöngörerel (1998: 85), adjective reduplication in the Naiman dialect of Mongolian transfers vowel length: *xiit<sup>h</sup>ən* ‘cold’ reduplicates as *xiip xiit<sup>h</sup>ən*.

#### 5.4.2 Noun reduplication

This kind of reduplication, which is phonologically more interesting, can be applied to any noun (including proper names and nominal forms of verbs). It has a meaning like ‘X and such things’, ‘X and people like him/her’ and is slightly pejorative or at least shows an indifferent or disrespectful attitude. Examples are given in Table 5.3. Similar reduplication processes are common in other Central and West Asiatic languages.

Some lexicalized reduplications are used for certain words, but noun reduplication is usually formed regularly by reduplicating the entire word, changing the initial consonant to *m* and attaching it to the base as a suffix (Table 5.3a). If there is no initial consonant, the *m* is just added (b), and if the initial consonant is *m*, it is changed to *c* (c). The affricates *c<sup>h</sup>*, *č<sup>h</sup>*, *c*, *č* and the voiceless lateral *t* are reduplicated as if they were single consonants (d), indicating that this analysis, which was assumed in Chapter 3, is the correct one.

Reduplication is also relevant for the problem how to analyse the initial combinations [xua] ~ [xwa] and [gua] ~ [gwa] which occur in a number of Chinese loans (see 3.1 above). If initial clusters (*xw-*, *gw-*) are ruled out, there are two possibilities, either to assume labialized consonants *xʷ*, *gʷ*, or to assume a diphthong *ua*, which does not occur otherwise in the language. In the reduplication, only *x* and *g* are changed (Table 5.3e), indicating that the diphthong analysis should be chosen, as was done in section 3.1. It can be noted that the combination of initial *m* and the diphthong *ua* does not occur elsewhere in the language.

Interesting facts are provided by the interaction of noun reduplication and consonant palatalization. Since palatalized consonants are analysed as unitary segments, one might expect that they are changed to *m* in reduplication. This is, however, not

the case: the initial consonant of the reduplicative prefix is palatalized  $m^j$ , not plain  $m$  (Table 5.3f). This raises the question of whether palatalized consonants should be represented as sequences of plain consonants and  $i$ , so that for instance the word ‘baby’ should be represented as *niaʒx* rather than *n̥iaʒx*. A representation with  $i$  is undesirable, since it is necessary to recognize the existence of palatalized consonant phonemes (3.2.1), and furthermore, this representation would introduce several  $i$ -initial diphthongs not found elsewhere in the language. Reduplication itself provides another argument, since words beginning with palatalized  $m^j$  reduplicate with the initial consonant  $c$  not followed by any  $i$  element (Table 5.3g). There is no palatalized counterpart to the dental affricate  $c$ , so a reduplication pattern like \**m̥iaŋG c̥iaŋG* is impossible, and this blocks palatalization from being transferred to the reduplicative suffix. On the other hand, if the diphthong analysis were adopted, nothing except an ad hoc rule would prevent non-existing reduplication patterns such as \**m̥iaŋG c̥iaŋG*.

TABLE 5.3 Examples of noun reduplication

<i>word</i>		<i>reduplicated form</i>			
(a)	tʰaʒx teeʒ goiməŋ nut	тах дээл гоймон нүд	‘bread’ ‘gown’ ‘noodles’ ‘eye’	tʰaʒx maʒx teeʒ meeʒ goiməŋ təiməŋ nut mut	тах малх дээл мээл гоймон моймон нүд мүд
(b)	ar ontəg	ар өндөг	‘back’ ‘egg’	ar mar ontəg montəg	ар мар өндөг мөндөг
(c)	maʒ miʒxi	мал мэлхий	‘cattle’ ‘frog’	maʒ caʒ miʒxi ciʒxi	мал зал мэлхий зэлхий
(d)	c̥hai čʰuʃu cam čiʒ ħagw	цай чулуу зам жил ħagw	‘tea’ ‘stone’ ‘road’ ‘year’ ‘Wednesday’	c̥hai mai čʰuʃu muʃu cam mam čiʒ miʒ ħagw magw	цай май чулуу мулуу зам мам жил милиц лхагва магва
(e)	guanc xuar	гуанз хуар	‘restaurant’ ‘flower’	guanc muanc xuar muar	гуанз муанз хуар муар
(f)	p̥asʃəg n̥iʒx χ̥aam	бяслаг илях хиам	‘cheese’ ‘baby’ ‘sausage’	p̥asʃəg m̥asʃəg n̥iʒx m̥iʒx χ̥aam m̥aam	бяслаг мяслаг илях мялх хиам миам
(g)	m̥agmər m̥aŋg	мягмар мянга	‘Tuesday’ ‘thousand’	m̥agmər caqmər m̥aŋg caŋg	мягмар загмар мянга занга
(h)	jʊŋgər jɔr jir jeewəŋ juutəŋ jos	юнгар ёр ер еэвэн юудэн ес	‘mustard’ ‘omen’ ‘ninety’ ‘mooncake’ ‘hood’ ‘nine’	jʊŋgər tʊŋgər jɔr mor jir mir jeewəŋ meewəŋ juutəŋ muutəŋ jos mos	юнгар мунгар ёр мор ер мэр еэвэн мээвэн юудэн мүүдэн ес мөс
(i)	jas jaʒa	яс ялаа	‘bone’ ‘fly’	jas m̥ias jaʒa m̥aʒa	яс мяс ялаа мялаа

A final problem is the reduplication of words with initial *j*. The expected pattern would be that *m* is substituted for *j* in the reduplicative suffix. This is in fact the case (Table 5.3h), except when the vowel following *j* is *a*. In that case, palatalized *m<sup>j</sup>* occurs (i). This can be partially explained by the distribution of palatalized consonants, which do not occur in words with non-pharyngeal vowels (*i, e, u, o*). Thus a reduplication pattern like *\*jos m<sup>j</sup>os* is phonotactically impossible, but this does not rule out patterns like *\*jɔr m<sup>j</sup>ɔr* with a pharyngeal vowel. Although this case is difficult to explain, it can be noted that word-initial palatalized consonants occur almost exclusively before *a*. In those cases where the historical development can be expected to result in a palatalized consonant before *u* or *ɔ*, a plain consonant occurs instead, for instance in *nʊu hyy* ‘to hide’ (from Old Mongolian *\*nihu*) (see 10.11.1).

Mongolian reduplication also raises the question of which units are involved in reduplication processes. Adjective reduplication is a textbook example of a process that can be analysed with a CV template, but noun reduplication requires other units. On the one hand, the entire word is reduplicated, but on the other, the process needs access to the internal structure of palatalized consonants in order to produce the reduplication patterns for palatalized consonants. This suggests that it is necessary to represent palatalization on a separate tier in the phonology.

## SYLLABIFICATION AND EPENTHESIS

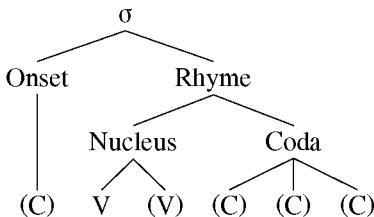
This chapter deals with the formation of surface syllables, which is closely connected with epenthesis. Syllables are surface phenomena, and an epenthetic vowel is a syllable nucleus although it does not occur in phonological representations. Thus, in this chapter the term ‘vowel’ (the symbol V) refers both to phonemic and epenthetic (non-phonemic) vowels. A dot (.) denotes syllable boundary. The chapter is based mainly on Svantesson (1988a; 1994; 1995a).

The description of vowel epenthesis and syllabification is based on careful lexical pronunciation of words said in isolation. When a word occurs in a sentence, or when the speech tempo is faster, epenthetic and sometimes even phonemic vowels may disappear depending on the speech rhythm, and there is some individual variation between speakers as well. This remains to be investigated, however. Occasional examples of this variation can be seen in the speech material analysed in Chapter 7 and elsewhere.

### 6.1 SYLLABLE STRUCTURE<sup>1</sup>

Mongolian surface syllables have the structure (C)V(V)(C)(C)(C). The syllable will be regarded as consisting of an onset (the initial consonant) and a rhyme, which in its turn consists of a vowel nucleus and a coda (the final consonants). The onset and coda may be absent. The marginal triphthong *vai* is disregarded in this chapter.

(1) *Mongolian surface syllable structure*



<sup>1</sup> Sühbaatar (1973); Bajčura (1974); Jôo (1976a); Shimizu (1980); Dobo (1982); Ebeltü (1992); Svantesson (1994); Xiao (1995); Kökebars (1996); Köke (1998b); Bernhardt (1999); Song Chae-mok (1999a).

We will assume that words are divided into syllables in such a way that a consonant which is followed by a vowel is an onset, and does not belong to a coda, for example, *sa.na* санаа ‘thought’, *xaʃ.xa* халхaa ‘shield–RFL’ (not \**san.a*, \**xaʃx.a*). This kind of syllable division is regarded as uncontroversial in the phonological (but not in the phonetic) literature (see e.g. Clements and Keyser 1983: 37). For Mongolian, a rule that divides syllables in this way is given explicitly by Todaeva (1951: 39–40), and can also be inferred from examples given in works by other native Mongolian scholars, such as Sanžeev (1959: 18) and Cenggeltei (1979a: 149). This syllable division is also supported by the fact that the only consonant strings that can occur between vowels in surface forms are those that consist of a possible word-final surface consonant cluster plus one consonant which may occur word-initially.

Due to the agglutinative nature of the language, a word-final coda cluster can usually be made word-medial by adding a suitable syllable-forming suffix, for example, comitative case *-tʰEi* (i.e. *-tʰail/tʰɔil/tʰe*) for nouns or adjectives, or indirect past tense *-ʃE* (*-ʃa/ʃɔ/ʃe/ʃo*) for verbs. For instance, the word-final coda *ʃstʰ* in *iʃstʰ* элст ‘sandy’ becomes word-internal after the addition of the comitative suffix: *iʃstʰ.tʰe* элсттэй. For this reason, codas are normally exemplified in word-final position this chapter.

### 6.1.1 Syllable types

Table 6.1 shows those syllable types that can occur in different positions in a word, differentiated according to the number of consonants and vowels, and also according to the type of the vowel (short, long, *i*-diphthong, or epenthetic vowel). As seen in the table, any vowel type can combine with any permissible number of following tautosyllabic consonants (zero, one, two, or three).

The number of possible syllable types is largest in word-initial position, where long and short vowels contrast, and where syllables may or may not have an onset. Epenthetic vowels do not occur in initial syllables. A monosyllabic word can consist of any type of syllable that can be an initial syllable of a polysyllabic word, except that words of the type (C)V (where V is a short vowel) do not occur (see also 6.6).

Non-initial syllables always have an onset, and under the analysis adopted here, their nucleus may be a (short) phonemic vowel, a diphthong, or an epenthetic schwa vowel. The only difference between word-internal and word-final syllables is that an epenthetic vowel cannot occur in absolute word-final position.

Word-initial syllables may lack an onset, but onset-less syllables are not allowed inside words. If a suffix beginning with a vowel is added to a word ending in a vowel, an epenthetic consonant, *g* or *g* depending on the vowel harmony class, is inserted between them to avoid hiatus (see 5.2.5).

Any consonant may be a surface syllable onset, except *ŋ* (and the marginal phoneme *wj*). If *ŋ* becomes an onset as the result of a morphological operation, it is changed to *n* (see 5.3).

TABLE 6.1 Syllable types

(a) *Monosyllabic words*

CVV	guu	гүү	'mare'
VV	oo	оо	'powder'
CVi	xui	хүй	'group'
Vi	ai	ай	'category'
CVC	t <sup>h</sup> ɔt <sup>jh</sup>	тоть	'parrot'
VC	aj	ая	'melody'
CVVC	suuʒ	сүүл	'tail'
VVC	aaw	аав	'father'
CViC	cuiʒ	зүйл	'type'
ViC	aiʒ	айл	'family'
CVCC	taws	давс	'salt'
VCC	art	ард	'people'
CVVCC	nuurs	нүүрс	'coal'
VVCC	aałc	аалз	'spider'
CViCC	maiłs	майлс	'cypress'
ViCC	əims	оймс	'sock'
CVCCC	tawst <sup>h</sup>	давст	'salty' ('salt-AR')
VCCC	iłst <sup>h</sup>	элст	'sandy' ('sand-AR')
CVVCCC	nuursč <sup>h</sup>	нүүрсч	'coalman' ('coal-AGNR')
VVCCC	<i>no examples found – probably accidental gap</i>		
CViCCC	maiłst <sup>h</sup>	майлст	'cypress-AR'
ViCCC	əimst <sup>h</sup>	оймст	'sock-AR'

(b) *Word-initial*

CV	ja.ʒa	ялаа	'fly'
V	a.to	адуу	'horse'
CVV	t <sup>h</sup> uu.ʒai	туулай	'hare'
VV	aa.ruž	ааруул	'dried curds'
CVi	pai.ʃəŋ	байшин	'building'
Vi	ai.məg	аймаг	'district'
CVC	xon.ti	хөндий	'hollow'
VC	už.gər	үлгэр	'story'
CVVC	paaw.gai	баавгай	'bear'
VVC	uur.xai	урхай	'mine'
CViC	naiž.cur	найлзуур	'sprout'
ViC	aiž.t <sup>h</sup> ai	айлтай	'family-COM'
CVCC	xant.gai	хандтай	'elk'
VCC	ars.žəŋ	арслан	'lion'
CVVCC	gaans.t <sup>h</sup> ai	гаанстай	'pipe-COM'
VVCC	aałc.t <sup>h</sup> ai	аалттай	'spider-COM'
CViCC	maiłs.t <sup>h</sup> ai	майлтай	'cypress-COM'
ViCC	əims.t <sup>h</sup> oi	оймстой	'sock-COM'
CVCCC	tawst <sup>h</sup> .t <sup>h</sup> ai	давсттай	'salty-COM'
VCCC	iłst <sup>h</sup> .t <sup>h</sup> e	элттай	'sandy-COM'
CVVCCC	nuursč <sup>h</sup> .t <sup>h</sup> e	нүүрсчтай	'coalman-COM'
VVCCC	uurst <sup>h</sup> .ža	урстлаа	'to be angry-TERM-RFL' ('uurs-t <sup>h</sup> ž-a)

CViCCC	nɔɪrst <sup>h</sup> .kɔ	нойрстлоо	'to sleep-TERM-RFL' ( <i>nɔirs-t<sup>h</sup>kɔ-o</i> )
ViCCC	aimst <sup>h</sup> .kɔ	аймстлаа	'to be scared-TERM-RFL' ( <i>aims-t<sup>h</sup>kɔ-a</i> )

(c) *Word-internal*

CV	ja.kɔ.tʰai	ялаатай	'fly-COM'
CVi	tʰoo.kai.tʰai	туулайтай	'hare-COM'
Cə	ar.gə.kɔ	аргалаа	'dried dung-RFL'
CVC	aa.ruɔ̯.tʰai	ааруултай	'dried curds-COM'
CViC	xa.rais.nas	харайснаас	'to jump-PSTP-ABL' ( <i>xarai-sŋ-as</i> )
CəC	sar.məg.čʰəŋ	сармагчин	'monkey'
CVCC	sa.narx.səŋ	санаархсан	'to intend-PSTP' ( <i>sanarx-sŋ</i> )
CViCC	puc.gairx.səŋ	бузгайрхсан	'to be haughty-PSTP' ( <i>pucgairx-sŋ</i> )
CəCC	sur.wəžč.čəgčʰ	сурвалжлагч	'journalist'
CVCCC	sa.narx <sup>h</sup> .kɔ	санаархтлаа	'to intend-TERM-RFL'
CViCCC	puc.gairx <sup>h</sup> .kɔ	бузгайрхтлаа	'to be haughty-TERM-RFL'
CəCCC	nu.čjəmst <sup>h</sup> .tʰai	нулимсттай	'tearful-COM'

(d) *Word-final*

CV	ja.kɔ	ялаа	'fly'
CVi	tʰoo.kai	туулай	'hare'
CVC	šag.šor	шагшуур	'biscuit-stick'
CViC	xa.raix	харайх	'to jump-FUTP'
CəC	už.gər	үлгэр	'story'
CVCC	sa.narx	санаарх	'to intend'
CViCC	puc.gairx	бузгайрх	'to be haughty'
CəCC	gu.təmč	гудамж	'street'
CVCCC	mo.gorst <sup>h</sup>	мөгөөрст	'gristly' (gristle-AR)
CViCCC	<i>no examples found – probably accidental gap</i>		
CəCCC	nu.čjəmst <sup>h</sup>	нулимст	'tearful' (tear-AR)

Any single consonant except *p* and *p<sup>j</sup>* (and the marginal phonemes *p<sup>h</sup>, p<sup>jh</sup>, t*) can be a coda. The historical explanation for the exceptions is that Old Mongolian \**p* developed to *w* (or *w<sup>j</sup>* in palatalizing environments) when preceded by a vowel, for example, \**t<sup>h</sup>apun* > *t<sup>h</sup>aw* таб 'five'; \**t<sup>h</sup>apin* > *t<sup>h</sup>aw<sup>j</sup>* тавь 'fifty' (see 10.8.1).

6.1.2 *Codas, sonority, and epenthesis*<sup>2</sup>

Syllabification is closely related to vowel epenthesis in Mongolian, and we will show in this chapter that phonetically reduced non-initial vowels are inserted as part of the syllabification process, in order to create well-formed surface syllables. Thus they are epenthetic vowels which are absent from phonological representations. When the phonological representation of a word ends in two consonants, there are two possibilities for the surface form: it may have a two-consonant coda,

<sup>2</sup> Jalcib (1962); Sanžeev (1967); Kakudō (1974); Dobo (1982); Svantesson (1988a; 1994); Charette (1991–2); Denwood (1997a; 1998).

e.g. /art/ *art* apd ‘people’, or if the two consonants cannot form a coda, an epenthetic vowel is inserted between them, e.g. /paat<sup>h</sup>r/ *paat<sup>h</sup>ər* баатар ‘hero’. Whether or not a vowel is epenthesized depends only on the underlying consonant cluster, and there is no contrast between forms with and without epenthetic vowels. The only

TABLE 6.2 Two-consonant codas

	t <sup>h</sup>	t <sup>jh</sup>	č <sup>h</sup>	c <sup>h</sup>	p	p <sup>j</sup>	t	t <sup>j</sup>	č	c	š	s	x	x <sup>j</sup>	G	g	g <sup>j</sup>	m	m <sup>j</sup>	n	n <sup>j</sup>	ŋ	ł	ł <sup>j</sup>	r	r <sup>j</sup>	w	w <sup>j</sup>	j
t <sup>h</sup>	- o -	o o - o -	- -	o	- -	o	- -	o	- o -	- o -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
t <sup>jh</sup>	-	o o -																											o
č <sup>h</sup>	- o -	o o - o -																										- o o	- o o
c <sup>h</sup>	- o	o o - o -																										- o o	- o o
t	- o -	o o - o -																										- o o	- o o
t <sup>j</sup>	-	o o																										-	o
č	- o -	o o - o -																										- o o	- o o
c	- o	o o - o -																										- o o	- o o
š	+	- o o -	-																									-	o
s	+ o +	o o - o -																										- o o	- o o
x	+ o +	- o o - o -																										- o o	- o o
x <sup>j</sup>	+	- o o -																										-	o
G	+ o -	o o - o -																										- - - o	- o o
g	+ o + +	o o + o + +																										- o - o	- o o
g <sup>j</sup>		o o + +																										-	o
m	+ o + +	+ o + o +																										- o - o	- o o
m <sup>j</sup>	+ +	+	+																									-	o
n	+ o + +	o o + o + +																										- o - o	- o o
n <sup>j</sup>	+ + +	o o + + +																										-	o
ŋ	o o o o	o o o o o o o																										o o o o	o o o o
ł	+ o + +	+ o + o + +																										- o - o	- o o
ł <sup>j</sup>	+ + +	+ + +																										-	o
r	+ o + +	o o + o + +																										- o o	- o o
r <sup>j</sup>	+ + +	o o + + +																										-	o o
w	+ o + +	o o + o +																										- o - o	- o o
w <sup>j</sup>	+ + +	o o + +																										-	o o
j	+ o +	o o + o + +																										- o - o	- o o

The table shows which combinations can (+) and which cannot (-) form codas. Combinations marked 'o' do not occur in phonological representations (see (4) below), and empty positions denote combinations which have not been attested and are believed to be accidental gaps. The area below and to the left of the thick line contains those coda clusters which are predicted by the coda constraint (2).

exceptions are verbs with the future participle suffix *-x*, which have an epenthetic vowel even if the stem-final consonant and *x* may form a coda (see 6.4.1).

Table 6.2 shows which two-consonant combinations can form a coda and which cannot. All combinations of two final underlying consonants which we have encountered are exemplified in section 6.7.

Whether or not a consonant combination can form a syllable coda in Mongolian is essentially determined by a simple form of the well-known ‘sonority law’ saying that sonority is maximal at the syllable nucleus, and decreases towards the edges (an early formulation is Whitney 1866; see Clements 1990 for a recent survey and analysis). Combined with the assumption that voiced consonants are more sonorous than voiceless consonants, this accounts for most two-consonant codas in Mongolian, making the combination of a voiced+voiceless consonant a possible coda and causing other combinations to trigger vowel epenthesis (2).

### (2) *Coda constraint*

A string of two consonants is a possible coda if, and only if, it has decreasing sonority, that is, if it consists of a voiced consonant followed by a voiceless consonant.

The following exceptions obtain:

- (a) The clusters *ŋg*, *ŋg<sup>j</sup>*, *ŋG* are allowed as codas.
- (b) Clusters consisting of a fricative and an aspirated stop or affricate (except *c<sup>h</sup>*) form codas. The codas *št<sup>h</sup>*, *st<sup>h</sup>*, *sč<sup>h</sup>*, *xt<sup>h</sup>*, *xč<sup>h</sup>*, and *xj<sup>h</sup>* of this type have been attested.
- (c) The voiced stop *g* does not form a coda with voiceless obstruents, except *t<sup>h</sup>*.

In the clusters in (a), the place of articulation of the velar nasal is assimilated to the following obstruent, so that the actual pronunciation is [ŋg, ŋ<sup>j</sup>g<sup>j</sup>, NG]. These clusters can be regarded as forming partial geminates that cannot be split by epenthesis (Schein and Steriade 1986: 720), which may explain why they exist. Another possible explanation is the fact that the velar nasal never occurs as a syllable onset, which prevents it from being followed by an epenthetic vowel.

There are also some three-consonant codas, exemplified in (3) (see also Table 6.1). They consist of a voiced consonant followed by one of the coda-forming fricative–stop clusters (2b), and all encountered three-consonant combinations of this type form codas, except *gst<sup>h</sup>* and *gsc<sup>h</sup>* which trigger epenthesis (e.g. /cags-č<sup>h</sup>/ [ca.gəsč<sup>h</sup>] *загасч* ‘fisherman’), obviously a consequence of the fact (2c) that *gs* is an impossible coda (/cags/ [ca.gəs] *зарас* ‘fish’). It can be noted that all attested words with three-consonant codas are formed with suffixes.

### (3) *Three-consonant codas*

<i>mst<sup>h</sup></i>	/čims-t <sup>h</sup> /	<i>čimst<sup>h</sup></i>	жимст	‘having fruit’ (‘fruit-AR’)
<i>njst<sup>h</sup></i>	/ɔnjs-t <sup>h</sup> /	<i>ɔnjst<sup>h</sup></i>	онъст	‘lock-AR’
<i>ʃst<sup>h</sup></i>	/iʃs-t <sup>h</sup> /	<i>iʃst<sup>h</sup></i>	элст	‘sandy’ (‘sand-AR’)
<i>ʒst<sup>h</sup></i>	/xaʒs-t <sup>h</sup> /	<i>xaʒst<sup>h</sup></i>	хальст	‘peel-AR’

wst <sup>h</sup>	/taws–t <sup>h</sup> /	tawst <sup>h</sup>	давст	‘salty’ (‘salt–AR’)
mxt <sup>h</sup>	/nomx–t <sup>h</sup> /	nomxth <sup>h</sup>	номхт	‘to become tame’ (‘tame–VR’)
њxt <sup>h</sup>	/čanx–t <sup>h</sup> /	čanxth <sup>h</sup>	џанхт	‘to become sick’ (‘disease–VR’)
ѣxt <sup>h</sup>	/naѣjx–t <sup>h</sup> /	naѣjxt <sup>h</sup>	наъхт	‘to get mouldy’ (‘mould–VR’)
rxt <sup>h</sup>	/irx–t <sup>h</sup> /	irxt <sup>h</sup>	эрхт	‘competent’ (‘rights–AR’)
gsč <sup>h</sup>	/cigs–č <sup>h</sup> /	cigsč <sup>h</sup>	зэгсч	‘warbler’ (cf. <i>cigs</i> зэгс ‘reed’)
rsč <sup>h</sup>	/nuurs–č <sup>h</sup> /	nuursč <sup>h</sup>	нүүрсч	‘coalman’ (‘coal–AGNR’)
mxč <sup>h</sup>	/xamx–č <sup>h</sup> /	xamxč <sup>h</sup>	хамхч	‘to smash up’ (‘to pieces–VR’)
rxč <sup>h</sup>	/šark–č <sup>h</sup> /	šarkč <sup>h</sup>	шархч	‘coroner’ (‘wound–AGNR’)
wxč <sup>h</sup>	/xɔwx–č <sup>h</sup> /	xɔwxč <sup>h</sup>	ховхч	‘to break apart’ (‘apart–VR’)

A consonant string may satisfy the coda constraint without actually occurring as a coda, but in that case the string does not occur in phonological representations, either because of a segmental rule or because it is an accidental gap. The following restrictions hold in phonological representations for sequences of two word-final consonants:

(4) *Restrictions on final two-consonant combinations in phonological representations*

- (a) If the second consonant is palatalized (*tjh*, *tj*, *gj*, *xj*, *mj*, *nj*, *ѣj*, *rj*, *wj*), the first one must be one of these consonants as well (or, in a few words, *š* or *g*).
- (b) The velar nasal /ŋ/ occurs only before /š, x, g, gj, g/.
- (c) The glide /j/ does not occur as the second consonant (see 6.5 for a possible exception).
- (d) The labials /p, pj/ do not occur as the first consonant.
- (e) The labials /p, pj/ occur as the second consonant only after /m, є/ and the corresponding palatalized consonants.

## 6.2 SYLLABIFICATION OF MORPHOLOGICALLY SIMPLE WORDS<sup>3</sup>

In this section we will show that syllabification and epenthesis in morphologically simple words can be described by using the general principles of maximality and directionality (see e.g. Itô 1989). The only language-specific facts needed are the exact formulation of the coda constraint and the direction of syllabification.

When the phonological representation of a word ends in more consonants than can be accommodated in a syllable coda, one or more vowels are epenthized. An epenthetic vowel is never inserted at the end of a word, so if there are two final consonants, the epenthetic vowel (if necessary) is always inserted between them (see examples in 6.7). If a word ends in three consonants, a schwa (if necessary) is

<sup>3</sup> For notes on syllabification of morphologically simple words see App. F, 6.2, p. 222.

inserted before the two last consonants if they can form a coda (5a), and before the last consonant otherwise (5b).

(5)	(a) /gutmč/	gu.təmč	гудамж	'street'
	/gurnc/	gu.rənc	туранз	'emery'
	/šitms/	ši.təms	шидэмс	'fillet'
	/icʰstʰ/	i.cʰəstʰ	эцест	'as a result of'
	(b) /tʰarwg/	tʰar.wəg	тарвага	'marmot'
	/gurwž/	gur.wəž	гүрвэл	'lizard'
	/xitmŋ/	xit.məŋ	хэдмэн	'pear'
	/čʰothgr/	čʰoth.gər	чөтгер	'devil'
	/pompɡ/	pom.pəg	бөмбөг	'ball'
	/xuwčʰs/	xuw.cʰəs	хувцас	'clothes'

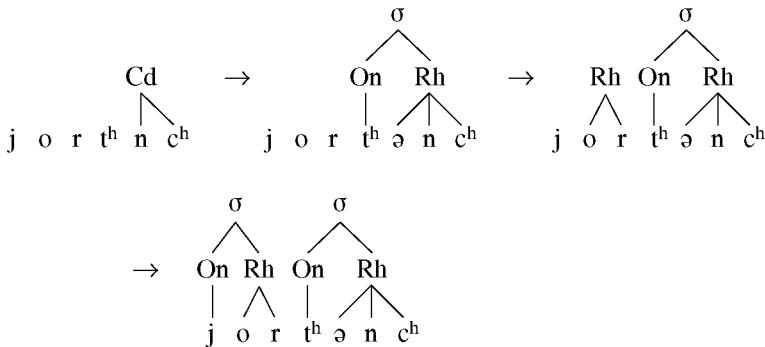
Epenthetic vowels are thus inserted as far to the left as possible, both in two- and three-consonant final clusters. For example, /gutmč/ 'street' is syllabified as *gu.təmč* гудамж, not \**gut.məč* (which does consist of two well-formed syllables). This can be described by assuming that syllabification proceeds from right to left, creates the largest possible syllable constituents (rhymes and onsets), and inserts epenthetic vowels only when necessary to build well-formed rhymes. Words consisting of one morpheme are thus syllabified by a right-to-left maximal procedure:

#### (6) *Monomorphemic syllabification*

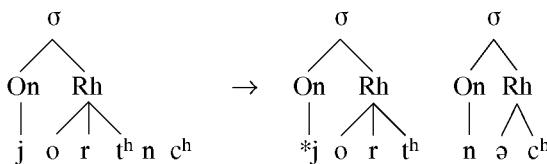
- (i) The phonological representation of the word is scanned from right to left and a maximal coda (possibly empty) is found.
- (ii) The coda is combined with the preceding vowel to make a rhyme. If the segment preceding the coda is a consonant, a schwa vowel is epenthesized as the nucleus of the rhyme.
- (iii) The preceding consonant becomes an onset, and the syllable is complete.
- (iv) If there are segments left, the procedure is repeated.

For an example of how monomorphemic syllabification works, consider the word /jortʰncʰ/ ертөнч 'world' (7a). The input string is scanned from right to left. The one-consonant string *cʰ* is a possible coda, but it is not maximal, since the string *ncʰ* also is a possible coda. Since *tʰncʰ* is not a possible coda, *ncʰ* is maximal and becomes a coda. The preceding segment *tʰ* is a consonant, so an epenthetic vowel must be inserted as a nucleus, *tʰ* becomes an onset, and the final syllable *tʰəncʰ* is completed. In the next step, *or* becomes a rhyme and *j* an onset. It can be noted that the direction is critical; maximal left-to-right syllabification of this word would result in the syllabification \**jortʰ.nəcʰ* (7b), which is incorrect, although it does consist of two well-formed syllables.

(7) (a)



(b)



This procedure describes syllabification correctly in morphologically simple words, not only those with final clusters of two or three consonants, but also those with longer consonant clusters or with more than one phonological vowel, as exemplified in (8).

(8) /połččmr/	pɔłčč.mər	болжмор	'lark'
/surwłč/	sur.włčč	сурвалж	'root'
/sarjmsg/	sa.rjəm.səg	саримсаг	'garlic'
/sarmgčhŋ/	sar.məg.čhŋ	сармагчин	'monkey'
/xawt̪hGčč/	xawt̪h.Gčč	хавтгалж	'snipe (bird)'
/xuuχłte/	xuu.xəł.te	хүүхэлдэй	'doll'
/gorčłtai/	gor.čł.tai	гургалдай	'nightingale'
/gałwsa/	gałwsa	(головсаа)	'sausage' (Ru <i>kolbasá</i> (see 3.3))

Right-to-left maximal syllabification assigns each segment in the phonological representation to either a rhyme or an onset, and there are no extrasyllabic segments. This syllabification procedure cannot produce rhymes consisting only of an epenthetic vowel, and it also guarantees that all syllables, except possibly the word-initial one, have an onset. This is consistent with the fact that any word-final surface consonant cluster can occur as the coda of a non-final syllable. In this respect, Mongolian is different from many other languages, such as Swedish, where some word-final consonant clusters are not allowed as codas in word-internal syllables.

There are some exceptions to the monomorphemic syllabification rule, which are at least partially phonologically conditioned. One exception is that words ending in a three-consonant cluster consisting of *ŋ* followed by a velar stop (*g*, *g<sup>j</sup>*, *g*) and a voiceless consonant are always syllabified by inserting the schwa after the

velar stop: /tʰɪŋgs/ /tʰiŋ.gəs/ тэнгэс ‘sea’ (not \*tʰi.nəgs); /čʰɪŋgs/ /čhiŋ.gəs/ Чингэс ‘Chinggis’ (not \*čhi.nəgs). This is obviously related to the existence of codas of the form *ng*, *ŋg*, *ŋG* (see (2a)).

Another class of exceptions involves words whose phonological representations end in preceded by two voiced consonants. In most such words, the epenthetic vowel is irregularly inserted immediately before *s* (9a). Some words follow the monomorphemic syllabification rule and insert the schwa before the sonorant–*s* cluster (b), and some vary more or less freely (c).

(9)	(a)	/tʰarws/	tʰar.wəs	тарвас	‘watermelon’
		/aʃms/	aʃ.məs	алмас	‘diamond’
		/xar̩jg̩s/	xar̩j.g̩əs	харгис	‘vicious’
		/ar̩jw̩s/	ar̩j.w̩əs	арвис	‘erudition’
	(b)	/aʃ̩rs/	a.ʃ̩ərs	алирс	‘lingonberry’
	(c)	/sar̩jms/	sar̩j.məs ~ sa.r̩jəms	саримс	‘garlic’
		/nuʃ̩jms/	nuʃ̩j.məs ~ nu.ʃ̩jəms	нулимс	‘tear’

### 6.3 SCHWA ~ ZERO ALTERNATION

In the preceding section it was shown that schwa epenthesis in monomorphemic words is governed by the syllabification rule (6). In derived and inflected words there are frequent alternations between schwas and zero, also governed by syllabification rules, although there is feedback from the alternation rules to the syllabification rules leading to cyclic syllabification (6.4).

The schwa ~ zero alternations which take place in suffixation can be illustrated by the nine words in (10), built up by successively adding suffixes to the root /uiʒ/ ‘action’. Because of the suffixing and agglutinative nature of the language, similar examples are not uncommon.

#### (10) Schwa ~ zero alternation

(a)	Root	/uiʒ/	uiʒ	үйл	‘action’
(b)	VR	/-č̩ʒ/	uiʒ.č̩əʒ	үйлчил	‘to serve’
(c)	CAUS	/-Uʒ/	uiʒč̩.k̩uʒ	үйлчлүүл	‘to cause to serve’
(d)	AGENT	/-gč̩/	uiʒč̩.k̩u.č̩əgč̩	үйлчлүүлэгч	‘customer’
(e)	PL	/-t/	uiʒč̩.k̩u.č̩əg.č̩ət	үйлчлүүлэгчид	‘customers’
(f)	GEN	/-iŋ/	uiʒč̩.k̩u.č̩əgč̩.tiŋ	үйлчлүүлэгчидийн	‘of the customers’
(g)	NR	/-x/	uiʒč̩.k̩u.č̩əgč̩.tiŋx	үйлчлүүлэгчидийнх	‘customers’ belongings’
(h)	DAT	/-t/	uiʒč̩.k̩u.č̩əgč̩.tiŋ.xət	үйлчлүүлэгчидийнхэд	
(i)	RFL	/-E/	uiʒč̩.k̩u.č̩əgč̩.tiŋx.te	үйлчлүүлэгчидийнхээ	

A schwa vowel is inserted in (10b, d, e, h), and one is deleted in (c, f, i). Inspection of the syllabification of the nine words in (10) shows that they are all syllabified by rule (6), although they are not monomorphemic (except the root). The zero ~ schwa alternations can thus be explained as automatic consequences of the syllabification rule. Some more examples will be given to illustrate this.

The simplest case is that no epenthesis or schwa deletion takes place. The suffix can be incorporated into the final syllable of the stem (11a), or it can form its own syllable (b). If the suffix begins with a vowel, the final consonant of the stem becomes an onset (c). Some suffixes begin with two consonants, the first of which can be incorporated into the final syllable of the stem, the rest of the suffix forming a syllable (d). A schwa can be inserted inside a suffix (e) or between the stem and a suffix (f), but not into the stem, as will be shown in section 6.4 below. Finally, deletion of a schwa vowel in the stem-final syllable takes place if the stem ends in a schwa plus a single consonant, and the suffix begins with a vowel (g). If the suffix can form a coda, the schwa is moved from the stem to the place between the stem and the suffix (h).

(11) *Schwa deletion and insertion*

(a)	ar – /t/	→ art	ард	'back–DAT'
	nee – /gt/	→ neegt	нээгд	'to open–PASSIVE'
(b)	co.wəł̥ – /ł̥E/	→ co.wəł̥.ł̥o	зөвлөлөө	'to advise–DPST'
	mɔr̥ – /t̥Ei/	→ mɔr̥.t̥ɔi	морьтой	'horse–COM'
(c)	mał̥ – /E/	→ ma.ła	малаа	'cattle–RFL'
	gu.təmč – /Er/	→ gu.təmč.čar	гудамжаар	'street–INST'
(d)	pai – /kʰgE/	→ paichʰ.ga	байцгаа	'to be–COLL'
	a.su – /ŋUtʰ/	→ a.suŋ.gutʰ	асуунгут	'to ask– BENEFACTIVE'
(e)	ɔr – /čʰx/	→ ɔr.čʰəx	орчих	'to enter– INTENSIVE'
	čʰi.xər – /żg/	→ čʰi.xər.żəg	чихэрлэг	'sugary' (‘sugar–AR’)
(f)	xɔtʰ – /t/	→ xɔ.tʰət	хотод	'town–DAT'
	martʰ – /gt/	→ mar.tʰəgt	мартагд	'to forget–PASSIVE'
(g)	xa.mər – /E/	→ xam.ra	хамраа	'nose–RFL'
	xa.rəw – /Uł̥/	→ xar.wuł̥	харвуул	'to shoot–CAUS'
(h)	xa.rəw – /n/	→ xar.wən	харвана	'to shoot–NPST'
	xa.rəw – /gčʰ/	→ xar.wəgčʰ	харвагч	'to shoot–AGENT'

There are instances of schwas which never alternate with zero, including those found in non-final syllables (e.g. in *xuu.xəł̥.te* хүүхэлдэй ‘doll’) or in final syllables with a complex coda (e.g. *gu.təmč* гудамж ‘street’). Rhymes consisting only of a schwa occur only in non-final syllables (see Table 6.1), and thus never alternate with zero.

6.4 CYCLIC SYLLABIFICATION<sup>4</sup>

It was shown in section 6.2 that morphologically simple words are syllabified and provided with epenthetic vowels by a rule that is maximal and right-to-left directional. As seen in section 6.3, this rule often applies to derived or inflected words as well, but as was pointed out by Damdinsürèn (1946: 20; 1958: 27), Coloo (1976: 129; 1987: 29), Saitô (1986), and others, there are some Halkh words which differ only by the presence or absence of a reduced vowel, for example, *xažəx* халх ‘to change’ vs. *xažəx* халх ‘shield; Halkh’. According to our observations, there are also words which differ only in the place of reduced vowels, for example, *cowləžəžo* зөвлөлөө ‘advice–RFL’ vs. *cowləžəžo* зөвлөлөө ‘to advise–DPST’ (according to the standard spelling rules these two non-homophonous words are spelled in the same way). An analysis which treats reduced vowels as non-phonemic and derivable by purely phonological rules is thus impossible in Standard Halkh Mongolian. If, however, the morphology is taken into account, the phonetically reduced vowels can be analysed as being absent from phonological representations; see Svantesson (1988a; 1994; 1995a), a similar analysis was proposed by Saitô (1984). This can be illustrated with the following pairs of words with identical segments, or segments belonging to the same sonority classes, but with different morphological structure and different syllabification. The first word in each pair is syllabified by rule (6), but not the second one.

- |                      |              |          |                           |
|----------------------|--------------|----------|---------------------------|
| (12) (a) /cowləž–žE/ | co.wəž.žo    | зөвлөлөө | ‘advised’ (‘advise–DPST’) |
| /cowləž–ž–E/         | cow.žə.žo    | зөвлөлөө | ‘his advice’              |
|                      |              |          | (‘advise–NR–RFL’)         |
| (b) /alʒtʰ–t–mž/     | alʒ.tʰət.məž | алтадмал | ‘gilded’ (‘gold–VR–AR’)   |
| /art–čhž–ž/          | art.čhə.žəž  | ардчилал | ‘democratization’         |
|                      |              |          | (‘people–VR–NR’)          |

To see why the words in these pairs are syllabified in different ways, we show each step in the derivations in (13).

- |               |          |              |          |                        |
|---------------|----------|--------------|----------|------------------------|
| (13) (a) Root | /cowləž/ | co.wəž       | зөвлө    | ‘to advise’            |
| DIRECT PAST   | /–žE/    | co.wəž.žo    | зөвлөлөө | ‘advised’              |
| (b) Root      | /cowləž/ | co.wəž       | зөвлө    | ‘to advise’            |
| NOMINALIZER   | /–ž/     | cow.žəž      | зөвлөл   | ‘advice’               |
| REFLEXIVE     | /–E/     | cow.žə.žo    | зөвлөлөө | ‘his advice’           |
| (c) Root      | /alʒtʰ/  | alʒtʰ        | алт      | ‘gold’                 |
| VERBALIZER    | /–t/     | alʒ.tʰət     | алтад    | ‘to gild’              |
| ADJECTIVIZER  | /–mž/    | alʒ.tʰət.məž | алтадмал | ‘gilded’               |
| (d) Root      | /art/    | art          | ард      | ‘people’               |
| VERBALIZER    | /–čhž/   | art.čhə.žəž  | ардчил   | ‘democratize’          |
| NOMINALIZER   | /–ž/     | art.čhə.žəž  | ардчилал | ‘democratiza-<br>tion’ |

<sup>4</sup> For notes on cyclic syllabification, see App. F, 6.5, p. 223.

Inspection of these and other similar examples shows that maximal right-to-left syllabification (6) is not applied in those cases when it would require insertion of a new epenthetic vowel into the already syllabified part of the word, as would be the case if this rule were applied in the final step in (13b, d): *cow.čək-/E/* → \**co.wəčk*.*čo*; *art.čək-/č/* → \**ar.təčh.čək*. The actual syllabifications *cow.čə.čo* and *art.čhə.čək* avoid this.

Thus, the general syllabification rule for morphologically complex words can be expressed in terms of a constraint on resyllabification after a suffix has been added. A suffixed word is syllabified as if it were monomorphemic, unless this forces a new epenthetic vowel to be inserted in the (already syllabified) stem to which the suffix is added:

(14) *Resyllabification constraint*

On each morphological cycle, an epenthetic vowel cannot be inserted into the already syllabified part of a word.

Thus syllabification is cyclic in relation to the morphology in the sense that after a suffix has been added, the word is resyllabified according to the monomorphemic syllabification rule (6), unless the resyllabification constraint is violated. In that case, the stem is left unchanged, and the epenthetic vowel (if necessary) is added after it. This results in a syllable whose rhyme consists only of an epenthetic vowel.

Some other words where this rule applies are shown in (15).

(15) *Examples of cyclic syllabification*

<i>ar.gəč</i> – /ig/ → <i>ar.gə.čig</i>	аргалыг ‘dried dung-ACC’
(not * <i>a.rəč.čig</i> )	

<i>tʰog.rəg</i> – /or/ → <i>tʰog.rə.gor</i>	төгрөөр ‘ring-INST’
(not * <i>tʰo.gər.gor</i> )	

<i>tʰog.rəg</i> – /č/ → <i>tʰog.rə.gəč</i>	төгрөглө ‘to circulate’ (‘ring-VR’)
(not * <i>tʰo.gər.gəč</i> )	

The resyllabification constraint ensures that a schwa vowel in a non-final syllable cannot be deleted, since that would necessitate the insertion of a schwa in the stem. When a suffix is added to a word which has a *Cə* syllable, cyclic syllabification thus preserves this epenthetic vowel: *art.čə.čək-/t/* → *art.čhə.čəkt* ‘democratization-DAT’ *art.čhə.čək-/as/* → *art.čhə.čəkas* ‘democratization-ABL’; monomorphemic syllabification would give \**ar.təčh.čəkt* in the first word, but the correct result in the second one.

Cyclic syllabification can also explain the syllabification of words with the plural suffix *-t*, which is one of several plural suffixes, chosen partly lexically and partly phonologically. Examples are *mir.gət* мэргэд ‘sages’, and *tʰuš.mət* түшмэд ‘officials’, where maximal right-to-left syllabification would lead to \**mi.rəgt* and \**tʰu.šəmt*. This suffix regularly replaces a final *y* (or, in a few words, another sonorant) in the stem, and the singulars of the exemplified words are *mir.gəy* мэргэн and *tʰuš.məž* түшмэл. The resyllabification constraint (14) blocks the insertion of an

epenthetic vowel in the stem (e.g. *mir:gəŋ* → \**mi.rəgɪ*), and thus blocks maximal right-to-left syllabification.

It can be noted that derivational and inflectional suffixes are treated in the same way by the syllabification rule (and, as far as we know, by other phonological rules). Thus there seems to be no need to divide the phonology and morphology into strata depending on the type of suffix. On each cycle, the syllabification rule does not need access to the input string's morphological structure, only to its syllabification.

#### 6.4.1 *The verb suffix –(ə)x*

As mentioned above, there are contrasts of the type exemplified in (16). They involve the future participle suffix [–(ə)x] (also known as ‘irrealis’ or ‘infinitive’), realized as *-x* after vowels and as *-əx* after consonants. The existence of such contrasts was noted by the main designer of the Cyrillic Mongolian script, Cèndijn Damdinsürèn, and seems to be one important reason why he chose to write epenthetic vowels in Cyrillic Mongolian rather than follow the example of the Cyrillic Kalmuck script, where epenthetic vowels are not written (Damdinsürèn 1946: 20; 1958: 27; cf. also Coloo 1987: 29).

- (16) (a) *xa.łəx*    *халах*    ‘to change–FUTP’  
*i.řəx*            *ирэх*            ‘to come–FUTP’  
*sa.wəx*          *савах*          ‘to beat–FUTP’
- (b) *xałx*          *халх*          ‘shield’  
*irx*                *эрх*                ‘power’  
*sawx*              *савх*              ‘chopsticks’

These future participle forms violate the epenthesis rules, unlike other verb forms with suffixes consisting of a single obstruent, such as the imperfect gerund *-č*. This suffix is regular, so that the verbs in (16a) have the imperfect gerund forms *xałč* *халж*, *irč* *ирж*, *sawč* *савж*, without schwas. The irregular *-əx* forms are not phonologically conditioned, since the phoneme *x* always functions regularly as a voiceless obstruent in morphologically simple words like those given in (16b) above. Furthermore, there are other suffixes with the phonological form *-x*, with nominalizing or verbalizing function, and they behave regularly, for example, in */aaw-iŋ-x/ aawiŋx* *аавынх* ‘what belongs to father’ (‘father–GEN–NR’), */teer-x/ teerx* *дээрх* ‘that above’ (‘above–NR’), and */paatʰr-x/ paatʰərx* *баатарх* ‘to act as a hero’ (‘hero–VR’).

The *x* of the future participle suffix thus requires a vowel before it, or, equivalently, it requires to be the whole syllable coda (and not just part of the coda). The phonological representation of this suffix is problematic. One possibility would be to represent it as /-əx/, although schwas do not occur otherwise in phonological representations. It would then be necessary to introduce an exception to consonant epenthesis (see 5.2.5), however, so that forms like the future participle of *nee* *нээ* ‘to open’ do not surface as \**neegəx* instead of *neex* *нээх*. Another problem with

this analysis is the fact that the future participle suffix behaves regularly, like other instances of *x*, on following morphological cycles, where its epenthetic vowel usually is deleted if this is required by the syllabification rules. For example, the ablatives of the words *xažəx* халах ‘to change–FUTP’ and *xažx* халх ‘shield’ are normally pronounced in the same way, as *xažxas*, although they are written differently (халахаас, халхаас). Like other schwas, the one in this suffix may disappear depending on the speech style (see Fig. 2.8 for an example).

It might be remarked that there is nothing unusual about this suffix except its aberrant phonology. It is very common and completely productive in the contemporary language, it existed already in the oldest known stages of Mongolian (Weiers 1969: 160 ff.), and its present form is the regular reflex of its earliest form, Old Mongolian \*-k<sup>h</sup>U (\*[q<sup>h</sup>u ~ k<sup>h</sup>y]).

## 6.5 THE PHONEMIC STATUS OF PALATAL GLIDES

It is well known that glides and the corresponding vowels are in complementary distribution in many languages. This fact is implicit in the orthography of, for instance, Latin, and was pointed out explicitly at least as early as by Whitney (1862: 310). Expressed in modern language, his proposal is to use the same phonological representation for the glide and the corresponding vowel, and this is often assumed by modern phonologists as well (see e.g. the discussion in Goldsmith 1990: 151ff.). In this section, the representation of Mongolian [i] and [j] is discussed in relation to syllabification, following Svantesson (1996) (see also Saitô 1985).

The assumption that [i] and [j] are allophones of one phoneme in Mongolian is supported by the behaviour of the optative suffix, which is *-i* with consonant-final stems (17a) and *-j* with vowel-final stems (b); the Cyrillic Mongolian spelling of this suffix is a bit idiosyncratic.

(17)	(a)	xar	хар	‘to look’	<i>optative:</i>	xar-i	харья
		it	ид	‘to eat’		it-i	идье
	(b)	uu	үү	‘to drink’		uu-j	үүя
		xuwa	хувaa	‘to divide’		xuwa-j	хуваая
		nee	нээ	‘to open’		nee-j	нээе

This might suggest that the optative suffix is represented as /i/, which is realized as [j] when it is adjacent to a vowel, and that [j], which is always adjacent to a vowel, might in general be represented as an allophone of /i/. This solution is, however, problematic for two reasons. The first reason is that a vowel suffix after a vowel would normally trigger epenthesis of *g/g* (5.2.5), and the second one is the existence of surface contrasts between *i*-diphthongs and the combinations of a vowel and [j]:

(18)	aj	ая	'melody'	ai	ай	'category'
	ɔj	оё	'to sew'	ɔi	ой	'forest'
	uj	уя	'to tie'	ui	уй	'sorrow'
	uj	ye	'joint'	ui	үй	'to brew'
	pij	бие	'body'	xii	хий	'air'

The *Vi* diphthongs and the *Vj* combinations are phonetically realized as diphthongs, which differ from each other in their paths in the F1–F2 plane (1.3); the combination *ij* is phonetically identical to the long vowel *ii* in normal speech, however, so that *pij* and *xii* are pronounced [pi:ʃ], [xi:ʃ]. The historical development of the *Vi* ~ *Vj* contrast is due to deletion of word-final short vowels (cf. 10.5.1):

(19) *Old Mongolian Halk*

*huja	uj	уя	'to tie'
*uje	uj	ye	'joint'
*hoi	ɔi	ой	'forest'
*tʰaulai	tʰuułai	туулай	'hare'

The two glides *j* and *i* show different phonological behaviour before vowel-initial suffixes, such as instrumental *-Er*:

(20) (a)	aj	ая	'melody'	instrumental:	aj–ar	аяар
	ɔj	гоё	'elegant'		ɔj–ər	гоёэр
	uj	ye	'joint'		uj–er	yeэр
	pij	бие	'body'		pij–er	биеэр
(b)	ai	ай	'category'		ai–gar	айгаар
	ɔi	ой	'forest'		ɔi–goor	ойгоор
	xui	хүй	'group'		xui–ger	хүйтээр
	xii	хий	'air'		xii–ger	хийтээр

These examples show that *i* triggers consonant epenthesis (5.2.5) and thus functions as a vowel, while *j* behaves as a consonant. As comparison with (17) shows, this is confirmed by the treatment of the optative suffix *-i/j* (21). The optative forms in (21a) are disyllabic and those in (21b) monosyllabic.

(21) (a)	xaj	хая	<i>optative</i> : 'to leave'	xaj–i	хаяя
	ɔj	оё	'to sew'	ɔj–i	оёё
	uj	уя	'to tie'	uj–i	уяя
(b)	xai	хай	'to seek'	xai–j	хайя
	ɔi	ой	'to bounce'	ɔi–j	ойё
	gui	гуй	'to ask for'	gui–j	гуйя

The difference between *i* and *j* is also seen in vowel epenthesis. Both can co-occur with a following voiceless consonant within the same syllable (22a), but only *i* can combine with a following voiced consonant in the same syllable (b) or with a voiced–voiceless cluster (c). In these cases, *j* requires an epenthetic vowel, making

the word disyllabic at least in careful lexical pronunciation. Thus, *i* functions as a part of the syllable nucleus, while *j* functions as a consonant.

- (22) (a) /uis/ uis ўйс ‘birchbark’  
       /uis/ ujs ўјс ‘time’
- (b) /pair/ pair байр ‘place’  
       /pajr/ pajər баяр ‘happiness’
- (c) /xaiłcʰ/ xaiłcʰ хайлц ‘fusibility’  
       /xaj-łcʰ/ xajəłcʰ хаялц ‘to leave–COOP’

In conclusion, Mongolian [j] and [i] contrast on the surface, and behave phonologically in different ways both as regards consonant and vowel epenthesis. Obviously, they must be differentiated in some way in the phonological representation. We will assume that [i] is specified as a vowel and [j] as a consonant.

Returning to the optative, which alternates between [-j] and [-i], one solution is to assume the phonological representation /-j/. As seen in (4c), the consonant /j/ does not occur together with a preceding consonant at the end of a word in phonological representation, that is, words never end in /Cj/; equivalently, no surface syllable has the rhyme [əj]. If the optative is represented as /-j/, adding it after a consonant would result in a syllable of this type, and assuming that the rhyme *əj* is realized phonetically as [i] will give the correct phonetic output. For example, the word /xar-ji/ ‘look–OPTATIVE’ gets the form *xarəj* which is realized phonetically as [xari] (cf. (17)). This would also explain why the consonant preceding [i] is not palatalized in these words.

## 6.6 WORD STRUCTURE<sup>5</sup>

There are few restrictions on how syllables can be put together to form words in Mongolian, so the word structure can be inferred from the syllable structure and from vowel harmony, which regulates the distribution of vowels within words. The only basic restriction is that a word cannot consist of only a short vowel or a consonant and a short vowel, so the minimal word structure is (C)VV (as in *uu* *yy* ‘to drink’; *tʰoo* *too* ‘number’; *ɔi* *ой* ‘forest’; *xvi* *хүй* ‘sheath’) or (C)V(C) (*ar* *ap* ‘back’; *xoł* *хөл* ‘foot’). A few monosyllabic function words are written with an orthographic short vowel but are nevertheless pronounced with a long vowel, at least in citation form (cf. Hattori 1951: 85; Tömörčerèn 1968; Sanžeev 1978: 88). These include the pronouns *pii* *би* ‘I’, *čii* *чи* ‘you’, *tʰaa* *та* ‘you (honorific)’, the conjunction *paa* *ба* ‘and’, and the question marker *bee/wee* *бэ/вэ*. This restriction might be expressed by saying that a word must consist of two moras, assuming that a syllable with a short vowel consists of one mora and that an additional vowel, or a consonant in the syllable coda, contributes one mora. We will not develop this

<sup>5</sup> Zolhoev (1972); Dyrheeva and Buhaeva (1978); Buraev (1985b); O. D. Buhaeva (1989; 1991a, b); Dyrheeva (1991).

further here; the mora concept is used in Chapter 7 on prosody, but a slightly different definition of the mora is employed there. It can be argued that at least some of these words have a short vowel which turns up in inflected words, for example, *pit* бид ‘we’, *čʰini* чиний ‘your’, *tʰant* танд ‘to you’, so that the long vowel in the uninflected word is due to a phonetic realization rule.

Root words do have a simpler structure than derived or inflected words, but this remains to be investigated, like many other problems in Mongolian phonotactics.

## 6.7 FINAL CONSONANT COMBINATIONS

As mentioned in section 6.1.2, the following tables exemplify all attested combinations of two final underlying consonants.

<i>atʰətʰ</i>	атат	‘having a camel’	<i>pɔtʰətʰ</i>	ботит	‘having volumes’
<i>ɔtʰəčʰ</i>	оточ	‘doctor’			
<i>putʰəčʰ</i>	бүтэц	‘structure’			
<i>xatʰət</i>	Хятад	‘China’	<i>pɔtʰət</i>	ботид	‘volume–DAT’
<i>xatʰəč</i>	хатаж	‘to dry–IPFG’			
<i>tʰatʰəš</i>	таташ	‘mincemeat’			
<i>utʰəs</i>	утас	‘thread’			
<i>utʰəg</i>	утга	‘meaning’			
<i>nutʰəg</i>	нутаг	‘homeland’	<i>xatʰəg</i>	хатиг	‘furuncle’
<i>tʰutʰəm</i>	тутам	‘each’			
<i>tɔtʰən</i>	дотно	‘inside’			
<i>putʰəŋ</i>	бутан	‘jar’			
<i>gułʰəč</i>	гутал	‘boots’	<i>pɔtʰəč</i>	ботил	‘volume–VR’
<i>paatʰər</i>	баатар	‘hero’	<i>xatʰər</i>	хатир	‘trot’
<i>xatʰəw</i>	хатав	‘to dry–PST’			
<i>xučʰətʰ</i>	хучит	‘powerful’	<i>acʰətʰ</i>	ацат	‘forked’
<i>pačʰəčʰ</i>	бачич	‘swindler’			
<i>ačʰəcʰ</i>	ачиц	‘once loaded’			
<i>cɔčʰət</i>	зочид	‘guests’	<i>guichʰət</i>	гүйцэд	‘complete’
<i>ɔčʰəč</i>	очиж	‘to go to–IPFG’	<i>tʰɔčʰəč</i>	тооцож	‘to reckon–IPFG’
<i>xuučʰəs</i>	хуучис	‘old things’	<i>icʰəs</i>	бусан	‘roundworm’
<i>pičʰəg</i>	бичиг	‘writing’	<i>cʰacʰəg</i>	эцэс	‘end’
<i>pačʰəm</i>	бачим	‘urgent’		цацаг	‘tassel’
<i>ɔčʰən</i>	очино	‘to go to–NPST’	<i>tʰɔčʰən</i>	тооцно	‘to reckon–NPST’
<i>cɔčʰəŋ</i>	зочин	‘guest’	<i>tʰɔčʰəŋ</i>	тооцон	‘to reckon–CV’
<i>uučʰəč</i>	уучил	‘to forgive’	<i>pučʰəč</i>	буцал	‘to boil’
<i>učʰər</i>	учир	‘reason’	<i>xacʰər</i>	хацар	‘cheek’
<i>ɔčʰəw</i>	очив	‘to go to–PST’	<i>tʰɔčʰəw</i>	тооцов	‘to reckon–PST’

čatət <sup>h</sup>	жадат	'spear-AR'	pət <sup>j</sup> ət <sup>h</sup>	бодит	'real'
čatəč <sup>h</sup>	жадач	'spearman'			
mitəč <sup>h</sup>	мэдэц	'knowledge'			
ətət	одод	'stars'			
utəč	удаж	'to stay-IPFG'			
utəš	үдэш	'evening'			
gatəs	гадас	'stake'	pət <sup>j</sup> əs	бодис	'matter'
satəg	садга	'effigy'			
atəg	адаг	'end'	c <sup>h</sup> at <sup>j</sup> əg	цадиг	'biography'
utəm	удам	'origin'			
gatən	гадна	'outside'			
putəŋ	будан	'mist'			
xutəž	худал	'lie'	at <sup>j</sup> əž	адил	'like'
otər	өдөр	'day'	gat <sup>j</sup> ər	гадир	'quince'
sitəw	сэдэв	'theme'			
cheečət <sup>h</sup>	цээжит	'chest-AR'	acət <sup>h</sup>	азат	'lucky'
sačəč <sup>h</sup>	сажиц	'amplitude'			
xočət	хожид	'to be late'	icət	эзэд	'owners'
ačəč	ажиж	'to notice-IPFG'	ucəč ucəš-gui	үзэж үзэшгүй	'to see-IPFG' 'unsightly'
teečəs	дээжис	'choice food'			
počəg	божго	'child's penis'	počəg	бозго	'small feather'
pučəg	бужиг	'dance'	ucəg	үзэг	'pen'
uučəm	уужим	'wide'	ucəm	үзэм	'raisin'
ačən	ажна	'to notice-NPST'	ucən	үзнэ	'to see-NPST'
tuučəŋ	дүүжин	'swing'	šaacəŋ	шаазан	'porcelain'
ačəž	ажил	'work'	ucəž	үзэл	'view'
šičər	шижир	'pure'	gacər	газар	'ground'
ačəw	ажив	'to notice-PST'	ucəw	үзэв	'to see-PST'
aaš <sup>h</sup>	аашт	'character-AR'	ust <sup>h</sup> usc <sup>h</sup>	уст уч	'to disappear' 'waterman'
t <sup>h</sup> ušəč <sup>h</sup>	тушиц	'base'			
ašət	ашид	'always'	usət	үсэд	'extremely'
itešəč	идээш-	'to infuse-IPFG'	xusəč	хүсэж	'to want-IPFG'
	иж		t <sup>h</sup> isəš-gui	тэсэнгүй	'unbearable'
išəs	ишиц	'stems'			
pošəg	бошго	'official'	pošəg	босго	'threshold'
pošəg	бошиг	'decree'	usəg	үсэг	'script'
uušəg <sup>j</sup>	уушги	'lung'			
čišəm	жишиим	'comparable'	xusəm	хусам	'scale'
itešən	идээшинэ	'to infuse-NPST'	xusən	хүснэ	'to want-NPST'

paišej	байшин	'building'	xɔcsəj	хоосон	'empty'
aašež	аашил	'to behave'	tusəž	дусал	'drop'
pišer	бишир	'to worship'	asər	асар	'very'
itešew	идээшив	'to infuse—PST'	tʰosəw	төсөв	'budget'
t <sup>b</sup> uuxt <sup>h</sup>	түүхт	'historical'	pəx <sup>j</sup> t <sup>h</sup>	бохът	'to become tarry'
t <sup>b</sup> uuxc <sup>h</sup>	түүхч	'historian'	ax <sup>j</sup> əc <sup>h</sup>	ахиц	'progress'
xooxəc <sup>h</sup>	хөхөц	'indigo'			
xuuhxət	хүүхэд	'child'			
uxəč	үхэж	'to die—IPFG'	sax <sup>j</sup> əč	сахиж	'to guard—IPFG'
gaixəš	гайхаш	'surprise'	ax <sup>j</sup> əš—gui	ахишигүй	'irreproducible'
noxəs	нохос	'dogs'	cɔx <sup>j</sup> əs	зохис	'propriety'
uxəg	үхэг	'chest'	sax <sup>j</sup> əg	сахиг	'to guard—IMP'
šaxəm	шахам	'nearly'	tʰax <sup>j</sup> əm	тахим	'back of the knee'
uxən	ухна	'billy-goat'	sax <sup>j</sup> ən	сахина	'to guard—NPST'
saixəŋ	сайхан	'beautiful'	cɔx <sup>j</sup> əŋ	охин	'girl'
saxəž	сахал	'beard'	sax <sup>j</sup> əž	сахил	'vow'
uxər	үхэр	'ox'	tʰax <sup>j</sup> ər	тахир	'curved'
uxəw	үхэв	'to die—PST'	sax <sup>j</sup> əw	сахив	'to guard—PST'
t <sup>b</sup> agt <sup>h</sup>	тагт	'balcony'			
pɔgəč <sup>h</sup>	богоч	'front leg tie'			
pagət	багад	'small—DAT'			
pagəč	багаж	'tool'			
cagəs	загас	'fish'			
sagəg	сагаг	'buckwheat'			
šuğəm	шугам	'line'			
pagən	багана	'pillar'			
tagəŋ	даган	'to follow—CV'			
t <sup>b</sup> uğəž	тугал	'calf'			
raigəž <sup>j</sup>	байгаль	'nature'			
agər	агар	'cypress'			
ħagw	лхагва	'Wednesday' (pronounced [ħaɣʷ]; see 2.5)			
t <sup>b</sup> agt <sup>h</sup>	тагт	'capped'			
igč <sup>h</sup>	эгч	'elder sister'			
pɔgč <sup>h</sup>	богц	'saddle bag'			
pɔgt	богд	'holy'	pɔg <sup>j</sup> t	богъд	'experienced—DAT'
ugč	үгж	'feeding-bottle'	uug <sup>j</sup> č	үутъж	'to smoke—IPFG'
t <sup>b</sup> agc	тагз	'hovel'			
pagš	багш	'teacher'			
sags	cagc	'basket'	cag <sup>j</sup> s	загъс	'let foal suckle other foal's mother'

ogəg	өгөг	'to give—IMP'	c <sup>b</sup> ɔg <sup>j</sup> əg	цогиг	'to canter—IMP'
igəm	эгэм	'collar-bone'	aag <sup>j</sup> əm	аагим	'burning hot'
ogən	өгнө	'to give—NPST'	pɔg <sup>j</sup> ən	богино	'short'
ogəŋ	өгөн	'to give—CV'	uug <sup>j</sup> əŋ	үүтин	'to smoke—CV'
šugəž	шүгэл	'whistle'	pag <sup>j</sup> əž	багил	'grey-black'
šugər	Шүгэр	(a name)			
ogəw	өгөв	'to give—PST'	uug <sup>j</sup> əw	үүтив	'to smoke—PST'
xaamt <sup>h</sup>	хамт	'together'	am <sup>j</sup> t <sup>h</sup>	амът	'living'
imč <sup>h</sup>	эмч	'doctor'	am <sup>j</sup> č <sup>h</sup>	амъч	'egoist'
c <sup>b</sup> amc <sup>h</sup>	цамц	'shirt'			
ķimp	лимбэ	'flute'			
x <sup>j</sup> amt	хямд	'cheap'	am <sup>j</sup> t	амъд	'alive'
simč	сэмж	'omentum'	xum <sup>j</sup> č	хумъж	'to gather—IPFG'
ɔims	оимс	'sock'	am <sup>j</sup> s	амъс	'to breathe'
č <sup>b</sup> imx	чимх	'pinch'			
			t <sup>h</sup> am <sup>j</sup> x <sup>j</sup>	тамхи	'tobacco'
t <sup>b</sup> aməg	тамга	'seal'			
aiməg	аймаг	'district'	xum <sup>j</sup> əg	хумиг	'to gather—IMP'
omən	өмнө	'southern'	xum <sup>j</sup> ən	хумина	'to gather—NPST'
gɔiməŋ	гоймон	'noodles'	xum <sup>j</sup> əŋ	хумин	'to gather—CV'
taaməž	даамал	'controller'	t <sup>h</sup> əm <sup>j</sup> əž	томил	'to appoint'
xamər	хамар	'nose'	t <sup>h</sup> am <sup>j</sup> ər	тамир	'strength'
niməw	нэмэв	'to add—PST'	xum <sup>j</sup> əw	хумив	'to gather—PST'
ont <sup>h</sup>	унт	'to sleep'	ɔn <sup>j</sup> t <sup>h</sup>	оньт	'notched'
anč <sup>h</sup>	анч	'hunter'	sɔn <sup>j</sup> č <sup>h</sup>	соньч	'curious'
ganc <sup>h</sup>	ганц	'single'	xan <sup>j</sup> č <sup>h</sup>	ханьц	'to associate'
tont	дунд	'middle'	gɔn <sup>j</sup> t	гоньд	'caraway'
tanč	танаж	'to trim—IPFG'	t <sup>h</sup> an <sup>j</sup> č	таньж	'to recognize—IPFG'
			man <sup>j</sup> č	Манж	'Manchu'
panč	банз	'board'			
tans	данс	'account'	ɔn <sup>j</sup> s	оньс	'lock'
			t <sup>h</sup> an <sup>j</sup> x <sup>j</sup>	танхи	'spoiled'
unəg	унага	'foal'			
xənəg	хоног	'day and night'	t <sup>h</sup> an <sup>j</sup> əg	таниг	'to recognize—IMP'
sanəm-	санам-	'unimaginable'			
gui	гүй				
unən	унана	'to fall—NPST'	t <sup>h</sup> an <sup>j</sup> ən	танина	'to recognize—NPST'
unəŋ	үнэн	'truth'	sɔn <sup>j</sup> əŋ	сонин	'news'
ənəž	онол	'theory'	t <sup>h</sup> an <sup>j</sup> əž	танил	'acquaintance'
unər	үнэр	'smell'	an <sup>j</sup> ər	анир	'noise'

unəw	унав	'to fall—PST'	t <sup>h</sup> an <sup>j</sup> əw	танив	'to recognize—PST'
үңш	үнш	'to read'			
c <sup>h</sup> ɔŋx	цонх	'window'			
m <sup>j</sup> aŋg	мянга	'thousand'			
moŋg	мөнгө	'silver'			
ang <sup>j</sup>	анги	'class'			
alʒ <sup>h</sup>	алт	'gold'	całʒ <sup>h</sup>	зальт	'cunning'
iłʒ <sup>h</sup>	элч	'messenger'	xuałʒ <sup>h</sup>	хуульч	'lawyer'
suułʒc <sup>h</sup>	суулц	'to attend'	xɔłʒic <sup>h</sup>	хольц	'mixture'
śilʒp	шилбэ	'shin'	xɔłʒip <sup>j</sup>	холби	'off'
pɔłʒt	болд	'steel'	xuałʒit	хуульд	'law—DAT'
eełʒč	ээлж	'turn'	pɔłʒč	болж	'to stop—IPFG'
aałʒc	аалз	'spider'			
t <sup>h</sup> ułʒš	тулш	'fuel'			
ułʒs	улс	'state'	xalʒis	хальс	'peel'
t <sup>h</sup> ałʒx	талх	'bread'	sałʒix <sup>j</sup>	салхи	'wind'
xaałʒəg	хаалга	'door'			
ałʒəg	алаг	'motley'	śałʒəg	шалиг	'obscene'
ułʒəm	улам	'more'	ałʒəm	алим	'apple'
əłʒən	олно	'to find—NPST'	pɔłʒən	болино	'to stop—NPST'
əłʒəŋ	олон	'many'	c <sup>h</sup> ałʒ <sup>j</sup> əŋ	цалин	'salary'
tuułʒəł	дуулал	'song'	t <sup>h</sup> ołʒ <sup>j</sup> əł	толил	'to reflect'
pɔłʒər	болов	'crystal'	tɔłʒər	долир	'cross-eyed'
gałʒəw	галав	'era'	pɔłʒəw	болив	'to stop—PST'
urt <sup>h</sup>	урт	'long'	mɔr <sup>j</sup> h	морът	'mounted'
giřč <sup>h</sup>	герч	'witness'	mɔr <sup>j</sup> č <sup>h</sup>	моръч	'horseman'
aarc <sup>h</sup>	аарц	'curds'	sɔr <sup>j</sup> c <sup>h</sup>	сорьц	'sample'
art	ард	'people'	ur <sup>j</sup> t	урьд	'before'
čurč	жүрж	'orange'	ur <sup>j</sup> č	урьж	'to summon—IPFG'
garc	гарз	'loss'	gar <sup>j</sup> c	гаръз	'latrine'
xarš	харш	'palace'	ur <sup>j</sup> š	урыш	'to get warmer'
tars	дарс	'wine'	sɔr <sup>j</sup> s	соръс	'onion'
curx	зүрх	'heart'			
			ar <sup>j</sup> x <sup>j</sup>	архи	'liquor'
tarəg	дарга	'chief'			
curəg	зураг	'picture'	cɔr <sup>j</sup> əg	зориг	'courage'
turəm	дүрэм	'rule'	xur <sup>j</sup> əm	хурим	'wedding'
tɔrən	дорно	'east'	jar <sup>j</sup> ən	ярина	'speak—NPST'
xurəŋ	хүрэн	'brown'	xar <sup>j</sup> əŋ	харин	'but'

arəłz	арал	'island'	gurjəłz	гурил	'flour'
arəw	арав	'ten'	jarjəw	ярив	'to speak-PST'
			porjəw	борви	'skin bag'
šuwth	шувт	'through'	xawjt <sup>h</sup>	хавът	'to be near'
t <sup>h</sup> ɔwč <sup>h</sup>	төвч	'button'	xawjč <sup>h</sup>	хавъч	'to chatter'
c <sup>h</sup> uwč <sup>h</sup>	цувц	'path'	t <sup>h</sup> awjč <sup>h</sup>	тавъц	'stand'
sowt	сүвд	'pearl'	gɔwjt	говъд	'semi-desert-DAT'
guwč	гувж	'stick at dog's neck'	cawjč	завъж	'corner of the mouth'
nɔwš	новш	'garbage'			
taws	давс	'salt'	xawjs	хавъс	'ribs'
sawx	савх	'chopsticks'	cɔwɔxj	зовхи	'eyelid'
čawəg	чавга	'plum'			
suwəg	суваг	'canal'	t <sup>h</sup> awjəg	тавиг	'offering'
awən	авна	'to take-NPST'	t <sup>h</sup> awjən	тавина	'to put-NPST'
sawəŋ	саван	'soap'	xuwjəŋ	хувин	'bucket'
owəłz	өвөл	'winter'	xuwjəłz	хувил	'to change'
owər	өвөр	'breast'	awjər	авир	'character'
awəw	авав	'to take-PST'	t <sup>h</sup> awjəw	тавив	'to put-PST'
sajt <sup>h</sup>	саят	'millionaire'			
gojč <sup>h</sup>	гоёч	'partiality'			
gojt	гоёд	'elegant-DAT'			
ɔjč	оёж	'to sew-IPFG'			
ajc	аяз	'melody'			
ujs	уес	'time'			
sajx	саях	'recently'			
ajəg	аяга	'cup'			
xujəg	хуяг	'armour'			
ɔjən	оёно	'to sew-NPST'			
nɔjəŋ	ноён	'lord'			
sojəłz	соёл	'culture'			
xɔjər	хоёр	'two'			
ujəw	уяв	'to tie-PST'			

## PROSODY<sup>1</sup>

In this chapter we give a phonological analysis of intonation in Mongolian, and also discuss the problem of word stress. As in other languages, intonation has two major functions: the prominence-lending function, which highlights an important constituent (focus) of the utterance, and the boundary-signalling function, which divides the utterance into smaller groups (prosodic phrases). The tonal gestures associated with the two functions are focal accent and boundary tone, respectively.

We analyse the functionally relevant gestures within autosegmental theory (see e.g. Ladd 1996). The main acoustic correlate of intonation is fundamental frequency, F0. The tonal gestures are abstracted to two distinctive events, Low (L) and High (H), and the tonal courses are regarded as linear sequences of them. The intonational inventory of a language consists of prominence-lending tonal gestures and boundary tones.

The data for this chapter are recordings of the three male Ulaanbaatar speakers BB, DD, and HB (see Chapter 1) and of two female Ulaanbaatar speakers, Sarantuua (ST) and Sarancacral (SC). For the analysis of question intonation, we used recordings of seven Ulaanbaatar speakers, four men and three women. Acoustic analyses and figures showing wave-forms and intonation contours were made in *Praat*.

In this chapter we give a preliminary report of the main facts; a comprehensive analysis will be given in a forthcoming work by one of the authors (AMK).

### 7.1 FOCAL ACCENT

We distinguish two pragmatic types of focus, broad and narrow. A constituent can get narrow focus either by the pragmatic context, or by a lexical focus marker. Broad focus occurs in neutral utterances without narrow focus.

Focal accent was investigated using the material shown in (1) illustrating focusing of different constituents in a short declarative sentence. This material was read by the three male speakers BB, DD, and HB as the answer to different questions (also read by the speakers). When a specific constituent is asked for with a question-word, we regard that constituent as having narrow focus. Thus, there is narrow focus on the first word *aaw* ‘father’ in (1a), and on the second word *jama* ‘goat’ in (1b).

<sup>1</sup> For additional literature on prosody and intonation, see App. G, 7, p.223.

## (1) Material for investigating focal accent in declaratives

- (a) xiiŋ jama xar<sup>j</sup>ʊłžən pee      aaw jama xar<sup>j</sup>ʊłžən  
           who goat herd–NPST Q      father goat herd–NPST  
           Хэн ямаа хариулна бэ?      Аав ямаа хариулна.  
           ‘Who herds goats?’      ‘Father herds goats.’
- (b) aaw juu xar<sup>j</sup>ʊłžən pee      aaw jama xar<sup>j</sup>ʊłžən  
           father what herd–NPST Q      father goat herd–NPST  
           Аав юу хариулна бэ?      Аав ямаа хариулна.  
           ‘What does father herd?’      ‘Father herds goats.’

The intonation contours of the declarative sentences in (1) are shown in Figure 7.1. When the focused word is *aaw*, there is an F0 rise on the long vowel in this word, and when the focused word is *jama* with a short initial vowel, the first vowel has low, and the second one high F0. In both cases, this can be analysed as a LH (low–high) sequence, and in both cases the peak is the highest one in the sentence.

The synchronization of the focal LH tone with the segmental level is best described with a mora analysis. Assuming that Mongolian short and epenthetic vowels are counted as one mora, and that long vowels are counted as two moras,

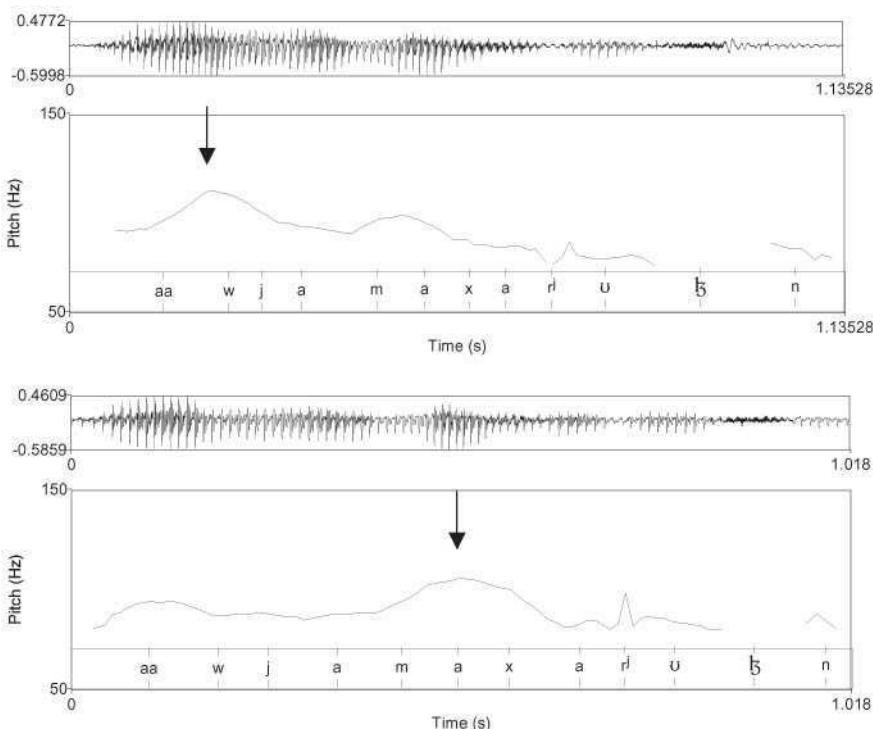


FIGURE 7.1 The utterance *aaw jama xar<sup>j</sup>ʊłžən* ‘Father herds goats’ with focus on *aaw* (top) and on *jama* (bottom). Speaker BB.

the high tone is placed on the second mora of the focused word, and the low tone on its first mora. This pattern is seen in the recordings of all speakers, the only variation being that a long initial vowel in a focused word may have an overall high tone instead of a rise. We regard this as a variant phonetic realization of the narrow focus LH tone, a realization that seems to be more common for male speakers than for women. An example is given in Figure 7.2 (top), which shows the focused word *paaʃara* with a high tone extending over the entire long vowel in the initial syllable. Figure 7.2 (bottom) with the word *paʃprəʃctəgar* illustrates the fact that there is a high tone on the second syllable of a focused word with short initial vowel, even when the second vowel is an epenthetic schwa. These words were said in focused position (before the final verb) in the carrier sentence *pii \_\_\_ gisəŋ* 'I said \_\_\_'.

The peak of the rising tone that signals focal accent tends to be the highest one in the utterance, although this is not always the case. Following syllables can get higher frequencies, and it is the step from lower to higher F0 values, synchronized with the two first moras, which is relevant for signalling focal accent.

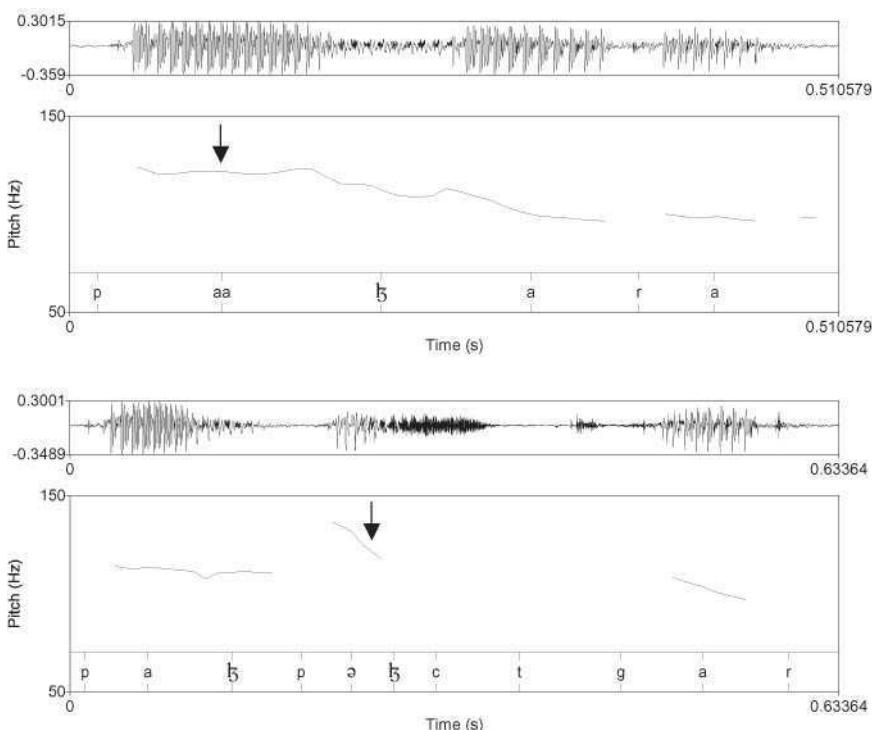


FIGURE 7.2 The focused words *paaʃara* баалаараа 'lap-dog-INST-RFL' (top) and *paʃprəʃctəgar* балбалздагаар 'to shiver-HABITUAL-INST' (bottom) said in a carrier sentence. Speaker DD.

The excursion of the focal rise on a long vowel has approximately the same size as the difference in F0 between the second and the first syllable in words where the first vowel is short. This supports the analysis that the tonal gestures are identical in these two cases, and is a further argument for describing the focal gesture as a LH synchronized with the two first moras of a focused word.

When focus is on the last word of an utterance, usually a verb since Mongolian is a verb-final language, it is not marked with the rising focal accent tone. The last word can be focused by other phonetic means, however, usually by lengthening of the final vowel or sonorant (cf. Poppe 1951a: 14).

The sentence in (2), similar to that in (1) but having longer constituents, shows a more complicated picture since the tonal course reflects grouping of words into prosodic phrases in addition to signalling focus. This utterance can be seen as consisting of three prosodic phrases: *manai aaw* 'our father', *əkəŋ jama* 'many goats', and *uuškar xarjʊšən* 'herds in the mountains'. In this case, the prosodic and syntactic groupings correspond to each other. The focused prosodic phrase has a LH tone with the highest F0 value in the utterance, signalling focal accent (see Figure 7.3). Within each prosodic phrase, the second mora of the first word usually has the highest F0 peak, even if it does not have pragmatic prominence (as *manai* 'our' in the prosodic phrase *manai aaw* 'our father'). This suggests that the F0 rise has another function in addition to focal accenting, namely signalling

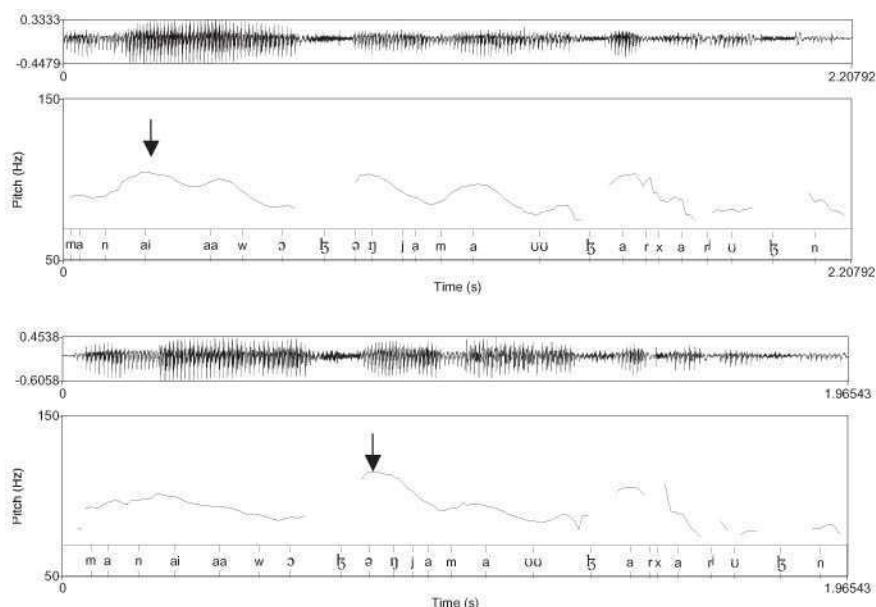


FIGURE 7.3 The sentence *manai aaw əkəŋ jama uuškar xarjʊšən* 'Our father herds many goats in the mountains' with focus on *manai aaw* 'our father' (top), and on *əkəŋ jama* 'many goats' (bottom). Speaker BB.

of a new prosodic phrase, as investigated in more detail in section 7.3.

- (2) manai aaw ək̡əŋ jama uʊłgar xarjʊłčən  
 our father many goat mountain-INST herd-NPST  
 Манай аав олон ямаа уулаар хариулна.  
 ‘Our father herds many goats in the mountains.’

Narrow focus can also be signalled lexically by enclitic focus markers, such as č<sup>h</sup> ч and č<sup>h</sup> ы. This is exemplified in (3).

- (3) (a) inč<sup>h</sup> nəm saiŋ (b) in nəmč<sup>h</sup> saiŋ  
 this-FOCUS book good this book-FOCUS good  
 Энэ ч ном сайн. Энэ ном ч сайн.  
 ‘This book is good.’ ‘This book is good.’

In an utterances with a lexical focus marker, the focused word has an F0 rise as well. This is illustrated in Figure 7.4, where the sentences in (3) are contrasted. In both cases, focus is signalled lexically by the marker č<sup>h</sup> and prosodically by a tonal rise (focal LH). In the second sentence, there are two rising gestures, an initial boundary tone (which we denote with [LH; see 7.3] on *in* ‘this’, and a focal rise LH on *nəm* ‘book’.

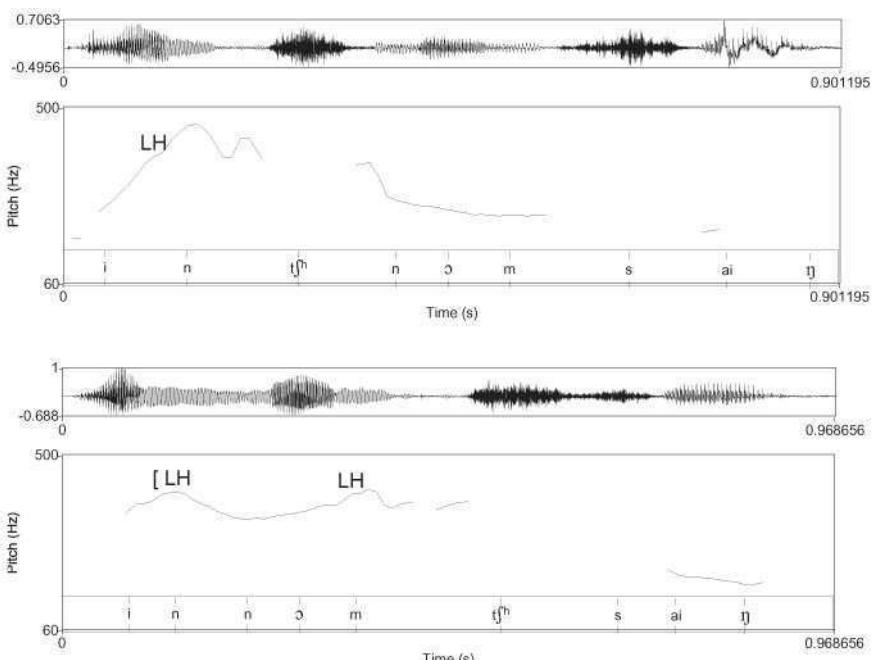


FIGURE 7.4 The utterances *inčʰ nəm saiŋ* ‘This book is good’ (top) and *in nəmčʰ saiŋ* ‘This book is good’. Speaker ST.

## 7.2 FINAL PROMINENCE TONE

A Mongolian utterance often has a tonal downstep to a low pitch which spreads over the rest of the utterance. This occurs in neutral utterances without narrow focus as well as in utterances with narrow focus marked by a focal rise LH. An example is given in Figure 7.5, which shows the intonation contour of the utterance in (4).

- (4) *t<sup>h</sup>ir oor xuuxən<sup>h</sup>e t<sup>h</sup>an<sup>j</sup>əl<sup>h</sup>ç<sup>h</sup>sənar parəxgui, t<sup>h</sup>uunt<sup>h</sup>e suusəŋ*  
 he other woman-COM get.to.know-PSTP-INST not.only, she-COM  
*suusəŋ*  
 marry-PSTP  
 Тэр өөр хүүхэнтэй танилцсанаар барахгүй, түүнтэй суусан.  
 'Not only did he get to know another woman, he even married her.'

The second part of this utterance, *t<sup>h</sup>uunt<sup>h</sup>e suusəŋ* '[he] married her', is pronounced with low F0 (below 200 Hz for this female speaker). This part of the utterance is semantically and pragmatically important, so the low tone cannot be regarded as signalling deaccentuation. We analyse it as a prominence signalling gesture, a low tone (L) that spreads over the final part of an utterance, often a long constituent which is semantically important.

This low prominence tone is very common. The step from the previous part of the utterance can be as much as 200 Hz for female speakers, which is perceptually very salient.

We believe that the existence of this prominence tone is related to the information structure and syntactic structure of Mongolian. Being a strictly verb-final language with SOV (subject–object–verb) word order, Mongolian tends to place the rheme at the end of an utterance. The final verb is pragmatically important, and the position before the final verb is the syntactic focus position, as in Turkish and Hungarian, so that a constituent can be focused by moving it to this position. We hypothesize that the low tone is a default device for marking the rheme of a sen-

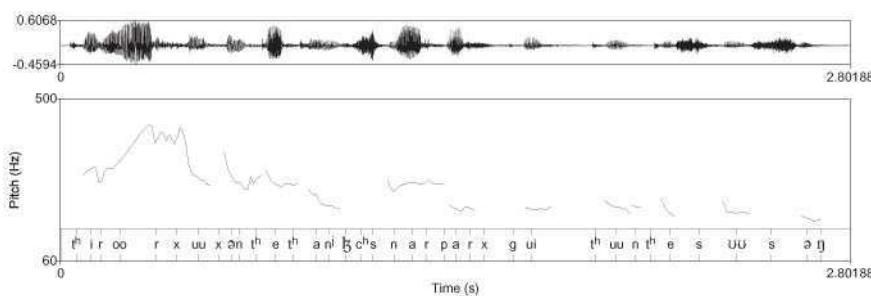


FIGURE 7.5 The utterance *t<sup>h</sup>ir oor xuuxən<sup>h</sup>e t<sup>h</sup>an<sup>j</sup>əl<sup>h</sup>ç<sup>h</sup>sənar parəxgui, t<sup>h</sup>uunt<sup>h</sup>e suusəŋ* 'Not only did he get to know another woman, he even married her'. Speaker ST.

tence, used when other types of final focus marking are not employed. The fact that the final verb cannot get the focal rise LH supports this interpretation.

### 7.3 BOUNDARY SIGNALLING

Long utterances are often divided into two or more prosodic phrases, entities with prosodically defined boundaries. This was investigated using material recorded with the two female Ulaanbaatar speakers ST and SC. Most utterances have an F0 rise (analysed as a low–high sequence) on the initial word, but occasionally the peak of the rise occurs on the following word, if the first word is monosyllabic (e.g. a personal pronoun like *pii* ‘I’). The rising gesture is also found non-initially in longer utterances and is often placed on semantically unimportant words. One example is the sentence in (5), whose intonation contour is shown in Figure 7.6.

- (5) *pii in t<sup>h</sup>aʃar ɔk̡əŋ xənəg xooch<sup>h</sup>ək̡tsəŋ pɔk̡əw<sup>h</sup>, t<sup>h</sup>itnər is  
I this matter–INST many day pursue–PSTP although, they not  
cowšorəw agree–PST*  
Би энэ талаар олон хоног хөөцөлдсөн боловч, тэд нар эс зөвшөөрөв.  
'Although I worked on this matter diligently for many days, they did not  
agree.'

Three tonal rises can be observed. Two of them are placed on function words, the pronouns *pii* ‘I’ and *t<sup>h</sup>itnər* ‘they’. We analyse these gestures as non-prominence related phrase-initial boundary tones represented as [LH]. There is a third rising tone between these two, placed on the semantically important word *ɔk̡əŋ* ‘many’. This rise signals a focal accent (LH). It is followed by the low prominence tone L. The F0 rise thus has two different functions, signalling a prosodic boundary, [LH], or signalling narrow focus, LH. This is illustrated clearly in Figure 7.4, where narrow focus is marked explicitly with the marker *č<sup>h</sup>*. In the sentence *inč<sup>h</sup> nəm sain* ‘This book is good’ with focus on *in* ‘this’, there is only one rising tone, signalling

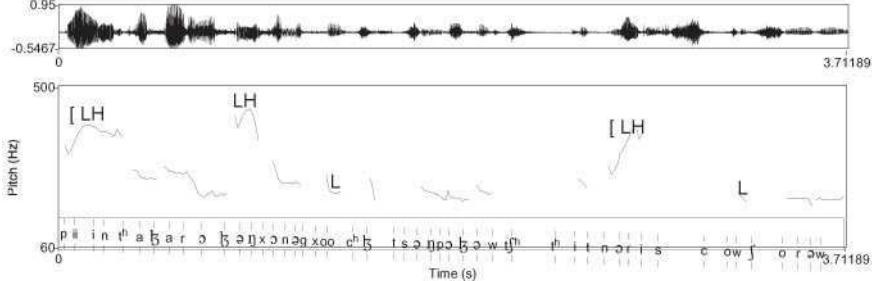


FIGURE 7.6 The sentence *pii in t<sup>h</sup>aʃar ɔk̡əŋ xənəg xooch<sup>h</sup>ək̡tsəŋ pɔk̡əw<sup>h</sup>, t<sup>h</sup>itnər is cowšorəw 'Although I worked on this matter diligently for many days, they did not agree'*. Speaker ST.

both focus and boundary, but in the sentence *in nɔmč̥h saiŋ* ‘This book is good’, with focus on *nɔm* ‘book’, these functions are separated, the rise on *in* signalling boundary, and the rise on *nɔm* signalling focus.

In subordinate clauses, boundary signalling may occur phrase-finally as well, placed on postposed conjunctions. We represent this as an optional phrase-final boundary tone LH]. This is illustrated in Figure 7.7 which shows the intonation contour of the sentence in (6).

- (6) pilȝet<sup>h</sup> tuussəŋ uč̥ras, pii kinɔ ucsəŋgui  
 ticket finish–PSTP because, I film see–PSTP–NEGATION  
 Билет дууссан учраас, би кино үзсэнгүй.  
 ‘Since the tickets were sold out, I did not see the film.’

This utterance is divided into two prosodic phrases: *pilȝet<sup>h</sup> tuussəŋ uč̥ras* ‘since the tickets were sold out’ and *pii kinɔ ucsəŋgui* ‘I did not see the film’. The first phrase is signalled by an initial boundary tone [LH on *pilȝet<sup>h</sup>*, which also has a focal function here. At the end of the phrase there is a final boundary tone LH] on *uč̥ras*. The next phrase is signalled by an initial [LH boundary tone on *pii*. The expected final low prominence tone is replaced by a focal rise in this sentence, realized on the negation *-gui*, which optionally can take the focal rise, unlike sentence-final verbs. Like the fact that this suffix does not follow vowel harmony (5.2.3), this is an indication that the negation is not a suffix but a compound-forming element.

Relatively small pitch rises sometimes occur on non-initial and non-focused constituents of a prosodic phrase within longer utterances. An example is the sentence *manai aaw ɔžəŋ jama uužar xar<sup>j</sup>užən* ‘Our father herds many goats in the mountains’ (2). The focal accents LH and boundary tones [LH are realized on the initial words *manai* and *ɔžəŋ* of the prosodic phrases *manai aaw* ‘our father’ and *ɔžəŋ jama* ‘many goats’ (Figure 7.3), but the non-initial words *aaw* ‘father’ and *jama* ‘goat’ have small rising F0 gestures. Like the focal accent and boundary tone, they are aligned with the two first moras, and may have the function of signalling word boundaries.

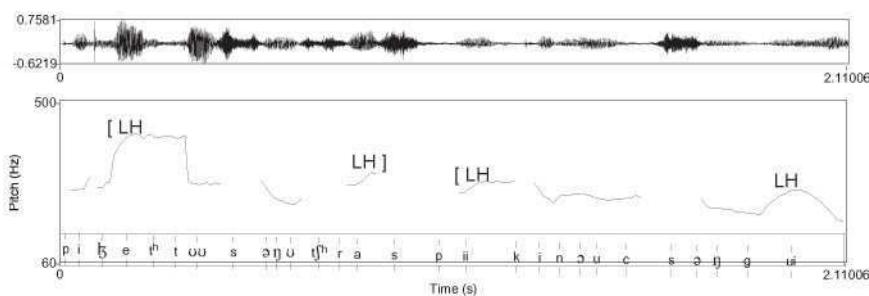


FIGURE 7.7 The sentence *pilȝet<sup>h</sup> tuussəŋ uč̥ras, pii kinɔ ucsəŋgui* ‘Since the tickets were sold out, I did not see the film’. Speaker ST.

In conclusion, the division of an utterance into prosodic phrases is normally signalled by an initial boundary tone [LH. This gesture is perceptually salient, having an excursion up to 150 Hz for female speakers, giving a very characteristic melody to Mongolian declaratives. Utterance-internal prosodic phrases can be signalled by an optional final rise LH] as well.

## 7.4 QUESTIONS<sup>2</sup>

Mongolian has strong formal markers for questions. Yes–no questions have an obligatory sentence-final question marker  $-(j)U$  which is cliticized to the final word of the sentence (for an example, see (7a)). It is written as a separate word *yy/yoj/yoj* in Cyrillic Mongolian; the vowel follows vowel harmony, and *j* is added if the preceding word ends in a vowel. Question-word questions have a sentence-final marker *peel/wee бэ/вэ* in addition to the question-word, but it can be omitted in colloquial speech. Question-words are not moved to the sentence-initial position (see the examples in (1) above).

The focused words in yes–no questions and question-word questions are signalled by the same tonal gesture, so we will treat them together. For analysing question intonation we used recordings of seven Ulaanbaatar speakers, four men and three women. The focused word is signalled by a focal rising tone (LH), and a question-word is always focused. The phonetic realization of the focal rise in questions is a bit different from its realization in declaratives. If a word has a short vowel in the initial syllable, and contains a non-initial diphthong, or ends in a vowel, the rise is not synchronized with the two first moras, but is realized on the diphthong or final vowel. In other cases, the focal rise is realized as in declaratives. This is illustrated in Figure 7.8, where the question *tʰir tɔrčij pagšu?* ‘Is he Dorj’s teacher?’ is compared with the declarative sentence *tʰir tɔrčij tiwtʰər* ‘This is Dorj’s notebook’ (7). In both cases, the focused word *tɔrčij* ‘Dorj’s’ is signalled by a tonal rise synchronized with the two moras in the word.

- |                                  |                              |
|----------------------------------|------------------------------|
| (7) (a) <i>tʰir tɔrčij pagšu</i> | (b) <i>in tɔrčij tiwtʰər</i> |
| he Dorj-GEN teacher-Q            | this Dorj-GEN notebook       |
| Тэр Доржийн багш уу?             | Энэ Доржийн дэвтэр.          |
| ‘Is he Dorj’s teacher?’          | ‘This is Dorj’s notebook.’   |

The question marker  $-(j)U$  is cliticized to the final word of the yes–no question, and can occupy the second mora position in the resulting cliticized word. For example, the word *ucəg* үзэг ‘pen’ becomes *ucgu* үзэг *yy* (formed by the syllabification rule (6) in 6.2) when the question marker has been attached to it, with the marker forming the second mora. In consequence with this, the high tone of the focal LH gesture is aligned with the question marker in the sentence *tʰir ucgu?* ‘Is that a pen?’

<sup>2</sup> Bjuraeva and Pavlova (1976); Mohosoeva (1978; 1979; 1981; 1983; 1984); Esenova and Mandžieva (1986); Žargalov (1986; 1987a, b; 1988); Karlsson (2003a).

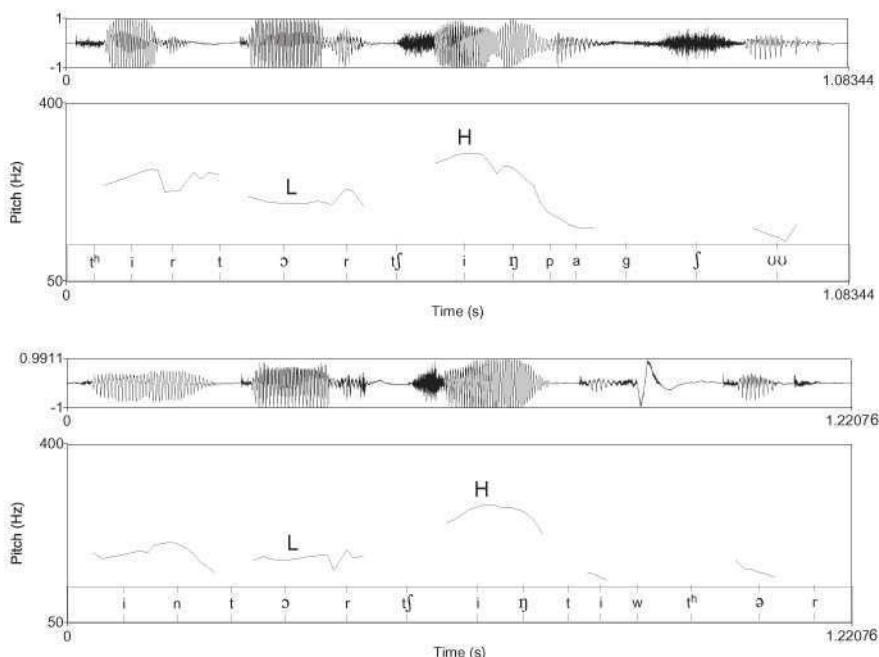


FIGURE 7.8 The question *tʰir tɔrčiŋ pagšu?* ‘Is he Dorj’s teacher?’ (top) and the declarative *in tɔrčiŋ tiwtʰər* ‘It is Dorj’s notebook’ (bottom). Speaker E.

(Figure 7.9). In the question *in šireju?* ‘Is this a table?’, the second mora coincides with the second vowel in the word *šire* ‘table’, and consequently the high tone is aligned with that vowel.

The final marker in both types of questions can get a tonal rise, analysed as a final boundary tone LH]. This final rise is used systematically by two of our seven speakers (see Fig. 7.10 for an example).

Another feature which is characteristic for questions (at least for those with up to five words), is that they contain no pauses. In declaratives, pauses are relatively frequent, especially between the theme and the rheme (often the subject and the predicate phrase), and in complex sentences between the clauses.

## 7.5 WORD STRESS<sup>3</sup>

In languages with contrastive stress, word stress is usually signalled by a combination of phonetic correlates, including fundamental frequency (F0), duration, and vowel quality. Intensity may be involved as well.

<sup>3</sup> For sources and notes on word stress, see App. G, 7.5, p. 223.

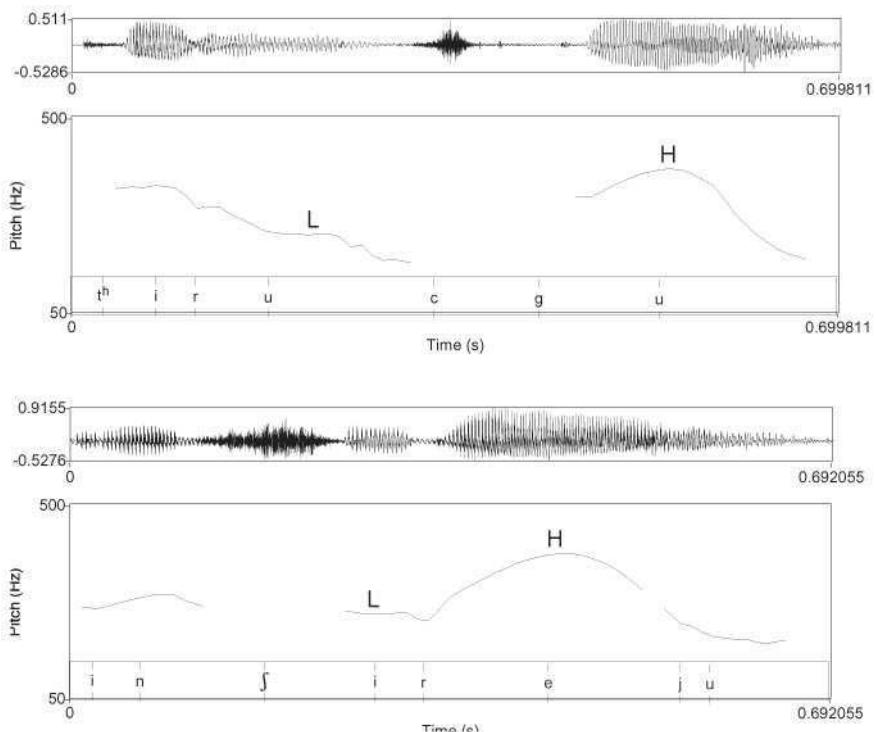


FIGURE 7.9 The yes–no questions *t̪ʰir ucgū?* Тэр үзэг ўу? ‘Is that a pen?’ (top) and *in ſt̪irju?* Энэ ширжүү? ‘Is this a table?’ (bottom). Speaker ST.

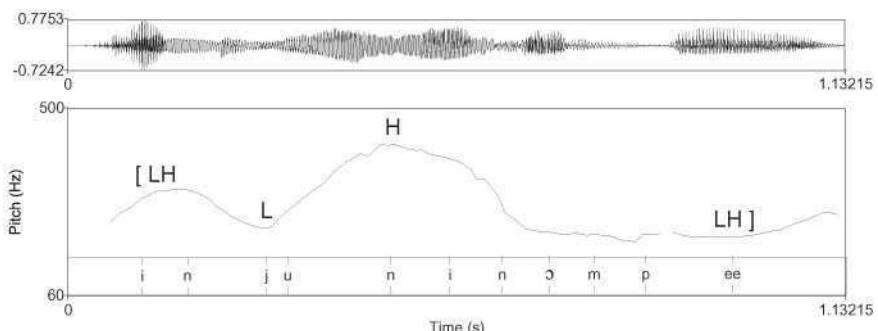


FIGURE 7.10 The question *in juni nom pee?* Энэ юуны ном бэ? [this what book Q] ‘What kind of book is this?’ Speaker ST.

We have shown earlier in this chapter that fundamental frequency is used for signalling prominence and boundaries on the prosodic phrase level, but it has little, if any, relevance on the word level.

Vowel duration and vowel quality were both investigated in section 1.1. Their main function is paradigmatic, distinguishing long and short vowels in initial syllables and distinguishing phonemic and epenthetic vowels in non-initial syllables. None of these phonetic properties gives prominence to any particular syllable position in a word, since long vowels occur only in the initial syllable, and the qualities of initial and non-initial short vowels are approximately the same, as is their duration, although non-initial short vowels are slightly longer than initial short vowels. Thus both vowel quality and duration depends on the phonological status of the vowel and not on its position in relation to a stressed syllable, as is the case in languages, such as Russian or English, which have reduction of unstressed vowels.

The initial vowel is phonologically strong due to its decisive role in vowel harmony. Because of vowel harmony, and because long and short vowels contrast only in initial syllables, the number of contrasting vowels is very much larger in initial than in non-initial syllables. This may be interpreted as giving phonological prominence to the initial syllable, making it a plausible candidate for carrying stress. This is not supported by the data on F0, duration, and vowel quality, however. In our spoken material, there are several cases of almost complete reduction of word-initial vowels, which is not compatible with the view that this vowel is stressed.

Our conclusion is that word stress is not phonologically relevant in Mongolian. The different phonetic properties which signal a stressed syllable in other languages, especially in languages with contrastive stress, have different functions in Mongolian and do not converge to form a unified phenomenon of word stress in this language.

One indication that this view is the correct one is that there are widely differing opinions on the place and nature of word stress in Mongolian which have been expressed in the literature. The only consensus is that stress is not contrastive, so that no two words can be distinguished only by the place of stress. On the other hand, it is usually taken for granted that there is stress of some kind, but different authors disagree about the place of the stressed syllable in a word. In our opinion this is a spurious question, but we will nevertheless review the literature dealing with it briefly. There are at least six different opinions about the place of Mongolian stress in the literature:

- (1) Stress falls on the first syllable. This is the opinion of almost all native Mongolian scholars who wrote on this subject, and it is shared by many other Mongolists who describe Mongolian proper or Buriad.<sup>4</sup> According to Cenggeltei

<sup>4</sup> Schmidt (1831: 14); Ramstedt (1902: 50); Rudnev (1905; 1911; 1913–14: XXXI); Kljukin (1926); Vladimirov (1929: 64, 97); Poppe (1931; 1936: 8; 1937: 18; 1938: 62); Grønbæch (1940); Todaeva (1951: 40); Sanžeev (1959: 20); Cenggeltei (1959; 1979a: 98); Luvsanvandan (1966b; 1980b); Coloo (1973b; 1976: 153); Möömöö (1974); Qaserdeni et al. (1996: 122).

(1959), Baarin Mongolian has stress on the first syllable, realized as low tone.

Several of these authors, including Ramstedt (1902), Vladimircov (1929), Poppe (1931: 9), and Coloo (1973b), say that there is a secondary stress (often described as musical or tonal) on the last syllable. Zolhoev (1962) says that Buriad word stress falls on the first syllable, and phrase stress on the last syllable of the first word of a phrase. Bitkeev (1980) says that the first syllable has relatively long duration and the last syllable has high pitch in Kalmuck.

- (2) If the first vowel is long (or a diphthong) or if it is the only phonemic vowel, it carries the stress. If the first vowel is short and there are other phonemic vowels in the word, the first of these carries the stress. Under the traditional vowel analysis (a) in section 3.1.1 (our phonemic non-initial vowels are long, epenthetic vowels are phonemic and short), this can be expressed as: stress falls on the first syllable which contains a long vowel or diphthong; if there are no long vowels, stress falls on the first syllable.<sup>5</sup>
- (3) The same as (2) with the modification that stress falls on the penultimate phonemic vowel if there are two or more phonemic vowels in non-initial syllables (Bosson 1964: 21; Poppe 1970; Walker 1995; 1996). For example, opinion (3) places stress on the penultimate syllable in words like [šagšur'ara] *marmypaapaa* 'biscuit-stick–INST–RFL', while opinion (2) puts the stress on the antepenultimate: [šag'šurara].
- (4) Stress falls on the final syllable. A. A. Bobrovnikov (1849: 33) says that stress, realized as a pitch rise, always falls on the last syllable in Mongolian. Orlov (1878) makes the same assertion about Buriad. Pozdneev (1879: 179) and Cybikov (1915: 7) say that most words are stressed on the final syllable. According to Yi (1964; 1991), Mongolian loans in sixteenth-century Korean always have a high tone mark on the final syllable.
- (5) Stress falls on the final syllable, but if the word contains a long vowel or diphthong, it takes the stress. This view is held by A. I. Bobrovnikov (1835) and Kowalewski (1835).
- (6) Stress falls on the initial syllable if its vowel is long; and if it is short, stress falls on the second syllable (Köke 2003a, b).

The reason for this situation is apparently that different criteria and different phonetic correlates have been used for defining stress. Several investigators have come to the conclusion that stress is difficult to define or that there are several kinds of stress: Cybikov (1908: 5); Zolhoev (1961; 1970); Gerasimovič (1970; 1975); Bitkeev (1980); Svantesson (1990; 1992). In our opinion, word stress is not a relevant concept in Mongolian phonology, and any definition of it must be arbitrary, depending on the individual investigator's choice of criteria.

<sup>5</sup> This is the opinion of Sturt (1941: 4), Aberle and Austin (1951), Hattori (1951), Poppe (1951a: 13; 1960a: 143), Stuart and Haltod (1957: 68), Street (1963: 62), Beffa and Hamayon (1975), etc. This view has been adopted in several theory-oriented works using Mongolian data, e.g. Hyman (1977: 52); Odden (1979: 158); Prince (1983: 75ff.); Hayes (1985: 63f.); Hammond (1986: 196ff.); Halle and Vergnaud (1987: 71f.); Goldsmith (1990: 187f.); Kenstowicz (1994: 582, 607); Halle and Idsardi (1995: 413f.); Ahn (1999: 21f.).

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## OLD MONGOLIAN

Four different scripts, Uigur, Chinese, Arabic, and 'Phags-pa, were used for writing Mongolian in the thirteenth to the fifteenth centuries. We use the term Old Mongolian for the immediate ancestor language that can be reconstructed from these four kinds of sources. The language of the Uigur script documents differs somewhat from the language of the other three sources, which is known as Middle Mongolian (Vladimirov 1929: 47; Poppe 1955: 15). The languages of the Chinese (Sino-Mongolian) and 'Phags-pa Mongolian sources are more or less identical, while Arabic Mongolian (sometimes called Western Middle Mongolian) has some divergent features that remind us of modern Oirad. In addition to these four main sources for Old Mongolian, some Mongolian words can be found in Armenian, Georgian, Korean, and other texts, but they are of less importance for Mongolic historical phonology. There is a large secondary literature about the oldest Mongolian texts, most of which have been published in a form that makes them available for non-specialists in Mongolian palaeography. We have benefited greatly from these publications; references are given in the relevant places.

Uigur Mongolian preserves Old Mongolian medial *\*h*, which is not shown in the three other scripts. On the other hand, they preserve initial *\*h*, not written in Uigur Mongolian. Thus, both Uigur Mongolian and Middle Mongolian have lost some archaic features and have retained others. For this reason, and also because the oldest texts in Uigur Mongolian and Middle Mongolian are almost contemporaneous, it is not possible to assume a linear development from Uigur Mongolian via Middle Mongolian to the modern languages (Doerfer 1964a: 37; Weiers 1970b; de Rachewiltz 1999). The sources probably write different dialects, which have developed in different ways from the ancestor language (cf. Poppe 1960a: 2f.). We will avoid the rather misleading term Middle Mongolian.

Reconstructions of a Mongolian ancestor language are given explicitly or implicitly by Poppe (1955; 1960a; 1965; 1976), Ramstedt (1957), Clauson (1962), Tömörtoogoo (1992), Darbeeva (1996), and others. These reconstructions are mainly based on the traditional transcription of Written Mongolian, which partly relies on the modern Mongolian pronunciation (see 4.3). In addition, initial *\*h* (or an equivalent consonant) is reconstructed in the appropriate words, using the 'Middle Mongolian' sources. In our opinion, the bias towards Uigur Mongolian and modern Halkh makes these reconstructions somewhat inappropriate as the point of departure for describing the development of the modern languages. Since a reconstruction of Proto-Mongolic, using all the modern and ancient sources, is still premature, we have chosen to work with the four kinds of thirteenth to fif-

teenth century Mongolian texts, and reconstruct Old Mongolian only from them. The resulting reconstruction is, however, not very different from the others, and many of the differences that do occur are due to different analyses rather than to the choice of sources.

Although Old Mongolian as defined here is not identical to Proto-Mongolic, it is very close to it, and Old Mongolian is taken as the point of departure when we describe the development to the modern languages in Chapter 10. Old Mongolian has the advantage of being clearly defined in a way that is independent of the modern languages. Furthermore, it reflects the language of Chinggis Khan's time, or somewhat earlier; it seems that the language became unified at this time, when the Mongolian state and the Mongolian written language were created (Janhunen 1998). On the other hand, Proto-Mongolic may have had properties which are not reflected in Old Mongolian, but are reflected in some modern Mongolic languages. Such properties seem to be few and difficult to reconstruct. The existence of long vowels may be an example (see 8.5.1).

Words from the sources for Old Mongolian are given in a strict transliteration of the graphemes, using different letters only when the writing system uses different graphic symbols. For example, unlike the traditional transcription of Written Mongolian, we always transliterate the Uigur Mongolian letter 𠩎 as *u*, although it did denote two different Old Mongolian vowel phonemes, \**u* and \**o*. When talking about the Uigur Mongolian vowel system, for example, we mean the system implied by the vowel letters (graphemes), not the actual vowel phoneme system used by the speakers who wrote their language with the Uigur Mongolian script. Arabic Mongolian and 'Phags-pa Mongolian are transliterated by the same principles, whereas the non-alphabetic character of the Chinese script requires another solution for Sino-Mongolian (see 8.2).

The Old Mongolian sources tell us nothing about prosodic features such as stress or intonation, moreover, and the information on this is inadequate for most modern languages, so we will not speculate about this subject.

All reconstructed Old Mongolian forms used in this book are given in section 8.9 together with their sources.

## 8.1 UIGUR MONGOLIAN

The Uigur Mongolian alphabet is an adaptation of the script used by the Turkic Uigurs in Central Asia from the ninth to the sixteenth centuries. The Uigurs had borrowed it from the Sogdians, an Iranian people, who had in their turn taken it from Syrian. According to Chapter 124 of the *History of the Yuan dynasty* (*Yuan shi*), compiled in 1370–1 by Song Lian and others, the Uigur Mongolian script originated when Tatatong'a, an Uigur official who knew the written Uigur language well, was captured by the Mongols from the Naiman Khan in 1204 and was ordered to teach the princes how to use the Uigur alphabet for writing the Mongolian language (*Yuan shi*, vol. 10, pp. 3048–9 in the 1976 Beijing ed.). The Uigur script was

originally written from right to left in rows, like other scripts of Semitic origin, but probably under Chinese influence it was rotated 90° counter-clockwise, resulting in columns following each other from left to right. This way of writing was inherited by the Mongols.

The term Uigur Mongolian (UM) is used here for the oldest texts written in the Uigur Mongolian script during approximately the thirteenth to the fifteenth centuries, corresponding to the first stage of Pre-classical Mongolian in Weiers (1969). A criterion which may be used for identifying texts as belonging to this stage of the language is the use of the letter <q> 𩫑 / 𩫒 before <i> 𩫓 in back-vocalic words (Poppe 1975a; Higuchi 1999: 67ff.). Later texts will be referred to as (Classical or Modern) Written Mongolian (cf. 4.3).

The earliest extant inscription, known as *Chinggis Khan's stone*, is probably from 1227. The corpus of Uigur Mongolian texts is not very large. We have used mainly the collection by Dobo (1983b) in which the texts are reproduced in facsimile, copied and transcribed in Modern Written Mongolian, and provided with comments.

The Uigur Mongolian alphabet is shown in (1). Comparison with Table 4.2 shows that, except for the forms of the letters, the Modern Written Mongolian alphabet differs from Uigur Mongolian only by the introduction of letters with diacritic dots (𩕤 / 𩕥 <n> and 𩕧 / 𩕨 <g>) and a few modified letters (𩕩 <c> and 𩕪 <y>) in order to differentiate previously homographic sounds.

### (1) The Uigur Mongolian alphabet

<i>Uigur</i>	<i>Modern</i>	<i>Uigur</i>	<i>Modern</i>
𩕠	a	𩕡	t
𩕢	e	𩕣	d
𩕤	i	𩕥	l
𩕦	u	𩕧	m
𩕨	y	𩕩	č
𩕩	n	𩕪	j
𩕪	q	𩕩	k
𩕩	b	𩕩	r
𩕩	s	𩕩	w
𩕩	z		

*Note:* The table shows the Uigur forms and the corresponding Modern Written Mongolian forms of the letters at the beginning of a word, in the middle, and at the end.

Uigur Mongolian forms will be given here in strict transliteration, as shown in (1), and not in the traditional transcription (see 4.3). We use the IPA transcription y for the front high rounded vowel, usually written ü in the Mongolist literature.

Because of the similarities of several letters, there are frequent ambiguities in Uigur Mongolian, and even letter-for-letter transliteration involves a certain amount of interpretation. For just one example, the graphic word 𩕩 can, in

theory, be transliterated in at least five ways: <aqa> (አፏ), <anan> (አናኑ), <naqa> (ናፏ), <nanan> (ናናናና), or <enana> (እናናና). Although the transliteration used here involves interpretation, it is reversible in the sense that the original spelling can be retrieved from it.

In most Uigur Mongolian texts, no diacritic dot is written on the letter  $\langle n \rangle$  ( $\text{ນ}/\text{ນ}$ ) to distinguish it from the vowel  $\langle a/e \rangle$ . When the ‘dotted *n*’ ( $\text{ݧ}/\text{ݧ}$ ) appears, we transliterate it as  $\langle \dot{n} \rangle$ . The letter  $\text{ݧ}$  ( $\text{ݧ}$ ) with two diacritic dots is used in a few Uigur Mongolian texts; we transliterate it as  $\langle \ddot{q} \rangle$ . In Modern Written Mongolian, the two dots indicate that the stop is unaspirated, but they seem to have no systematic meaning in the Uigur Mongolian texts. In word-final position, the sound *s* is often written as  $\text{ᡲ}$ , transliterated  $\langle z \rangle$ . A few Uigur Mongolian texts have the letter  $\text{ᡲ}$  ( $\text{ᡲ}$ )  $\langle \check{s} \rangle$ . The Uigur Mongolian grapheme system is shown in (2).

(2)	i	y	u	b	t/d	č	k	q
	e		a		s/z			
				m	n			
					l			
					r			
				w		j		

As in Modern Written Mongolian, Uigur Mongolian has five vowel letters. The script distinguishes between *e* and *a* only in word-initial position, and we will use <*e*> only for transliterating the word-initial letter ئ, contrasting with ئ <*a*>. The medial/final vowel letter ئ / ئ is always transliterated as <*a*>. The vowel symbol ئ ئ <*y*> occurs only in initial syllables, so only the three vowels <*i*, *a*, *u*> occur in the transliteration of non-initial syllables, although we reconstruct non-initial \**e*, \**y* as well for Old Mongolian. For example, the Uigur Mongolian words written ئەسۇن 'grass', ئەل 'tongue', and ئىچىن 'ice' are transliterated <*ebasun*>, <*kala*>, <*mylsun*> (the traditional transcriptions of these words are *ebesün*, *kele*, *mölsün*, and we reconstruct them as \**epesyn*, \**k<sup>h</sup>ele*, \**mølsyn* in Old Mongolian). When ئ / ئ <*i*> occurs between two vowels, we interpret it as a glide <*j*>: ئەسەن <*sajin*> 'good', ئەبەجىڭ ئ <*baj-a*> 'body'.

Only one series of stops/affricates is written in Uigur Mongolian. The letters **Ϙ** (**ϙ**, **ϙ'**) and **ϙ** usually occur in disjoint environments in Modern Written Mongolian, so that **ϙ** is written medially before a vowel, and **Ϙ** in all other positions. In the Uigur Mongolian texts, there are a few exceptions to this, and we transliterate **Ϙ** as <t> and **ϙ** as <d>, although this probably does not correspond to a real sound contrast.

In some words, final *a* is written separately from the rest of the word (cf. 4.3). In the transcription this is shown with a hyphen <->: **قارا** *qar-a* ‘black’. If they are relevant, morpheme boundaries are shown with a dash <->: **جابو-قا** *jabu-qu* ‘to go-FUTP’. Uigur Mongolian does not indicate morpheme boundaries within words, except for case and reflexive suffixes which are written separately from the stem. We use a long dash <—> to denote the combined graphic and morpheme boundary: **كىل-ئىجان** *kyl—ijan* ‘foot-RFL’.

## 8.2 SINO-MONGOLIAN<sup>1</sup>

The oldest literary text in Mongolian is the *Secret history of the Mongols*. This is preserved only as a text where the Mongolian language is written with Chinese characters, but most scholars assume that the original was written in the Uigur script. According to de Rachewiltz (1965), the main part of the text (sections 1 to 268), dealing with Chinggis Khan's life and known as *Cinggis qagan-u ijagur* 'The origin of Chinggis Khan', was written in the Uigur script in 1228, and the remaining fourteen sections of the book were written after 1258. The transcription with Chinese characters was probably made in the 1390s (de Rachewiltz 1965: 204).

The Chinese–Mongolian glossary *Hua–Yi yiyu* 'Chinese–Foreign glossary' from 1389 is another source for Mongolian words transcribed with Chinese characters, basically in the same way as in the *Secret history*. There are also some other Sino-Mongolian glossaries of a similar type.

Words from the *Secret history* are cited from the edition by Kuribayashi and Coyijongjab (2001), which contains a reproduction of the standard *Si bu congkan* Chinese text, a transliterated text, and a complete word index. Forms from *Hua–Yi yiyu* are cited from Kuribayashi (2003).

Examples are given here in Chinese characters and in a transcription based on the Yuan dynasty northern Chinese pronunciation reconstructed as Early Mandarin by Pulleyblank (1984; 1991). This reconstruction is based on the *Zhongyuan yinyun* 'Pronunciation of the Central Plain' written about 1324 by Zhou Deqing.

All Chinese characters occurring in examples cited in this book are listed in Table 8.1 together with their Yuan Chinese and Sino-Mongolian readings. Because each Chinese character represents a monosyllabic morpheme, only those syllables which occur in Chinese can be written with Chinese characters. As shown below, a number of devices are used in Sino-Mongolian to represent non-Chinese sounds.

### 8.2.1 Sino-Mongolian consonants

The system of onset consonants that can be inferred from the Sino-Mongolian transcriptions is shown in (3).

(3)	t <sup>h</sup>	č <sup>h</sup>	k <sup>h</sup>
p	t	č	k
	s	š	x
m	n		χ
	l		
r			
	j		

<sup>1</sup> For notes on Sino-Mongolian, see App. H, 8.2, p. 223.

TABLE 8.1 Sino-Mongolian transcriptions

The table shows all Chinese characters used in examples in this book, and some additional ones to complete the system. The Yuan Chinese reconstructed pronunciation is shown inside the table, and the Sino-Mongolian interpretation can be read from the row and column headings. For example, the character 鵠 has the YCh pronunciation *pɔw*, interpreted as SM *paw*.

	a	am	an	aŋ	aj	aw
-	阿 ɔ	唵 am	安 an	昂 aŋ	埃 aj	奥 aw
p	巴把八 pa		班 pan	邦 paj	伯 paj	鵠保 pɔw
m	麻馬 ma		蠻 man	莽忙 maj	埋 maj	卯 maw
t	苔 ta		丹 tan	當 tan	歹 taj	擣 taw
tʰ	塔榻 tʰa	探 tʰam	壇 tʰan	堂 tʰaŋ	臺 tʰaj	討 tʰaw
s	撒 sa	麌三 sam	散 san	桑 saŋ	賽 saj	掃 saw
n	納 na	南 nam	難 nan		乃 naj	
l	刺 la	藍 lam	闌 lan	郎 laŋ	來 laj	老 law
č	札 tṣa	站 tṣam	蓋 tṣan	掌 tṣaŋ	澤 tṣaj	
čʰ	察 tṣʰa	攬 tṣʰam	潺 tṣʰan	昌 tṣʰaŋ		抄 tṣʰaw
š	沙 ſa				篩 ſaj	
k	歌 kɔ	敢 kam	干 kan		該 kaj	
kʰ	可 kʰɔ	坎 kʰam	刊 kʰan	康 kʰaŋ		
x	合哈 xo	含 xam	罕 xan	杭 xɑŋ	孩 xaj	好 xaw
j	牙迓 ja	黯 jam	顏 jan	陽 jaŋ		
w	瓦 wa					
	e	em	en	eŋ	ej	ew
-	額 jaj	奄 jem	延 jen			
p	別 pje		邊 pjən			
m	篾 mje		綿 mjen			
t	迭咥 tje	點 tjem	顛 tjen	登 təŋ	德 tej	
tʰ	帖 tʰje	忝 tʰjem	田 tʰjen	騰 tʰəŋ		挑 tʰjew
s	薛 sjε		先 sjen	僧 səŋ		嘯 sjew
				想 sjəŋ		
n	捏涅 nje	粘 njem	年 njen	能 nəŋ		耨 nəw
l	列 lje	廉 ljem	連 ljen	良 ljaŋ		
č	折 tṣe	詹 tṣem	氈 tṣen			勺 tṣew
čʰ	者 tṣia					
	扯徹 tṣʰε		禪 tṣʰen			超 tṣʰew
			淺 tṣʰian			
k	格 kjaj	兼 kjem	堅 kjen			鉤 kəw
kʰ	客 kʰjaj		虔 kʰjen		克 kʰəj	
x	協 xje					
	赫 xjaj					
j	也耶 je					

TABLE 8.1 (*cont.*)

	o	on	oŋ	oj	ow
-	斡 wo	完 on		汪 waŋ	
p	孛 po				
m	抹抹沫 mo				
t	朵多 to	端 ton			
tb	脫 tbɔ	團 tbɔn			
s	莎 so				
n	那 no				
l	羅 lo	樂 lon			
č			莊 tʃwaŋ		卓 tʃwaw
š			率 ſwaj		搠 ſwaw
k	戈 kwo	官 kɔn			
k		關 kwan			
kʰ	闊科 kʰwo	寬 kʰɔn	匡 kʰwaŋ		
x	豁 xwo	桓 xɔn	晃 xwaŋ	槐 xwaj	
j	約 jo				
	u	un	uŋ	uj	
-	帆兀 u	溫穩 un	翁 uŋ	為委 uj	
pu	不步卜 pu	奔 pun		北 puj	
mu	木 mu	門 mun	蒙 muŋ	梅 muj	
tu	都覩 tu	敦 tun	董 tuŋ	對 tuj	
tb <u>u</u>	禿土圖 tb <u>u</u>	屯 tb <u>un</u>	統 tb <u>uŋ</u>		
s	速 su	孫 sun		遂 suj	
n	訥 nu	嫩 nun	農 nuŋ		
l	魯 lu	論 lun	籠 luŋ	雷 luj	
č			中 tʃuŋ		
čʰ			充 tʃʰuŋ	垂 tʃʰuj	
š				水 ſuŋ	
k	古 ku	昆棍 kun	公 kuŋ	癸 kuj	
kʰ	窟 kʰu	坤 kʰun	孔 kʰuŋ	恢 kʰuj	
x	忽呼 xu	渾 xun	洪 xuŋ	灰 xuj	
	i	im	in	iŋ	iw
-	亦 ji	音 jim	因 jin	媵 jinŋ	
p	必 pi		賓 pin		
m	米 mi		民敏 min		
t	的 ti		丁 tiŋ		
s	昔 si				
n	你泥 ni		紉您 nin		紐 niw
l	里驪黎 li	林 lim	鄰麟 lin	靈 liŋ	留 liw
č	直 tʃi	只 tʃr	真 tʃin	征 tʃiŋ	州 tʃiw
čʰ	赤 tʃʰi	沉 tʃʰim	陳臣 tʃʰin	成 tʃʰiŋ	抽 tʃʰiw
š	石 sɪ	失 sr	申 sin	升 siŋ	守 siw
k	吉 ki		斤 kin	京 kiŋ	
kʰ	乞 kʰi	欽 kʰim	勤 kʰin	輕 kʰiŋ	
x	希喜 xi		欣 xin	興 xiŋ	

TABLE 8.1 (*cont.*)

ø	øn	y	yn	yŋ
- 月	ψε	余 y	云 yn	
s 雪	sψε	旋 sɥen	循 syn	松 sjŋŋ
l 苦	lψe	驟 ly	侖 lyn	
č 拙	tʂwε	主 tsy	諱 tʂyn	
čʰ 嘁	tʂʰwε	出 tʂʰy		
š		暑 sy		
kʰ 缺	kʰψε	曲 kʰy		
x		許 xy		

According to Pulleyblank, Northern Chinese of the Yuan period had lost the voiced stops and affricates which occurred in Middle Chinese, and like Modern Standard Chinese it distinguished only two series, voiceless unaspirated (*p, t, k, tʂ*) and voiceless aspirated (*pʰ, tʰ, kʰ, tʂʰ*) (cf. also Hattori 1946: 79–113; 1973 and Finch 1986).

Mongolian syllable onsets contain some consonants that do not occur in Chinese. They are denoted by the addition of small superscript characters. The Chinese character 中 *zhōng* ‘middle’ is added to characters with initial *x*, probably to indicate uvular pronunciation χ, e.g. 忽 χu (from 忽 xu).

Pulleyblank’s reconstruction of Yuan Chinese does distinguish between *l* and *r*, but characters with initial *r* are not used in Sino-Mongolian. Presumably the Yuan Chinese *r*, which developed from an earlier \*j, was similar to its Modern Standard Chinese reflex, a retroflex fricative [z̠], and was felt to be different from Mongolian vibrant [r]. Instead, [r] was indicated with the character 舌 shé ‘tongue’ supercribed to a syllable beginning with [l], for example 舌樂 ron (from 樂 lon).

The consonants given in (4) occur in syllable codas.

(4)	p	t <sup>h</sup>	k <sup>h</sup>
	s	x	
m	n	ŋ	
l			
r			
w		j	

In Yuan Chinese, only the nasals *m, n, ŋ*, and the glides *w, j* could form codas. The other Sino-Mongolian coda consonants are indicated by the addition of an extra character whose onset denotes the syllable coda. The codas *p, tʰ, kʰ, x, l* are written with subscript characters (𢑤 YCh pu, 惕 tʰi, 克 kʰɔj, 黑 xɔj, 勒 lɔj) and *s* with a full-size思 sz. The coda *r* is written as 兒 rr or 舌兒. The coda *m* is sometimes indicated with a Chinese character with the coda *m*, but sometimes by the addition of the subscript character 木 mu. The coda *m* was probably disappearing (merging with *n*) in the form of Chinese which is the base for the Sino-Mongolian transcriptions. The

*Hua-Yi yiyu* sometimes uses a superscript character  $\bar{d}$  to indicate final *l*, as in  $\bar{d}$ 溫 SM *ul* (from 溫 YCh *un*).

### 8.2.2 Sino-Mongolian vowels

The relation between the Yuan Chinese and Sino-Mongolian vowels is less straightforward than for the consonants. The discrepancy between the Mongolian and Chinese vowel systems is rather large, and we have followed the tradition of transcribing Sino-Mongolian by converting the Chinese vowels to the seven Old Mongolian vowels *i*, *y*, *e*,  $\phi$ , *u*, *o*, *a* (5).

#### (5) Sino-Mongolian vowels

vowel		example		vowel		example	
YCh	SM	YCh	SM	YCh	SM	YCh	SM
a	a	苔	ta	ta	e	良	ljan
ɔ	a	哈	xɔ	xa	e	者	tšia
	o	朵	tɔ	to	e	克	kʰej
wɔ	o	豁	xwɔ	xo	i	你	ni
wa	o	槐	xwaj	xoj	i	亦	ji
ɥɛ	ø	雪	sɥɛ	sø	i	只	tʂ̥i
wɛ	ø	啜	tʂʰwɛ	čʰø	u	忽	xu
ɛ	e	扯	tʂʰɛ	čʰe	y	許	xy
je	e	別	pje	pe	ju	松	sjuŋ
jaj	e	額	jaj	e			syŋ

Combinations of a glide+vowel in Yuan Chinese are interpreted as single Sino-Mongolian vowels, but combinations vowel+glide are interpreted as Sino-Mongolian vowel+glide. For example, YCh *wɛ*, combining the features round (from *w*), front, and open is interpreted as SM *ø*, but YCh *ɛw* is interpreted as SM *ew* (cf. Kuz'menkov 1987).

The YCh vowel *ɔ* contrasts with *a* after most onsets, and contrasts with *wɔ* (but not with *a*) after velar onsets and the zero onset. In the first case, YCh *ɔ* is interpreted as SM *o* and YCh *a* as SM *a*; in the second case, YCh *ɔ* is interpreted as SM *a*, and YCh *wɔ* as SM *o* (see (5) and Table 8.1 for examples).

The choice of Sino-Mongolian *y*,  $\phi$  vs. *u*, *o* is dictated more by Chinese phonotactics than by the actual Mongolian vowel. The front rounded vowels are less common than the back ones in Chinese, so the Old Mongolian vowels \**y* and \* $\phi$  are often represented by Sino-Mongolian *u* and *o*; conversely, Old Mongolian \**u* and \**o* are represented by Sino-Mongolian *y* and  $\phi$  in a few cases.

Undoubtedly it is a bit circular to use a transcription which treats the vowels in this way as a basis for reconstructing Old Mongolian, but all cited Sino-Mongolian forms are given with their Chinese characters in the Old Mongolian vocabulary in section 8.9, so that the reconstructed Yuan Chinese reading can be retrieved from Table 8.1.

Some researchers maintain that a vowel length distinction is indicated in some words in the *Secret history*. For example, the characters 朵 and 多 have the same segmental pronunciation *tɔ* in Pulleyblank's Yuan Chinese reconstruction, but 朵 has rising tone and 多 upper level tone, which might implicate a difference in duration, as in Modern Standard Chinese. According to Murayama (1970), the character 朵 is normally used in those words which have a long vowel reflex in some modern languages, possibly inherited from Proto-Mongolic, and the character 多 is seldom used in such words. For example, 'four' is written 朵兒邊 *torpen* in the *Secret history*. Our Old Mongolian reconstruction is \**tørpen*, but the long vowel in Mongolian *teeren* indicates that Proto-Mongolic might have had a long vowel (see 8.5.1, and also Manlažav 1969; Kuz'menkov 1989; 1993a). The development of such words in modern languages is not uniform, however, and it is difficult to judge if, and to what extent, the *Secret history* indicates vowel length.

### 8.3 ARABIC MONGOLIAN<sup>2</sup>

There are several texts from the fourteenth and fifteenth centuries where Mongolian words are written with the Arabic alphabet. The most important one is a fourteenth century manuscript of the dictionary *Muqaddimat al-adab* 'Preamble to literature' by Abū'l-Qāsim Maḥmūd ibn-'Umar al-Zamaxšāri with Mongolian glosses written with the Arabic alphabet. Poppe (1938–9) has published the Mongolian and Turkish words in this manuscript and provided them with Russian translations. Other Arabic Mongolian texts are the Mongolian glossary in *Hilyat al-insān wa halbat al-lisān* 'The ornament of man and the arena of language' by Jamāl al-Dīn ibn-Muhammā (beginning of fourteenth century; see Poppe 1938–9: 43–51), and the anonymous *Kitāb majmū' tarjumān Turkī wa 'Ajāmi wa Mughulī wa Fārsī* 'Collection for the Turkish–Persian–Mongolian–Persian interpreter' (the 'Leiden manuscript') of 1343 (Poppe 1927–8). We transliterate the Arabic alphabet as shown in (6).

(6) Arabic letters used in the Mongolian transcriptions

ب	b	س	s	ك	k	ه	h
ت	t	ش	š	ل	l		
ج	ج	غ	g	م	m	(ص)	ṣ
د	d	ق	q	ن	n	(ط)	ṭ
ر	r						
أ	a	إ	'a	ء	ə		
و	u (w)	أو	'u				
ى	i (j)	اي	'i				

Arabic has only three vowel qualities, [a], [i], [u]. In the Mongolian transcriptions of *Muqaddimat al-adab*, the vowels are usually written with letters indicating Arabic long vowels, ا, او, اي. We transliterate them simply as <a, i, u>, since they

<sup>2</sup> For notes on Arabic Mongolian, see App. H, 8.3, p. 223.

do not indicate vowel length, but only the quality of the vowel. At the beginning of words, <i> and <u> are usually written with an initial ئِ, transliterated <'>, 'ida 'to eat', اُو 'u 'to drink'), and the letter ئِ, transliterated <'a>, is sometimes used instead of ئِ (اموسې، 'amusba 'to wear-PST'). Word-final ئِ probably denotes the same vowel phoneme as ئِ; we transliterate it as <a>: قۇلە qula 'far'. Saitô (2000; 2003) interprets the variation between these two word-final vowels as an indication of an ongoing process of vowel reduction.

Short Arabic vowels indicated with sub- or superscript letters are written in a few cases in *Muqaddimat al-adab*, and more often in the Leiden manuscript. They are transliterated <ă, ī, ū>, for example, كىلەن kilän 'tongue'. If no vowel is written in the Arabic script, no vowel is shown in the transliteration: غربان ərban 'three' (OM \*kurpan). When three vowel letters follow each other, the middle one is interpreted as a glide w or j: جاۋۇن jawun 'hundred', هوپا huja 'to tie'. Similarly, initial ئِ followed by a vowel is transcribed j: يابۇ jabu 'to go'.

Thus the Arabic Mongolian grapheme system is:

(7)	i	u	t	k	q	'
			b d ġ			
	a/ă		s	š		h
					χ	
	m	n				
		l				
	r					
	w		j			

As seen in (7), voiced and voiceless stops are not differentiated, except *d* and *t* (corresponding to Old Mongolian \**t* and \**t<sup>h</sup>*). In the uvular region, there are two consonants, the voiceless stop *q* and the voiced fricative *χ*. They correspond to Old Mongolian uvular stops, aspirated \*[*q<sup>h</sup>*] and unaspirated \*[*q*], which in our reconstruction are regarded as allophones of the phonemes \*/*k<sup>h</sup>*/ and \*/*k*/ in back-vocalic words. This is the only source for Old Mongolian which differentiates \*[*q<sup>h</sup>*] and \*[*q*].

The 'emphatic' (pharyngealized) consonant *s* is used for OM \**s* in a few words with back vowels, for example, اوصون 'uṣun 'water', where this sound apparently was felt to be closer to the Mongolian pronunciation than plain [s]. This suggests that vowel pharyngealization (10.1) had started already in the language of the Arabic Mongolian texts. Similarly, emphatic *t* ط is used in a few words with back vowels, e.g. طاقىة taqia 'hen' (also written with plain *t*: taqia).

#### 8.4 'PHAGS-PA MONGOLIAN

Chinggis's grandson Qubilai, who founded the Mongolian–Chinese Yuan dynasty, introduced a new official script in 1269, to be used in all parts of his empire for Mongolian, Tibetan, and Chinese. This script, which was based on the Tibet-

an alphabet, was designed by the 'Phags-pa Lama, and is known as the 'Phags-pa script or the square script (*dörvölzjin bičig*). It was used as an official script until the fall of the Yuan dynasty in 1368. Only about sixty 'Phags-pa texts are preserved, most of them imperial edicts or other official documents. The most convenient edition is Poppe (1957), which is the English version of an earlier work in Russian (Poppe 1941b). It contains high-quality photographs of the texts, transcriptions, English translations and comments, and a glossary, as well as a general introduction to the 'Phags-pa script. There are several later collections which contain more texts, however (see 8.9 for the sources we have used).

The 'Phags-pa script is written in columns which follow each other from left to right. The alphabet is given in (8).

(8) *'Phags-pa letters used for Mongolian*

<i>Consonants</i>				<i>Vowels</i>			
ᠮ	k	ᠮ	d	ᠮ	j	ᠮ	o
ᠥ	kʰ	ᠥ	n	ᠥ	r	ᠥ	u
ᠮ	g	ᠮ	p	ᠮ	l	ᠮ	i
ᠵ	ŋ	ᠵ	b	ᠵ	š	ᠵ	ɪ
ᠴ	č	ᠴ	m	ᠴ	s	ᠴ	e
ᠵ	čʰ	ᠵ	w	ᠵ	h	ᠵ	ø
ᠵ	ž	ᠵ	z	ᠵ	∅	ᠵ	y
ᠲ	t	ᠲ	,	ᠲ	q		
ᠲ	tʰ						

The grapheme system shown in (9) can be inferred.

(9)	i	y	u	b	d	ž	g	
	ɪ					(k)	q	,
	e	ø	o		tʰ	čʰ	kʰ	
					s/z	š		h
				m	n	ŋ		
					l			
					r			
				w		j		

The 'Phags-pa script distinguishes three series of stops and affricates: voiced, voiceless unaspirated, and voiceless aspirated. In the Mongolian transcriptions, the voiced (*b*, *d*, *g*, *ž*) and voiceless aspirated (*tʰ*, *kʰ*, *čʰ*) series are normally used, corresponding to Old Mongolian voiceless unaspirated (\**p*, \**t*, \**k*, \**č*) and aspirated (\**tʰ*, \**kʰ*, \**čʰ*) consonants. There is only one letter in the uvular region, probably representing the voiceless stop *q*. Voiceless unaspirated *k* is written in a few words, for example, **ᠵ** **ᠮ** **ᠵ** *jike* 'big', but the consonant letters *p*, *t*, *č* are not used in indigenous Mongolian words. The letter *z* is found only in the word **ᠮ** **ᠥ** *zara* 'moon', where it probably represents [s].

There are seven vowel letters. The letters for *ø* and *y* are compounds, *eo* and *eu*, respectively. Jagunasutu (1987c) regards the vowel letters as given in (8) as

the basic ones. In word-initial position, the letters *o*, *u*, *i*, *r* have a bar above them (𠂇 𢃇 𢃈 𢃉), and initial *ø* and *y* are preceded by the zero initial letter 𢃁, having the forms 𢃁𠂇 and 𢃁𢃉. When there is a following consonant in the same syllable, the form 𢃁 of *o* is normally (but not always) used. Following Ligeti (1961), we transcribe it as *ô* (and the corresponding *ø* form 𢃁*e* (*eô*) as *ô*). There is some graphic variation, for example, the letter 𢃉 *i* is sometimes written 𢃉.

The letter 𢃉 is usually transliterated <é>. Poppe (1957: 25) says that this vowel is more closed than 𢃁<e>. Kögjiltü (1983; 1987c) and Jagunasutu (1988) make the more precise assumption that it was pronounced [i], and we transcribe it with this character. It stands in almost complementary distribution with *e*, usually occurring at the beginning of words, in contact with palatal and alveopalatal consonants, or as the second element of a diphthong. Hattori (1984; 1989) argues that 𢃉<i> and 𢃁<e> represent the same sound.

'Phags-pa Mongolian does not usually write the letter 𢃁<y> in non-initial syllables, but we assume that 𢃁<u> denotes the sound [y] in non-initial position in front-vocalic words (cf. 8.6). We still transcribe it as <u>, however. A number of 'Phags-pa Mongolian words are written with <u> in some texts and with <y> in others. For example, 'to reach' can be written 𢃁𢃉𢃁 *k<sup>h</sup>ur* or 𢃁𢃉𢃁 *k<sup>h</sup>yr*. Such words usually contain velar consonants, and for this reason we assume that the vowel was pronounced *y* (see 8.6.2), but we write it as *u* or *y* in the transliterations, depending on the original spelling.

As in the Tibetan alphabet, there is no letter for the vowel *a*, but an onset consonant without a vowel letter is interpreted as being followed by this vowel. There is usually a small space between the syllables. This is essential for deciding whether or not an *a* should be read. For example, 𢃁 𢃉 𢃁 is different from 𢃁 𢃉𢃁. These words can be transliterated letter for letter as <*t<sup>h</sup>.bu.n*> and <*t<sup>h</sup>.bun*>, where <.> denotes the space between syllables. In the first word, *t<sup>h</sup>abuna* 'five-DAT', the space before *n* shows that it is the onset of a syllable *na*, and the absence of a space in the the second word, *t<sup>h</sup>abun* 'five', shows that *n* is a syllable coda.

We transliterate the letter 𢃁 as <'>. It may have been a glottal stop, or just a hiatus marker; Poppe (1957) and Jagunasutu (1989), both of whom transliterate it as <·>, regard it as a kind of zero initial. It is written in word-initial position in some words, and also between two vowels inside words, e.g. 𢃁 𢃉 𢃁 <Ø.'u.l> *a'ula* 'mountain'. As this example also shows, the syllable *a* is written with the zero initial 𢃁.

An onset consonant can combine with 𢃁 for example, in 𢃁 𢃁𢃁 <*č<sup>h</sup>.q'n*> 'white' and 𢃁𢃁 𢃁 <*d'e.re*> 'above'. In those cases where the 𢃁 is not separated from the preceding consonant with a space, we assume that there is one syllable with a long vowel rather than two syllables, so we transcribe the exemplified words as *č<sup>h</sup>aqaan* and *deere* (cf. Kögjiltü 1999). There are other words where the 𢃁 is preceded by a vowel and a space, for example, 𢃁 𢃁𢃁 <*t<sup>h</sup>o.on*> 'number' and 𢃁𢃁 𢃁 𢃁 <*y.ju.ur*> 'point'. We transcribe them with <'> (*t<sup>h</sup>o'on*, *yju'ur*), although these words probably had long vowels, like the others.

The *i*-diphthongs are written with <*ji*> in back-vocalic and with <*i*> in front-vocalic words, for example, 𢃁𢃁 𢃁 <*nji.m.n*> 'eight-DAT'; 𢃁 𢃁𢃁 <*mo*>

qöji > ‘snake’; **风** <k<sup>h</sup>ei> ‘wind’. Since they are written together with the preceding vowel and consonant as one unit without syllable space, and with the combination form of *o*, we assume that they belong to the same syllable as these. For this reason we transcribe these words as *naimana*, *moqöi*, *k<sup>h</sup>ei*. In some words there is a clear syllable boundary space, as in **好** <s.jin> ‘good’, in which case we write *ji* in the transcription (*sajin*), although it can be doubted if this really denotes a different sound.

### 8.5 OLD MONGOLIAN VOWELS<sup>3</sup>

The reconstruction of the Old Mongolian vowel system is fairly uncontroversial, except for two points discussed below: the possible existence of a back high unrounded vowel, and the occurrence of ‘primary’ long vowels.

The sources indicate a seven-vowel system in word-initial syllables (10). Non-initial vowels are discussed in section 8.6.

- (10) *Old Mongolian vowels in the initial syllable*
- |   |   |   |
|---|---|---|
| i | y | u |
| e | ø | o |
| a |   |   |

These vowels are reconstructed from the correspondences shown in (11). Examples are given in Table 8.2.

- (11) *Old Mongolian vowels in the initial syllable*
- |    | OM | *a | *o | *u   | *e | *ø | *y | *i |
|----|----|----|----|------|----|----|----|----|
| UM | a  | u  | u  | a, e | y  | y  | i  |    |
| SM | a  | o  | u  | e    | o  | u  | i  |    |
| AM | a  | u  | u  | i    | u  | u  | i  |    |
| Ph | a  | o  | u  | e, i | ø  | y  | i  |    |

Only the ’Phags-pa script distinguishes all vowels. It even writes an eighth vowel, *i*, which we regard as an allophone of *e* (or of *i* in diphthongs). Uigur Mongolian does not differentiate \**u* and \**o* (or \**y* and \**ø*). Sino-Mongolian distinguishes \**u/y* from \**ø/ø*, but not, except in a few cases, \**u* from \**y* or \**o* from \**ø*. Since Arabic has only three vowels (*i, u, a*), *u* must represent all four rounded vowels in Old Mongolian, and Arabic *i* corresponds to Old Mongolian \**i* or \**e* in the initial syllable.

All vowels except \**i* itself form diphthongs with a following \**i*. These diphthongs are represented in the sources as *Vi*, *Vij*, *Vj*, or *Vl* (Vladimircov 1929: 255, 266ff.; Poppe 1955: 76ff.; Jirannige 1985). There is also a diphthong \**au*. Diphthongs occur both in initial and in non-initial syllables. Examples are given in (12). Uigur Mongolian *uji* and *yi* are graphically identical, **尤** (or **尤**), so the difference made between them in (12) is artificial.

<sup>3</sup> For notes on Old Mongolian vowels, see App. H, 8.5, p. 224.

TABLE 8.2 *Examples of initial and non-initial vowels*

	OM	UM	SM	AM	Ph	
*a-a	*al <sup>h</sup> an	aldan	al <sup>h</sup> an	altan	al <sup>h</sup> an	'gold'
*a-u	*japu	jabu	japu	jabu	jabu	'to go'
*a-i	*amin	amin	amin	amin	amin	'life'
*u-a	*tumta	tumda	tunta	dund <sup>h</sup> a	dumda	'middle'
*u-u	*usun	usun	usun	'ušun	usun	'water'
*u-i	*urita	urida	urita	'urida	urida	'before'
*o-a	*k <sup>h</sup> ojar	qujar	χojar	qujar	qojar	'two'
*o-u	*t <sup>h</sup> osun	tusun	t <sup>h</sup> osun	tusun	t <sup>h</sup> osun	'fat'
*o-i	*čok <sup>h</sup> i	juqi	čewk <sup>h</sup> i	juqi	joqi	'to fit'
*e-e	*nere	nar-a	nere	nir <sup>h</sup> a	nere	'name'
*e-y	*ehyten	ekudan	euten	'iudan	i'uden	'door'
*e-i	*setk <sup>h</sup> il	sadkil	set <sup>h</sup> k <sup>h</sup> il	sitkil	sedk <sup>h</sup> il	'mind'
*y-e	*yke	yka	uke	'uk <sup>h</sup> a	'yge	'word'
*y-y	*yk <sup>h</sup> y	yku	uk <sup>h</sup> u	'uku	yk <sup>h</sup> u	'to die'
*y-i	*pyrin	byrin	puri	buri	byrin	'each'
*ø-e	*tørpen	tyrban	torpen	durban	dørb <sup>h</sup> e	'four'
*ø-y	*mølsyn	mylsun	molsun	mulsun		'ice'
*ø-i	*øk <sup>h</sup> in	ykin	ok <sup>h</sup> in	'ukin		'girl'
*i-a	*k <sup>h</sup> ičahar	qičaqar	k <sup>h</sup> ičaar	qičar	k <sup>h</sup> ičaar	'border'
*i-u	*nihu	niču	niu	niu		'to hide'
*i-o	*siŋk <sup>h</sup> or	sinkqur	šiŋχor	šūqür	šiŋqōr	'falcon'
*i-e	*irken	irkan	irken	'irkān	'irgen	'people'
*i-y	*nityn	nidun	nitun	nidun		'eye'
	*hiryher	irukar	xiruer	hirar	hiru'er	'blessing'
*i-i	*pič <sup>h</sup> ik	bičik	pič <sup>h</sup> ik <sup>h</sup>	bičik	bič <sup>h</sup> ig	'letter'
*i-ø	*č <sup>h</sup> itk <sup>h</sup> ør		č <sup>h</sup> itk <sup>h</sup> or	č <sup>h</sup> tkr		'devil'

(12) *Examples of Old Mongolian diphthongs*

	OM	UM	SM	AM	Ph	
*ai	*naiman	naiman	najman	naiman	naiman	'eight'
	*sain	sajin	sain	sain	sajin	'good'
	*kak <sup>h</sup> ai	qaqai	χaxaj	qaqai	qaqai	'pig'
*oi	*oira	ujir-a	oira	'uir <sup>h</sup> a		'near'
	*k <sup>h</sup> oina	qujiňa	χoina	quin <sup>h</sup> a	qojina	'back'
*ui	*uila	ujila	ujila	'uil <sup>h</sup> a		'to cry'
*ei	*k <sup>h</sup> ei	kai	k <sup>h</sup> ej	kiji	k <sup>h</sup> ei	'wind'
	*nek <sup>h</sup> ei		nek <sup>h</sup> ej	nikai		'sheepskin'
*øi	*k <sup>h</sup> øisyn	kyisun	k <sup>h</sup> oisun	kuisun		'navel'
	*k <sup>h</sup> øit <sup>h</sup> en	kyidan	k <sup>h</sup> oit <sup>h</sup> en	kuitan		'cold'
*yi	*yile	yila	ujile	'uil <sup>h</sup> ä	yile	'deed'
*au	*t <sup>h</sup> aulai	taulai	t <sup>h</sup> awlaj	taulai	t <sup>h</sup> awlai	'hare'
	*k <sup>h</sup> auli	qauli	χauli		qa'uli	'law'

### 8.5.1 Primary long vowels<sup>4</sup>

None of the sources for Old Mongolian shows vowel length, except perhaps Sino-Mongolian; the 'Phags-pa long vowels are secondary, corresponding to two vowels in Uigur Mongolian and Sino-Mongolian. Consequently we do not reconstruct vowel length for Old Mongolian. There are some indications, however, that Proto-Mongolic might have had phonemic vowel length, or at least traces of it. Dagur, Shira Yugur, Monguor, and Bonan have long vowels in some words (indicated with italics in (13)), where Old Mongolian and the other Mongolic languages (here exemplified with Halh) all have short vowels.

(13)	OM	Dagur	Shira Yugur	Monguor	Bonan	Halh
'five'	* <i>thapun</i>	<i>tʰaaawə</i>	<i>tʰaaawyn</i>	<i>tʰaaawun</i>	<i>tʰawoŋ</i>	<i>tʰaw</i>
'tree'	* <i>motun</i>	<i>mɔɔt</i>	<i>muuutyn</i>	<i>mooti</i>	<i>motʰoŋ</i>	<i>mɔt</i>
'bride'	* <i>peri</i>	<i>pvr̩j</i>	<i>peery</i>	<i>peeri</i>	<i>weruu</i>	<i>pir</i>
'fat'	* <i>thosun</i>	<i>tʰɔs</i>	<i>tʰuuusyn</i>	<i>tʰooši</i>	<i>tʰosoŋ</i>	<i>tʰɔs</i>
'to guard'	* <i>sakʰi</i>	<i>sakj</i>	<i>saaky</i>	<i>ski</i>	<i>saaqa</i>	<i>saxj</i>
'horse'	* <i>morin</i>	<i>mɔrj</i>	<i>moɔry</i>	<i>mori</i>	<i>moruu</i>	<i>mɔrj</i>
'four'	* <i>tørpen</i>	<i>turp<sup>w</sup></i>	<i>tørwen</i>	<i>teeren</i>	<i>teraq</i>	<i>torəw</i>
'fine'	* <i>narin</i>	<i>narjən</i>	<i>naryn</i>	<i>narin</i>	<i>naaraŋ</i>	<i>narjŋ</i>
'year'	* <i>hon</i>	<i>xɔɔn</i>	<i>hɔn</i>	<i>xon</i>	<i>hoŋ</i>	<i>ɔŋ</i>

The existence of such correspondences has been explained by assuming that Proto-Mongolic had 'primary' long vowels in these words, although the evidence for this is rather scanty, and the developments in the different modern languages are not uniform. In our opinion, the existence of vowel length in Proto-Mongolic can be doubted.

The theory that long vowels existed in Proto-Mongolic has been used for explaining why the intervocalic consonant, here reconstructed as \**h*, disappeared in all old and modern languages except Uigur Mongolian (see 8.7.2 and 10.3).

## 8.6 VOWELS IN NON-INITIAL SYLLABLES AND VOWEL HARMONY<sup>5</sup>

It is generally assumed that Old Mongolian (and Proto-Mongolic) had palatal (back ~ front) vowel harmony, and we will also make this assumption. There is, however, only incomplete support for this in the sources. None of the sources distinguishes non-initial back and front rounded vowels, and only Sino-Mongolian and 'Phags-pa Mongolian distinguish non-initial *a* and *e*. Keeping strictly to the sources, only the vowels in (14) can be reconstructed in non-initial syllables.

<sup>4</sup> For notes and sources on primary long vowels, see App. H, 8.5.1, p. 224.

<sup>5</sup> For notes and sources, see App. H, 8.6, p. 224.

(14) *Old Mongolian vowels in non-initial syllables*

OM	*a	*e	*u/y	*o/ø	*i
UM	a	a	u	u	i
SM	a	e	u	o	i
AM	a, ą	a, ą	u	u	i
Ph	a	e	u	o	i

Non-initial \*a and \*e follow vowel harmony so that \*a is found only when the initial vowel is back (or \*i), and \*e only when the initial vowel is front. Although palatal vowel harmony thus is visible in the sources only for \*a ~ \*e, it is unlikely that it applied only to one of the three vowel pairs which contrasted in the back ~ front dimension in initial syllables. For this reason we assume that not only \*a ~ \*e, but also \*u ~ \*y (and, in a few words, \*o ~ \*ø), must have alternated in non-initial syllables. Thus we reconstruct \*y and \*ø rather than \*u, \*o in non-initial syllables, when the initial syllable has a front vowel.

Under these assumptions, only the combinations of initial and non-initial vowels shown in (15) occur. Examples are given in Table 8.2.

(15) *Vowel sequencing in Old Mongolian*

See section 8.6.1 for the sequences o–o and ø–ø.

initial vowel	non-initial vowel						
	*a	*u	*o	*e	*y	*ø	*i
*a	+	+					+
*u	+	+					+
*o	+	+	(+)				+
*e				+	+		+
*y				+	+		+
*ø				+	+	(+)	+
*i	+	+	+	+	+	+	+

Palatal harmony applies to suffixes as well as to stems. This can be exemplified with the dative suffix -a/e in Sino-Mongolian (*χurpan-a* ‘three-DAT’ vs. *irken-e* ‘people-DAT’) and ‘Phags-pa Mongolian (*tʰabun-a* ‘five-DAT’ vs. *dørben-e* ‘four-DAT’). Old Mongolian and Hahn vowel harmony are compared in section 10.6.2.

8.6.1 *Rounding assimilation*

The open rounded vowels o and ø are rare in non-initial syllables in the sources. They occur in a few words where the first vowel is \*i, and also in some words where the initial syllable has the same vowel (o or ø) as the second one. In the first case we reconstruct non-initial \*o or \*ø for Old Mongolian, but not in the second case. The reason for this is that when the vowel of the first syllable is reconstructed as \*o or \*ø, and the following vowel is open, there is often disagreement between the

sources whether the second vowel is rounded or not, as illustrated in (16). A general tendency is that Arabic Mongolian shows a rounded second vowel less often than the other sources. This may be a dialect feature connecting Arabic Mongolian with modern Oirad.

(16) *Rounding assimilation in the Old Mongolian sources*

OM	UM	SM	AM	Ph	
*k <sup>h</sup> ojar	qujar	χojar	qujar	qajar	‘two’
*ora	ura	oro	'ura	oro	‘to enter’
*nok <sup>h</sup> ai	nuqai	noχaj	nuqai	noqōi	‘dog’
*moŋkal	munkqul	maiχol	mnzul	mōŋqōl	‘Mongol’
*tørpen	tyrban	torpen	durban	dōrbe	‘four’
*nøk <sup>h</sup> er	nykur	nok <sup>h</sup> ar	nukr	nøk <sup>h</sup> ør	‘friend’

Progressive rounding assimilation of the second vowel (known as ‘labial attraction’) is thus a process that started already in Old Mongolian. Since it is difficult to sort out which words had rounded non-initial open vowels at the Old Mongolian stage, we will assume, and build into the reconstruction, that there was no rounding assimilation in Old Mongolian, so that the open rounded vowels \*o and \*ø occurred in non-initial syllables only if the vowel of the initial syllable was \*i (cf. Vladimircov 1929: 315f.; Poppe 1951b; de Rachewitz 1999).

Even if there is some rounding assimilation in the Old Mongolian sources, it does not affect suffixes. This can be exemplified with the roots \*pos ‘to rise’ and \*k<sup>h</sup>øl ‘foot’ which take unrounded open suffix vowels in all sources (e.g. UM *bus–qa* [CAUS], AM *bus–ba* [PST], Ph *bōs–qa* [CAUS]; UM *kyl–ijan* [RFL], SM *k<sup>h</sup>ol–ijan* [RFL], AM *kul–an* [RFL]). Thus Old Mongolian did not have rounding harmony, unlike modern Mongolian proper, but like most other modern Mongolic languages.

### 8.6.2 *Alternation of velar and uvular consonants*

As mentioned above, the velar stops \*[k<sup>h</sup>] and \*[k] occur only in front-vocalic words, and the uvular stops \*[q<sup>h</sup>] and \*[q] only in back-vocalic words (which may contain the front vowel \*i). Suffixes with velar or uvular stops alternate so that the velar variant occurs in front-vocalic and the uvular one in back-vocalic words. For example, the future participle suffix alternates between \*[-k<sup>h</sup>y] in front-vocalic and \*[-q<sup>h</sup>u] in back-vocalic words (17). The vowel alternation is not visible, but all sources show the alternation between velar and uvular consonants.

(17) *Velar ~ uvular alternation in vowel harmony*

OM	UM	SM	AM	Ph	
*[mete–k <sup>h</sup> y]	mada–ku	mete–k <sup>h</sup> un	mida–ku	mede–k <sup>h</sup> un	‘to know’
*[japu–q <sup>h</sup> u]	jabu–qu	japu–χu	jabu–qu	jabu–qu	‘to go’

### 8.6.3 Neutral \*i

The phonetically front vowel *\*i*, which has no back counterpart, can combine with any vowel in any position in the same word; see (15) and examples in Table 8.2. Old Mongolian *\*i* is thus transparent in the sense that it is ignored by vowel harmony. An intervening *\*i* is followed by vowels which harmonize with the vowel preceding the *\*i*. This can be seen within root words as *\*t<sup>h</sup>ak<sup>h</sup>ijsa* ‘hen’ vs. *\*eč<sup>h</sup>ike* ‘father’ or *\*urita* ‘before’ vs. *\*yñijen* ‘cow’. The Sino-Mongolian forms *t<sup>h</sup>ak<sup>h</sup>ijsa*, *eč<sup>h</sup>ike*, *urita*, *yñien* distinguish *a* and *e* explicitly. This can also be exemplified with the *a* ~ *e* alternation of suffixes added to words with *i* in non-initial position, seen explicitly in Sino-Mongolian forms as *morin-ač<sup>h</sup>a* ‘horse-ABL’ vs. *č<sup>h</sup>erik-ijer* ‘soldier-INST’, and ‘Phags-pa Mongolian *morin-ijsan* ‘horse-RFL’ vs. *byrin-e* ‘each-DAT’.

Initial *\*i* can be followed by either back or front vowels. Again, this is visible in the sources only for Sino-Mongolian and ‘Phags-pa Mongolian *\*a* ~ *\*e*. Inflected forms of such words show that the first vowel which is not an *\*i* determines the vowel harmony class of the word. Examples with the dative suffix *\*-e/a* are Sino-Mongolian *irken-e* ‘people-DAT’ vs. *k<sup>h</sup>ilpar-a* ‘easy-DAT’ and ‘Phags-pa Mongolian *irgen-e* ‘people-DAT’ vs. *jirqo'an-a* ‘six-DAT’.

When the first vowel of a word is *i* and the following one is *u* or *o* in the sources, it cannot be decided directly if the word is back- or front-vocalic. If the word contains a velar or uvular consonant, this shows the vowel harmony class. For example, since all sources show an uvular consonant in the word ‘falcon’ (UM *sinkqur*, SM *šijqor*, AM *šuqür*, Ph *šinqôr*), it must be back-vocalic (OM *\*sijq<sup>h</sup>or*), but ‘devil’ (SM *č<sup>h</sup>it<sup>h</sup>k<sup>h</sup>or*, AM *č<sup>h</sup>tk<sup>h</sup>r*), with velars, must be front-vocalic (OM *\*č<sup>h</sup>itk<sup>h</sup>ør*).

If a word of this type does not contain a velar or uvular, its vowel harmony class can be determined if a suffix contains *e/a* or a velar/uvular. For example, the Sino-Mongolian forms *nitu-pen* ‘eye-RFL’ and *č<sup>h</sup>isu-pan* ‘blood-RFL’ show that ‘eye’ is front-vocalic (*\*nity/n*) and ‘blood’ is back-vocalic (*\*č<sup>h</sup>isu/n*).

Words which contain no other vowels than *\*i* can be either front or back. There are rather few examples in the sources of such words with suffixes that reveal the vowel harmony class, but most of these words take front-vocalic/velar suffixes, for example, *\*khi* ‘to do’ (UM *ki-kun* [FUTP], SM *k<sup>h</sup>i-k<sup>h</sup>un* [FUTP], AM *ki-ku* [FUTP], Ph *k<sup>h</sup>i-k<sup>h</sup>un* [FUTP]) and *\*pičhi* ‘to write’ (UM *biči-kui* [FUTP], AM *bj<sup>h</sup>-ksan* [PSTP], Ph *bič<sup>h</sup>i-bei* [PST]). Exceptions are the words *\*nis* ‘to fly’ and *\*nisi* ‘to beat’, which take suffixes with an uvular consonant or the back vowel *a* (AM *nis-qa-ba* [CAUS-PST]; SM *niši-t<sup>h</sup>uχaj* [IMP], SM *niši-xta-χun* [PASSIVE-FUTP]). There is conflicting evidence for the word *\*č<sup>h</sup>ik<sup>h</sup>in* ‘ear’, which takes front-vowel suffixes in Sino-Mongolian (*č<sup>h</sup>ik<sup>h</sup>i-pen* [RFL]), while its Arabic Mongolian form *jiqin* contains the uvular consonant *q*. Unlike the case in Old Mongolian, Halkh words with *i* as the only vowel always take non-pharyngeal suffixes, e.g. *pič<sup>h</sup>-č<sup>h</sup>e* бичлээ ‘to write-DPST’; *nis-č<sup>h</sup>e* нислээ ‘to fly-DPST’; *č<sup>h</sup>ix-e* чихээ ‘ear-RFL’.

#### 8.6.4 *Proto-Mongolic \*u?*<sup>6</sup>

None of the sources indicates a back high unrounded vowel *\*u*, and we do not reconstruct it for Old Mongolian. This vowel, often written *i*, is reconstructed in back-vocalic words by most Mongolists, however.

One reason for reconstructing this vowel is the asymmetry of the vowel system, and particularly of vowel harmony, where *\*i* was completely neutral, occurring in both back-vocalic and front-vocalic words. If *\*i* were originally *\*u* in back-vocalic words, the Mongolic vowel system would be the same as the Turkic one, and vowel harmony would be more regular.

Another argument that has been given for the existence of Proto-Mongolic *\*u* is the fact that the combination reconstructed here as *\*/k<sup>h</sup>i/* was written in two different ways in Uigur Mongolian, as 𐰃 (𐰄) <qi> in back-vocalic, and as 𐰇 <ki> in front-vocalic words. Our interpretation is that the letters 𐰃 (𐰄) and 𐰇 represent different allophones, uvular *\*[q<sup>h</sup>]* and velar *\*[k<sup>h</sup>]*, of a phoneme *\*/k<sup>h</sup>/*. The uvular variant occurs in words with back vowels and the velar one in words with front vowels. The vowel *\*i* is neutral and can occur in both types of words. It can thus be preceded by either *\*[q<sup>h</sup>]* or *\*[k<sup>h</sup>]*, depending on whether the other vowels of the word are back or front. Since all sources denote the *\*i* vowel in the same way in all types of words, we will assume that there was only one *\*i* vowel, which was truly neutral. Many researchers have, however, assumed that there was a vowel difference as well, so that Uigur Mongolian 𐰃 (𐰄) and 𐰇 were pronounced as [q<sup>h</sup>u] and [k<sup>h</sup>i], respectively.

In later stages of Written Mongolian, 𐰃 (𐰄) <qi> is replaced by 𐰇 <ki> in back-vocalic words, and this is one of the main differences between Uigur Mongolian and Classical (or Modern) Written Mongolian. Our interpretation of this is that the uvular allophone [q<sup>h</sup>] was replaced by velar [k<sup>h</sup>] before *i* in back-vocalic words (but was retained in other positions).

The combination reconstructed as *\*/ki/* was written in the same way as *\*/k<sup>h</sup>i/* in Uigur Mongolian, and the same reasoning can be applied, although there are rather few examples in the Old Mongolian material. In addition to Uigur Mongolian, Arabic Mongolian is fairly consistent in the use of uvulars before *i* in back-vocalic words, while 'Phags-pa Mongolian vacillates. Sino-Mongolian writes only velars before *i* (18).

(18) Examples of *\*/k<sup>h</sup>i/* and *\*/ki/*

	OM	UM	SM	AM	Ph	
<i>*[k<sup>h</sup>i]</i>	<i>*k<sup>h</sup>i</i>	ki	k <sup>h</sup> i	ki	k <sup>h</sup> i	'to do'
		<i>*setk<sup>h</sup>il</i>	sadkil	<i>set<sup>h</sup>k<sup>h</sup>il</i>	sitkil	<i>sedk<sup>h</sup>il</i>
<i>*[ki]</i>	<i>*č<sup>h</sup>injkis</i>	činkkiz	č <sup>h</sup> injkis		jingis	'Chinggis'

<sup>6</sup> For notes and sources, see App. H, 8.6.4, p. 224.

(18) (*cont.*)

	OM	UM	SM	AM	Ph	
*[q <sup>h</sup> i]	*k <sup>h</sup> ičahar	qičaqar	k <sup>h</sup> ičaar	qižar	k <sup>h</sup> ižaar	'border'
	*čok <sup>h</sup> i	juqi	čewk <sup>h</sup> i	juqi	joqi	'to fit'
*[qi]	*aŋkita	ankqida	aŋkita	ankda	aŋgide	'separate'
	*čalki		čalki	jalb̥i		'to swallow'

## 8.7 OLD MONGOLIAN CONSONANTS

Old Mongolian had the maximal syllable structure CVC. The consonants which occur as syllable onsets are shown in (19). Coda consonants are treated in section 8.7.4.

(19) *Old Mongolian onset consonants*

voiceless aspirated stops/affricate		t <sup>h</sup>	č <sup>h</sup>	k <sup>h</sup>		
voiceless unaspirated stops/affricate	p	t	č	k		
voiceless fricatives		s			h	
nasals	m	n				
lateral		l				
vibrant		r				
glide		j				

The correspondences on which this reconstruction is based are given in (20), and examples are given in Table 8.3. The velar stops /k/ and /k<sup>h</sup>/ have uvular allophones \*[q] and \*[q<sup>h</sup>] in back-vocalic words; they are shown separately since they are treated separately in all sources. Similarly, initial and medial \*h are shown separately.

(20) *Correspondences for Old Mongolian onset consonants*

The reflex š of \*s occurs before \*i.

OM	*t <sup>h</sup>	*č <sup>h</sup>	*[k <sup>h</sup> ]	*[q <sup>h</sup> ]	*p	*t	*č	*[k]	*[q]
UM	t, d	č	k	q	b	t, d	j, č	k	q
SM	t <sup>h</sup>	č <sup>h</sup>	k <sup>h</sup>	χ	p	t	č	k	χ
AM	t	ž	k	q	b	d	ž	k	β
Ph	t <sup>h</sup>	č <sup>h</sup>	k <sup>h</sup>	q	b	d	ž	g	q
OM	*s	*h-	*-h-	*m	*n	*l	*r	*j	
UM	s	Ø	k, q	m	n	l	r	j	
SM	s/š	x	Ø	m	n	l	r	j	
AM	s/š	h	Ø	m	n	l	r	j	
Ph	s/š	h	Ø, '	m	n	l	r	j	

TABLE 8.3 *Examples of Old Mongolian onset consonants*

	OM	UM	SM	AM	Ph	
*t <sup>h</sup>	*t <sup>h</sup> aulai	taulai	t <sup>h</sup> awlaj	taulai	t <sup>h</sup> awlai	'hare'
	*alt <sup>h</sup> an	aldan	alt <sup>h</sup> an	alt <sup>h</sup> an	alt <sup>h</sup> an	'gold'
*č <sup>h</sup>	*č <sup>h</sup> erik	čarik	č <sup>h</sup> erik <sup>h</sup>	jirik	č <sup>h</sup> erig	'soldier'
	*napč <sup>h</sup> in	nabčin	napč <sup>h</sup> in	nabčin	nabč <sup>h</sup> in	'leaf'
*k <sup>h</sup> [k <sup>h</sup> ]	*k <sup>h</sup> ei	kai	k <sup>h</sup> ej	kiji	k <sup>h</sup> ei	'wind'
	*nok <sup>h</sup> er	nykur	nok <sup>h</sup> ar	nukr	nok <sup>h</sup> ør	'friend'
*k <sup>h</sup> [q <sup>h</sup> ]	*k <sup>h</sup> ura	qur-a	χura	qura	qura	'rain'
	*kak <sup>h</sup> ai	qaqai	χaxaj	qaqai	qaqai	'pig'
*p	*pič <sup>h</sup> i	biči	pič <sup>h</sup> i	bijí	bič <sup>h</sup> i	'to write'
	*japu	jabu	japu	jabu	jabu	'to go'
*t	*tørpen	tyrban	torpen	durban	dørbe	'four'
	*ertem	erdam	ertem	'irdm	irdem	'learning'
*č	*čok <sup>h</sup> i	juqi	čewk <sup>h</sup> i	juqi	joqi	'to fit'
	*k <sup>h</sup> ičahar	qičaqrar	k <sup>h</sup> ičaar	qijar	k <sup>h</sup> ičhaar	'border'
*k [k]	*ker	kar	ker	kir	ger	'house'
	*yke	yka	uke	'uka	'ye	'word'
*k [q]	*kačar	qačar	χačar	qačar	qačar	'ground'
	*čirkohan	jirquqan	čirxoan	jirxuan	jirqo'an	'six'
*s [s]	*sur	sur	sur	sur	sur	'to learn'
	*t <sup>h</sup> osun	tusun	t <sup>h</sup> osun	tusun	t <sup>h</sup> osun	'fat'
*s [š]	*sini	sini	šini	šini	šine	'new'
	*masi	masi	maši	maši	maši	'very'
*h	*hon	un	xon	hun	hōn	'year'
	*tehere	takar-a	teere	dira	deere	'above'
	*ahula	aqla	aula	'ula	a'ula	'mountain'
*m	*morin	murin	morin	murin	morin	'horse'
	*amin	amin	amin	amin	amin	'life'
*n	*nere	nar-a	nere	nirə	nere	'name'
	*k <sup>h</sup> oina	qujiňa	χoina	quina	qojina	'back'
*l	*t <sup>h</sup> aulai	taulai	t <sup>h</sup> awlaj	taulai	t <sup>h</sup> awlai	'hare'
	*yile	yila	ujile	'uilə	yile	'deed'
*r	*morin	murin	morin	murin	morin	'horse'
	*nere	nar-a	nere	nirə	nere	'name'
*j	*japu	jabu	japu	jabu	jabu	'to go'
	*k <sup>h</sup> ojar	qujar	χojar	qujar	qojar	'two'

8.7.1 *Stops and affricates*<sup>7</sup>

We reconstruct two series of Old Mongolian stops and affricates: voiceless aspirated and voiceless unaspirated. There are five places of articulation, labial (\*p), dental (\*t<sup>h</sup>, \*t), alveopalatal (\*č<sup>h</sup>, \*č), velar (\*k<sup>h</sup>, \*k), and uvular (\*q<sup>h</sup>, \*q). The

<sup>7</sup> For notes and on stops and affricates, see App. H, 8.7.1, p. 224.

uvulars are allophones of the velars, occurring in back-vocalic words. In most earlier reconstructions, the two series of stops and affricates are written with symbols for voiceless and voiced consonants, corresponding to our voiceless aspirated and voiceless unaspirated, respectively. While some authors say that the Old Mongolian consonant series were phonetically voiceless and voiced, others use terms as fortis ~ lenis or strong ~ weak.<sup>8</sup> Our reconstruction corresponds to that given by Poppe (1955) as shown in (21). Poppe's \*g/y corresponds both to our \*k and to our medial \*h (see 8.7.2 below).

(21) *Comparison of reconstructions*

<i>Our</i>	<i>Poppe</i>	<i>Our</i>	<i>Poppe</i>
		*p	b
*t <sup>h</sup>	t	*t	d
*č <sup>h</sup>	č	*č	ž
*k <sup>h</sup> [k <sup>h</sup> ]	k	*k [k]	g
*k <sup>h</sup> [q <sup>h</sup> ]	q	*k [q]	y

The two series are distinguished clearly in Sino-Mongolian (aspirated ~ unaspirated) and 'Phags-pa (aspirated ~ voiced), except for the uvular stops. Arabic Mongolian differentiates the two series only for dental and uvular stops (voiceless ~ voiced), and Uigur Mongolian writes the two series in the same way except for the alveopalatal affricate when it is word-initial (č ~ j).

The reason for assuming that the Old Mongolian series were aspirated ~ unaspirated rather than voiceless ~ voiced is that aspiration is involved in Sino-Mongolian and 'Phags-pa Mongolian, and also that most modern languages have an aspirated ~ unaspirated contrast where voicing is only marginally involved. Another argument for this analysis is that the first series has a more limited distribution, not occurring in syllable codas (see 8.7.4), suggesting that it is more marked than the second one (cf. Janhunen 1990a: 38). It is highly unlikely that the voiceless member of a voiceless ~ voiced pair is the more marked one, but likely that the aspirated member of an aspirated ~ unaspirated pair is, and for this reason the voiceless ~ voiced interpretation is less probable. As will be seen in section 10.10, some historical developments suggest that the Old Mongolian aspirated stops were preaspirated, perhaps with the same distribution as in modern Halkh, that is, postaspirated word-initially and preaspirated in other positions (see Svantesson 2003a).

All sources distinguish velar and uvular stops. They alternate with vowel harmony, so that the velars \*[k<sup>h</sup>], \*[k] occur only in words with front vowels, and the uvulars \*[q<sup>h</sup>], \*[q] only in words with back vowels (8.6.2). Since velars and uvulars thus stand in complementary distribution, we will regard each velar ~ uvular pair as the allophones of one phoneme, which we write with the symbol for the velar: \*/k<sup>h</sup>/, \*/k/ (cf. Poppe 1960a: 10; 1976; Hattori 1972; Buraev 1987a: 30). As seen in section 8.6.4, both velars and uvulars combine with a following \*i, so there is a

<sup>8</sup> See the review of the literature in App. H, p. 224–5.

potential contrast between velars and uvulars in this position. As far as we know, no minimal pairs exist, so this potential contrast is at most marginal.

The dental stops  $*t^h$  and  $*t$  do not occur before  $*i$  in Old Mongolian. They had probably become affricates,  $*č^h$  and  $*č$ , in this position already in Pre-Mongolic.

### 8.7.2 *The fricative $*h$* <sup>9</sup>

We reconstruct a fricative  $*h$  both word-initially and medially between vowels. Initial  $*h$  corresponds to zero in Uigur Mongolian,  $x$  in Sino-Mongolian, and  $h$  in 'Phags-pa and Arabic Mongolian, while medial  $*h$  corresponds to  $k$  or  $q$  (depending on vowel harmony) in Uigur Mongolian, and to zero in Sino-Mongolian, Arabic Mongolian, and 'Phags-pa Mongolian; see (20). Although initial and medial  $*h$  have somewhat different reflexes, there are good reasons for analysing them as variants of the same phoneme, as pointed out by Janhunen (1999). Both are represented as zero in some of the Old Mongolian sources, and in the other sources they are represented as velar, uvular, or laryngeal consonants. Although the exact phonetic nature of this consonant cannot be determined, we write it as  $*h$ , since it is a weak consonant which disappeared in most modern languages; Janhunen writes it as  $*x$ .

Since this reconstruction is a controversial issue in Mongolic historical phonology, we will motivate it in some detail. The root of the problem is the fact that the sounds represented by the Uigur Mongolian letters  $\pi$  <q> and  $\Omega$  <k> in inter-vocalic position may develop in three different ways in the modern languages, for example Halkh. This is illustrated in (22). The words in (a) have the reflex  $x$  in Halkh, those in (b) have  $g/g$ , and those in (c) have a zero reflex. The reflexes in the other Old Mongolian sources are also shown in (22).

#### (22) Intervocalic uvulars/velars in Uigur Mongolian

In addition to transliterated Uigur Mongolian, Classical Written Mongolian (WM) forms are given. The letter  $\pi$  <q> occurs in back-vocalic words and  $\Omega$  <k> in front-vocalic. The forms with the letter  $\pi$ , traditionally transcribed  $y$ , occur in Classical Mongolian but usually not in Uigur Mongolian.

	UM	WM	Halkh		SM	AM	Ph	
(a)	nuqai	奴 <sup>乞</sup> 爾	نوخاي	нохой	noχaj	nuqai	noqōi	'dog'
	yku-	ي <sup>ك</sup> و-	ux	yx	uk <sup>h</sup> u	'uku	yk <sup>h</sup> u	'to die'
(b)	muqai	مۇقاي	مۇغاي	могой	moχaj	muqai	moqōi	'snake'
	yka	ي <sup>ك</sup> ا	ug	үг	uke	'uka	'yge	'word'
(c)	aquila	ئۇلۇغا	وۇڭ	үүл	aula	'ula	a'ula	'mountain'
	takar-a	تاكارا	تەر	دەэр	teere	dira	deere	'above'

<sup>9</sup> See the survey of the literature in App. H, 8.7.2, p. 225.

As shown in (20), we reconstruct  $*k^h$  ( $*[q^h, k^h]$ ) for the correspondence in (22a),  $*k$  ( $*[q, k]$ ) in (b), and  $*h$  in (c), that is, three different consonant phonemes. This provides a straightforward explanation for the different behaviours of the intervocalic uvulars/velars in words such as ‘snake’ and ‘mountain’. In our reconstruction these words are *\*mokai* (> Halkh *mɔgoi*) and *\*ahula* (> Halkh *uvɔʃ*), and the different consonants motivate their different developments.

Many earlier reconstructions, including Poppe (1955), follow Classical Written Mongolian, where the traditional transcription is *\*q/k* in case (a), and *\*y/g* in both (b) and (c) (cf. (21)). This reconstruction is problematic since it does not differentiate cases (b) and (c). For example, the words ‘mountain’ and ‘snake’ are *\*ayula* and *\*moyai* in this reconstruction, and to explain the different developments it is necessary to specify environments where intervocalic *\*y/g* are lost or are retained. Ramstedt (1902: 22) says that this may have to do with different accentuation; Ramstedt (1912; 1957: 88) and Vladimircov (1929: 216) make the more precise assumption that these consonants are lost when they preceded a vowel with secondary stress, and are retained in other positions. Both Ramstedt and Vladimircov assume that the consonants were different as well, a fricative in the first case and a stop in the second. According to this assumption, words like *\*ayula* had a secondary stress on the second vowel, but *\*moyai* did not. This assumption is a bit circular, however, since there is no other evidence for secondary stress than the different developments of the consonants. Several researchers have connected this assumption with the hypothesis that Proto-Mongolic had primary long vowels (8.5.1), and proposed that the conditioning factor was not stress but phonological length of the following vowel, so that these intervocalic stops were lost in ‘weak position’, that is, before a primary long vowel, but were retained in ‘strong position’, that is, before a short vowel (Hattori 1959; Poppe 1959; 1960a: 40f.; 1961; 1962; 1967; Ligeti 1964) (see also Murayama 1970). Poppe (1960a) relates the two hypotheses by saying that the primary long vowels developed from vowels which carried a tone accent (*musikalischer Ton*).

Although there is little direct evidence in the Mongolic data for the hypothesis that long vowels caused the loss of a preceding uvular/velar, it gets some support from comparison with Junggar Tuvan (Kök Mungchaq), a Turkic language spoken in Xinjiang (Coyijongjab 1982b; 1985; Möngkebuan 2000a). According to Coyijongjab, this language has preserved archaic phonological features in numerous loans from Mongolic. Some words which correspond to Old Mongolian words with a *\*VhV* group have the group *VhVV* in Junggar Tuvan, for example *baruħuuun* ‘right’, *dʒaluħuuu* ‘young’, and *xahaalga* ‘gate’ (OM *\*parahun*, *\*čalahu*, *\*k<sup>h</sup>ahalka*). Rather few words with this type of correspondence have been found, however; furthermore, other researchers analyse the Junggar Tuvan data differently: Mawkanuli (1999) gives the cited words as *baruuun*, *žalunu*, *xalga*.

As mentioned above, Ramstedt and Vladimircov reconstructed different Old Mongolian consonants for the lost and retained Classical Mongolian uvulars/velars, but regarded them as allophones conditioned by the accentuation or length of the following vowel. Poppe (1960a: 41, 46) says that Proto-Mongolic had fricatives *\*y* and *\*w* in ‘weak position’, that is, before a long vowel, and stops in ‘strong

position', before a short vowel. Hattori (1939) reconstructs a fricative  $*\beta$  for our  $*h$ , and stops  $*g/g$  for our  $*k$ ; Street (1957b) makes a similar proposal.

In our opinion, the only possibility for Old Mongolian as we define it, is to regard the disappearing and retained 'weak' uvulars/velars as reflexes of different consonants since they have different reflexes in the Old Mongolian sources, except Uigur Mongolian. The alternative with the same consonant but different conditioning environments must be rejected since there is no independent internal evidence for the existence of long (or stressed) vowels in the required positions.

One problem with reconstructing the disappearing uvular/velar as a separate Old Mongolian consonant is its limited distribution, appearing only in intervocalic position. Identifying it with initial  $*h$  eliminates this problem at least partially, since  $*h$  then occurs in any syllable onset position, except immediately after another consonant.

There are some direct indications that the consonant we reconstruct as Old Mongolian intervocalic  $*h$  is the reflex of an earlier (Pre- or Proto-Mongolic) uvular/velar or a labial, or perhaps of both. One such indication is a number of words which have reflexes of  $*h$  in some modern languages but reflexes of  $*k$  in others. These include OM *\*suhu* 'armpit', with reflexes of  $*h$  in Chahar (*suu*), Baarin (*suv*), and Kalmuck (*sy*), but reflexes of  $*k$  in Halh (*sug cyra*) and Buriad (*huga*); similarly, OM *\*kʰičahar* 'border' has reflexes of  $*h$  in Buriad (*x'izar*) and Kalmuck (*kʰizer*), but the Halh form (*x'acgar* хязгаар) has the reflex of  $*k$ . Another indication of this relation is that intervocalic  $*h$  appears as *g* in some Tungusic loanwords (Poppe 1972a; Doerfer 1985b).

Some words with OM  $*h$  show reflexes of  $*p$  as well, for example, OM *\*tehel* 'gown', which is *dewl* in Kalmuck (< $*p$ >), *degal* in Buriad (< $*k$ >), and *teež* дээл in Halh (< $*h$ >). This word is written with Θ <b> in Classical Mongolian but with Ω <k> in Uigur Mongolian. The word 'self' is written with <b> in Uigur Mongolian (*ybar*), but has zero reflexes in Sino-Mongolian (*oer*), Arabic Mongolian ('ur), and 'Phags-pa Mongolian ( $\emptyset$ 'er), so that Uigur Mongolian suggests the Old Mongolian form *\*ph̥er*, and the other sources suggest *\*ph̥her*. Facts like these, and also comparison with languages outside Mongolic, have led to the assumption that at least some occurrences of intervocalic  $*h$  have developed from an earlier unaspirated  $*p$  (usually written  $*b$ ), or that one dialect of Old Mongolian retained  $*p$  while it developed to  $*k$  ( $*y/g$  in Poppe's notation) in others (Poppe 1960a: 41ff.; Thomsen 1987; Ozawa 1997; Janhunen 1999). Bulag (1983; 1985; 1993a; 1996) reconstructs Proto-Mongolic (or Pre-Mongolic)  $*p$  for our intervocalic  $*h$ , and  $*q/k$  for our  $*k$ .

Initial  $*h$  disappeared in Mongolian, Buriad, Kamnigan, Oirad, and Moghol, but is retained as *h*, *x* or *š* in the other Mongolic languages (see 10.8.3). Ramstedt (1916–20; 1957: 39ff.) and Pelliot (1925; 1944) proposed the hypothesis that this consonant was  $*p^h$  (usually written  $*p$ ) in Proto-Altaic, and then developed to zero in Modern Mongolian via intermediate stages with  $*f$  or  $*h$ . This is known as Ramstedt–Pelliot's law. Some Mongolists reconstruct  $*p^h$  for Proto-Mongolic.<sup>10</sup> This hypothesis is based on comparison with other Altaic languages, and on evidence

<sup>10</sup> See the survey of the literature in App. H, 8.7.2, p. 225.

from Mongolic loans in Tungusic and Turkic languages, but has little support from the Old Mongolian sources or the modern Mongolic languages. In our opinion,  $*p^h$  cannot be reconstructed at the Old Mongolian (or even Proto-Mongolic) stage.

In conclusion, reconstructing the disappearing uvular/velar stop in Uigur Mongolian as a separate Old Mongolian phoneme is the only reasonable solution, given the Old Mongolian sources. Furthermore, identifying this consonant with initial  $*h$  solves a number of problems in Mongolic historical phonology.

### 8.7.3 Sonorants and $*s$

The Old Mongolian sonorants  $*m$ ,  $*n$ ,  $*l$ ,  $*r$ ,  $*j$  agree between all sources, and have not changed much even in the modern languages. As is still basically the case in modern Mongolian, the liquids  $*l$  and  $*r$  cannot occur word-initially (Vladimircov 1929: 366; Poppe 1955: 155, 160; Darbeeva 1996: 88ff.).

The sibilant  $*s$  is represented by  $\check{s}$  before  $*i$  in Sino-Mongolian, Arabic Mongolian, and 'Phags-pa Mongolian, and also in a few Uigur Mongolian texts. The alveopalatal  $*[\check{s}]$  can be regarded as an allophone of  $*s$  before  $*i$  in Old Mongolian (cf. Poppe 1960a: 29). It was introduced in other positions in early loans, however, potentially contrasting with  $*s$ . One example is the word  $\check{s}asin$  བ୍ରତ୍ୟୁସନ୍ ‘religion’ in 'Phags-pa Mongolian (Text P13:2; see 8.9), ultimately from Sanskrit *śāsana*.

### 8.7.4 Coda consonants

The coda position is more restricted than the onset position, the main difference being that the affricates and the aspirated stops do not occur as codas (A. A. Bobrovnikov 1849: 12ff.; Vladimircov 1929: 408; Poppe 1960a: 40; Cydenžapov 1973). The velar nasal  $*ŋ$  is the only consonant that does not occur in syllable onsets but only in codas. The coda consonants are given in (23).

#### (23) Old Mongolian coda consonants

voiceless stops	p	t	k
voiceless fricative		s	
nasals	m	n	ŋ
lateral		l	
vibrant		r	

The correspondences on which this reconstruction is based are given in (24), and examples in (25).

#### (24) Old Mongolian coda consonants

OM	*p	*t	*[k]	*[q]	*s	*m	*n	*ŋ	*l	*r
UM	b	t	k	q	s	m	n	nk	l	r
SM	p	t <sup>h</sup>	k <sup>h</sup>	x	s	m	n	ŋ	l	r
AM	b	d, t	k	q	s	m	n	n(q)	l	r
Ph	b	d	g	q	s	m	n	ŋ	l	r

## (25) Examples of coda consonants

	OM	UM	SM	AM	Ph	
*p	*ap	ab	ap	ab	ab	'to take'
	*napč̥in	nabčin	napč̥in	nabčin	nabč̥in	'leaf'
*t	*morit	murit	molith	murid	morid	'horses'
	*setkhil	sadkil	setkhil	sitkil	sedkhil	'mind'
*k [k]	*č̥erik	čarik	č̥erikh	žirik	č̥erig	'soldier'
	*pič̥ik	bičik	pič̥ikh	bijik	bič̥ig	'letter'
*k [q]	*č̥ak	čaq	č̥ax	jaq	č̥aq	'time'
	*pulak	bulaq	pulax-	bulaq	bulaq	'spring'
*s	*urus	urus	urus	urus	urus	'to flow'
	*pos	bus	pos	bus	bôs	'to rise'
*m	*ertem	erdam	ertem	'irdm	irdem	'learning'
	*khamt̥bu	qamtu	χamthu	qamtu	qamthu	'together'
*n	*hon	un	xon	hun	hôn	'year'
	*yntyr	yndur	untur	'undur	yndur	'high'
*ŋ	*tyhyreŋ	tykurank	tuureŋ	duran		'full'
	*miŋkhan	minkqan	minχan	mnqan	miŋqan	'thousand'
*l	*øŋke	ynkka	oŋke	'unka	øŋge	'colour'
	*monkal	munkqul	marykol	mnkul	mônqol	'Mongol'
*r	*alt̥an	aldan	alθan	altan	alθan	'gold'
	*khojar	qujar	χojar	qujar	qojar	'two'
	*urt̥u	urtu	urt̥u	'urtu	urt̥u	'long'

There were no complex codas in Old Mongolian, except in some loans such as \*pars 'tiger' (from Persian).

The nasals \*n and \*ŋ cannot precede non-homorganic stops within a word (cf. Ramstedt 1913), but \*m can precede dentals (as in \*tumta 'middle') or velars (\*nimken 'thin'). In word-final position, all three nasals occur.

Many Old Mongolian nouns and numerals ended in 'unstable' \*n, which appeared in some forms but not in others (see 10.9.1).

## 8.8 MORPHOPHONOLOGICAL PROCESSES

Except for vowel harmony, there are rather few morphophonological processes in Old Mongolian. There are usually no changes in the stems when suffixes are added. One exception is that word-final \*k becomes weakened to \*h before the plural suffix \*-ut (-ut/yt) (but cf. Tömörtogoo 1990). Examples are \*č̥erik 'soldier', plural \*č̥erih-yt and \*aimak 'district', PL \*aimah-ut. Weakening does not take place before case suffixes, however. For example, the genitives of these words are \*č̥erik-yn and \*aimak-un. This suggests that plural and case suffixes have different status in the morphology. It could be mentioned that the plural suffix is usually written joint to the stem in Uighur Mongolian, but case suffixes are written separately.

Another indication that case suffixes are clitic-like and not fully integrated in the words is the fact that unlike stem-internal \**s* before \**i*, stem-final \**s* is not pronounced \*[ʃ] when a suffix beginning with \**i* is added. Examples are OM \**ulus-i* ‘state-ACC’ (SM *ulusi*, AM *'ulusi*), and \**yile-s-i* ‘deed-PL-ACC’ (SM *ujilesi*, Ph *yilesi*).

It is more common that suffixes vary with the stems. In particular, many suffixes have different forms depending on whether the stem ends in a vowel or a consonant. These variations are rather complicated and differ between the sources. For a detailed account of this, we refer to Weiers (1969), and for Classical and Modern Written Mongolian to Poppe (1954a).

## 8.9 OLD MONGOLIAN VOCABULARY

All Old Mongolian words used as examples are given in this vocabulary together with the sources on which the reconstructions are based.

The stems of words are given (for verbs, the stem is identical to the imperative). If the stem does not form a graphic unit in a source, an inflected form is given. For each word, normally only one form from one source of each kind is given. The variation which sometimes occurs is usually irrelevant for our purposes and is not accounted for (see especially Weiers 1969 for this). Unstable \**n* (10.9.1) is shown as /*n*.

The different Old Mongolian sources are discussed in section 8.1–4. The abbreviations used in the vocabulary are given below. When known, the year of the source is given.

### *Uigur Mongolian*

Texts from Dobo (1983b):

D1	1227	Chinggis Khan's stone
D2	1240	Edict of Ögödei
D3	1246	Edict of Güyüg
D4	1257	Stone inscription to Möngke Khan
D5	1267/89	Abaga's letter
D6	1289	Argun's letter to Philippe le Bel
D7	1290	Argun's letter to Pope Nicholas IV
D8	1302	Qasan's letter to Pope Bonifacius VIII
D9	1305	Öljeitü's letter to Philippe le Bel
D10	1307	Translation of the <i>Book of filial piety</i> ( <i>Xiaojīng</i> 孝經)
D11	1312	Commentary to <i>Bodhicaryāvatāra</i>
D12	1335	Inscription in memory of Zhāng Yìngruì 張應瑞
D13	1338	Inscription in memory of Jigüntei
D14	1340	Inscription of Arug, Prince of Yunnan
D15	1346	Xīngyuángé 興元閣 inscription
D17	1362	Inscription in memory of prince Hindu

D19	14C	Fragments of the <i>Alexander romance</i>
D20	1453	Edict of 1453
D21	1580	Altan Khan's letter
D22	15C	Ming dynasty edicts

Turfan texts (Cèrènsodnom and Taube 1993):

T24		<i>Bhadracaryā-praṇidhāna-rāja</i>
T25	early 14C	<i>Mañjuśrīnāmasaṃgīti</i>
T29, 30	early 14C	<i>Mahākālī</i> hymn
T34		Poem
T36		Text on the consequences of sin
T50, 51, 61	13/14C	Calendar fragments
T68	1369	Tax exemption document
T70		Tax document
T80, 82		Text fragments

#### *Sino-Mongolian*

N	1228	<i>Secret history of the Mongols</i> (Kuribayashi and Coyijongjab 2001)
HY	1389	<i>Hua-Yi yiyu</i> (Kuribayashi 2003)

#### *Arabic Mongolian*

M	14 C	<i>Muqaddimat al-adab</i> (Poppe 1938–9).
IM	14C	ibn-Muhannā (Poppe 1938–9)
L	1343	Leiden Manuscript (Poppe 1927–8)

#### *'Phags-pa Mongolian*

Texts from Poppe (1957) (P) or Žančiv (2002) (Z):

P1 (Z1)	1276	Edict of Mangala
P2 (Z17)	1314	Edict of Buyantu Khan
P4 (Z23)	1321	Edict of Empress Dowager Dagi
P7 (Z40)		Minusinsk <i>páizi</i>
P11 (Z51(2))		<i>Subhāśitaratnanidhi</i> fragment
P12 (Z38)	1345	Jūyōngguān 居庸關 inscription (east)
P13 (Z39)	1345	Jūyōngguān inscription (west)
Z2	1277/89	Edict of Qubilai Khan
Z4	1277/89	Edict of Qubilai Khan
Z5	1280/92	Edict of Qubilai Khan
Z8	1298	Edict of Öljeitü Khan
Z10	1303	Edict of Prince Seüse
Z11	1305	Edict of Prince Qaisan
Z12	1306	Edict of Öljeitü Khan
Z14	1313	Edict of Buyantu Khan
Z15	1314	Edict of Buyantu Khan
Z18	1314	Edict of Buyantu Khan
Z21	1318	Edict of Buyantu Khan

Z22	1320	Edict of Empress Dowager Dagi
Z25	1323	Edict of Gegen Khan
Z26	1324	Edict of Yisüntemür
Z28	1328	Edict of Yisüntemür
Z29	1335	Edict of Togontemür
Z32	1343	Edict of Togontemür
Z34	1351	Edict of Togontemür
Z36	1368	Edict of Togontemür
Z51		<i>Subhāśitaratnanidhi</i> fragments
Z53		Printed text fragment
Z59		Name inscription

- \**ačʰi(h)an* ‘burden’. SM 阿赤阿納 *ačʰian-a* [DAT] N274/12:27; AM اجاان *ačaaŋ* M94b.
- \**ahula* ‘mountain’. UM ᠠ ula aqula D15:25; SM 阿岷刺 *aula* N118/3:30; AM او لا *ula* M372a; Ph ᠠ ᠥ ᠤ a'ula P2:20.
- \**aimak* ‘district’. UM ᠠaimaq aimaq T70r15; SM 阿亦馬 *aimax* N156/5:25, 阿亦馬 *aimax-un* [GEN] N156/5:25; Ph ᠠaimaq aimaq P4:4.
- \**aima(h)ut* ‘districts’. SM 阿亦馬兀答察 *aimaut-ačʰa* [ABL] N156/5:25; Ph ᠠaima'ud-un aimau'ud-un [GEN] P4:4.
- \**akʰa* ‘elder brother’. UM ᠠ aqa D9:27; SM 阿中合 *ačxa* N18/1:11; AM اقا *aqa* M303b; Ph ᠠ aqa Z10:11.
- \**alak* ‘motley’. UM ᠠalaq-čin alaq-čin [DER] D12:50; SM 阿刺 *alax* N100/2:44; AM الا *ala* M97a.
- \**ali* ‘which’. UM ᠠ ali D6:24; SM 阿里 *ali* N205/8:37; AM الی *ali* M98b; Ph ᠠ ali Z5:27.
- \**alima* ‘fruit’. SM 阿里麻 *alima* HY1:4a; AM الماء *alma* IM432a; Ph ᠠ اليماء alima P12:7.
- \**altʰa/n* ‘gold’. UM ᠠaldan aldan D17:4; SM 阿勒壇 *altʰan* N117/3:27; AM التن *altan* M385a; Ph ᠠالدان *altʰan* P12:5.
- \**ama/n* ‘mouth’. UM ᠠaman aman D17:27; SM 阿蠻 *aman* N87/2:25; AM امان *aman* M99b.
- \**ami/n* ‘life’. UM ᠠamin amin D12:21; SM 阿民 *amin* N55/1:35; AM امين *amin* M100b; Ph ᠠامين *amin* P13:12.
- \**ajkita* ‘separate’. UM ᠠankida ankida D10:27a5; SM 昂吉答 *ajkita* N92/2:33; AM انکدا *ankda* L1258; Ph ᠠانکدا *ajgide* P2:20.
- \**ap* ‘to take’. UM ᠠبـ ab-ču [IPFG] D12:21; SM 阿卜 *ap* N13/1:8; AM ابو بـ *ab-uba* [PST] M94a; Ph ᠠاب *ab* P2:21.
- \**arihun* ‘clean’. UM ᠠاریون ariqun D13:21; SM 阿里溫 *aliun* HY1:28a; AM اريون *ariun* M105b.
- \**arka* ‘method’. UM ᠠارق arq-a D11:162b8; SM 阿声兒中合 *arχa* N208/8:45; AM ار غه *arqa* M105a.
- \**čahu* ‘to bite’. UM ᠠجاو jaqu-qsan [PSTP] T29:6; SM 札兀 *čau* N140/4:27; AM جاو *čau* M203b.

- \*čauhū/n ‘hundred’. UM چاون jaun D11:156b11; SM 札溫 čaun N185/6:52; AM چاون jawun M203b; Ph چاون ja’un Z36:42.

\*čalahu ‘young’. UM چالاچ jalaqu D13:20; SM 札刺為 čalauj N156/5:25; AM چلو jlu M200b.

\*čalki ‘to swallow’. SM 札勒吉 čalki N78/2:11; AM چالخیبہ žalxī-baq [PST] M200b.

\*čaru ‘to use’. UM چارو چارو jaru-basū [COND] D11:159a3; SM 札舌魯 čaru N16/1:10; AM چارو چارو žaru-baq [PST] M133a.

\*čiha ‘to point’. UM چیقا چیقا jiqa-qsan [PSTP] D10:12b7; SM 只阿 čia N145/4:41; AM چا ja’aa M199a.

\*čikasul/n ‘fish’. UM چیکاسون jiqasun D22:35b2; SM 只<sup>中</sup>合速 čiχasu N75/2:7; AM چیکاسون žikasun M205b.

\*čil ‘year’. UM چیل jil D2:3; SM 只勒 čil N13/1:8; AM چیل žil L1274; Ph چیل žil P2:24.

\*čirkohah ‘six’. UM چیرکوان jirquqan D6:33; SM 只<sup>舌</sup>兒<sup>中</sup>豁安 čirχoan N133/4:13; AM چیرکوان žirkuān M207a; Ph چیرکوان žirqo’ān Z36:17, چیرکوان žirqo’ān-a [DAT] P1:21.

\*čiryke/n ‘heart’. UM چیرکا jiruka D17:18; SM 只<sup>舌</sup>魯格 čiruke N125/3:48; AM چوروکان žurukan M211b. [SM indicates \*k, but most modern languages indicate \*kʰ]

\*čita ‘spear’. UM چیده jida-z [PL] D19:13a10; SM 只苔 čita N72/2:3; AM چیده žida M205a.

\*čokhi ‘to fit’. UM چوکی juqi-qu [FUTP] D6:23; SM 勺乞 čewkhi N155/5:22; AM چوکی juqi-baq [PST] M208a; Ph چوکی žoqi P13:10.

\*čø(h)elen ‘soft’. SM 勺斡連 čewolen N189/7:10; AM چوولان žuulan M209a.

\*č[ø]lop ‘right’. UM چوب jub D7:15; SM چوپ čewp N20/1:12, 挑別察 čøp-ečʰa [ABL] N254/11:21; AM چوب žüb IM439b. [UM indicates \*o, and the e in the SM ablative form indicates \*ø. The modern languages indicate \*ø.]

\*čha(h)alsu/n ‘paper’. SM 察阿勘孫 čhaalsun N203/8:31; AM چالسون žalsun M131b.

\*čhak ‘time’. UM چاق čaq D11:157b14; SM 察黑 čhax N31/1:19; AM چاق žaq M130b; Ph چاک čhak-un [GEN] P13:9.

\*čhakan ‘white’. UM چاغان čaqaqan D11:167b7; SM 察<sup>中</sup>合安 čhayaan N203/8:31; AM چاغان žagan M130a; Ph چاغان čhagaan Z15:15.

\*čhasu/n ‘snow’. SM 察孫 čhasun N31/1:19; AM چاسون žasun M131a.

\*čhečhek ‘flower’. UM چاچاک čačak D21:26; SM 扯扯克 čhečhek HY1:4a; AM چیجاک žižak M133a.

\*čherik ‘soldier’. UM چاریک čarik D17:20; SM 扯舌里克 čherikʰ N100/2:44, 扯舌里昆 čherik-un [GEN] N194/7:29; 扯舌里吉耶兒 čherik-ijer [INST] N170/6:5; AM چیریک žirik M132a; Ph چیریک čherig P2:4, چیریک čherig-un [GEN] Z28:2.

\*čheriyh ‘soldiers’. UM چاریکوت čarikut D6:9; SM 扯舌里兀惕 čheriuth N101/2:46; Ph چیریکوت čheri’ud-un [GEN] P2:4.

\*čhikhi/n ‘ear’. UM چیکین čikin D15:30; SM 赤勤 čhikhin N138/4:24, 赤乞邊 čhikhi-pen [RFL] N254/11:25; AM چیقین žiqin M134b.

\*čhila(h)u/n ‘stone’. SM 赤老溫 čhilawun N72/2:3; Ph چیلا چیلا čhila’un P13:5.

- \*č̥ina ‘to boil’. SM 赤納 č̥ina N19/1:11; AM حینا jīna M133b.
- \*č̥in[ə]la ‘wolf’. UM ᠬᠢنᠳᠳ ‘čin’ čina T82v5; SM 赤那 č̥ino N78/2:11; AM حینا jīna M134a. [The modern languages indicate \*o]
- \*č̥(h)ijkis ‘Chinggis’. UM ᠬింకిజి ‘činkkiz’ D1:1; SM 成吉思 č̥ijkis N1/1:1; Ph چىڭىز jīngis P2:8. [UM and SM indicate \*č̥h, as does Halh; Ph indicates \*č̥]
- \*č̥isu/n ‘blood’. UM ᠬిసు ‘čisu-dan’ [DER] T30:12; SM 赤孫 č̥isun N145/4:38; 赤速班 č̥isu-pan [RFL] N254/11:25; AM جیسون jīsun M135a.
- \*č̥itkhør ‘devil’. SM 赤惕科兒 č̥itkhør HY1:16a; AM چتکر č̥tkr IM435a.
- \*eč̥hike ‘father’. UM ᠬిచికా ‘acika’ D7:8; SM 额赤格 eč̥hike N73/2:4; AM ايجيکا ijīka M151b.
- \*ehyte/n ‘door’. UM ᠬిదాన ‘ekudan’ D22:6a5; SM 额兀顛 euten N208/8:43; AM ايودان iudan M167b; Ph ئەدەن t’uden Z53:5.
- \*emehel ‘saddle’. UM ᠬిమాల ‘emakal’ D21:12; SM 额箇額emeel N80/2:15; AM ايمل iml M139b.
- \*emys ‘to wear’. UM ᠬిమాస ‘emus-basu’ [COND] D10:36a1; SM 额木思 emus N106/3:7; AM اموسپه amus-ba [PST] M233b.
- \*ene ‘this’. N62/1:43. UM ᠬిఏనా ‘aňa’ D2:1; SM 额捏 ene N62/1:43; AM اين ina M155b; Ph ئەن me Z5:29.
- \*epesyl/n ‘grass’. UM ᠬిపాసు ‘ebasun’ D13:4; SM 额別孫 epesun N24/1:15; AM ايباسون ibasun M150b.
- \*ertem ‘learning’. UM ᠬిర్డమ ‘erdam’ D13:5; SM 额舌兒點 ertem N189/7:10; AM ايردم irdm M161a; Ph ئەردىم irdem P13:10.
- \*ert̥e ‘early’. UM ᠬిర్డ ‘erda’ D10:9b1; SM 额兒帖 ert̥e N64/1:44; AM ايرتە irta M164b.
- \*harpal/n ‘ten’. UM ᠬిర్బాన ‘arban’ D5:14; SM 哈兒班 xarpan N53/1:33; AM هربان hrban M181b; Ph هاربان harban Z12:13.
- \*hič̥he ‘to be ashamed’. SM 希扯 xič̥he N244/10:31; AM هيچې hiji-ba [PST] M184b; Ph هيچي hič̥hu Z51(3)a:10.
- \*hiruhar ‘bottom’. UM ᠬిరుహార ‘irugar’ D19:9b1; SM 喜舌魯阿舌刺 xiruar-a [DAT] N199/8:10; AM هيروار hiruar M185b.
- \*hiryher ‘blessing’. UM ᠬిరుకార ‘irukar’ D14:14; SM 希舌魯額舌兒 xiruer N201/8:20; AM هيرار hirar M185b; Ph هيرار hiru'er P2:13.
- \*hoi ‘forest’. UM ᠬిఉ ‘ui’ D17:50; SM 槐 xoj N12/1:8.
- \*hon ‘year’. UM ᠬిఉన ‘un’ D12:15; SM 桓 xon N26/1:16; AM هون hun M185b; Ph هون hôñ Z34:28.
- \*hu(h)ut̥ha ‘bag’. SM 呼呼塔 xuxut̥ha HY1:10b; AM اوته ut̥a M372b.
- \*huja ‘to tie’. UM ᠬిఉజా ‘uja-ču’ [IPFG] D19:9a7; SM 忽牙 xuja N195/7:33; AM هويا huja M188a.
- \*hulahan ‘red’. UM ᠬిలాగా ‘ulaqan’ D20:20; SM 忽刺安 xulaan N81/2:17; AM هولان hulan M187a.
- \*hyk̥her ‘ox’. UM ᠬికార ‘ykar’ D6:31; SM 忽客兒 xuk̥her N100/2:44; AM اوکر ukr M377b; Ph هوكر hyk̥her Z2:19.
- \*hyneken ‘fox’. SM 忽捏堅 xuneken N247/11:1; AM هونakan hunakan M191b.
- \*hynesyl/n ‘ash’. SM 忽捏速 xunesu N87/2:25; AM هوناسون hunasun M191b.

- \**ilk(h)a* ‘to separate’. UM ئىلىقى ilqa-ču [IPFG] D19:13a6; SM 亦勒<sup>中合</sup> *ilxā* N139/4:25. [The modern languages indicate \*k]

\**ima(h)a/n* ‘goat’. SM 亦馬阿彌 *imaa-t<sup>h</sup>* [PL] N151/5:11; AM ايمانْ *ima'an* M153b.

\**ine(h)e* ‘to laugh’. SM 亦捏額 *inee* N189/7:9; AM اينَ *'ina* M196b.

\**ire* ‘to come’. UM ئارا ira-ksan [PSTP] D10:14a4; SM 亦舌列 *ire* N1/1:1; AM ايرا *ira* M197a.

\**irken* ‘people’. UM ئىركەن irkan D1:2; SM 亦兒堅 *irken* N5/1:3, 亦兒格捏 *irken-e* [DAT] N53/1:32; AM ايركانْ *irkan* M197b; Ph ئېرىڭ ئېرىن 'irgen-e' [DAT] Z18:8.

\**ite* ‘to eat’. UM ئىدا basu [COND] D10:36a3; SM 亦咥 ite N26/1:16; AM ايدا *ida* M194a; Ph ئېدى ئېدىن 'ide-gsen' [PSTP] Z51(4)b:7.

\**japu* ‘to go’. UM ئابۇجۇل jabu-qu [FUTP] D10:6a1; SM 逐步<sup>中</sup>忽 *japu-χu* [FUTP] N131/4:8; AM يابۇقو *jabu-qu* [FUTP] M98a; Ph ئابۇچۇل jabu-qu [FUTP] P12:4.

\**jasu/n* ‘bone’. UM ئاسۇن jasun D17:31; SM 牙孫 *jasun* N175/6:19; AM ياسون *jasun* M388a.

\**hek<sup>h</sup>e* ‘big’. UM ئاكا jaka D2:2; SM 也客 *hek<sup>h</sup>e* N46/1:27; AM ڪيڭ *jika* M388a; Ph ئاكا jike P2:2.

\**josu/n* ‘rule’. UM ئوچۇل jusu D9:34; SM 約孫 *josun* N9/1:6; Ph ئۆچۈل *josu* P2:22.

\**qačar* ‘ground’. UM ئاقا qacar D6:26; SM 中合札兒 *qačar* N9/1:6; 中合札舌刺察 *qačar-ač<sup>h</sup>a* [ABL] N146/4:45; AM غاجار *qačar* M173b; Ph ئاقا *qačar* P2:18.

\**kak<sup>h</sup>a* ‘single’. UM ئاقى qaqča D7:18; SM 中合黑察 *kak<sup>h</sup>a* N4/1:3; AM غافجه *qaqča* M175a; Ph ئاقى *qaqčha* P12:3.

\**kak<sup>h</sup>ai* ‘pig’. UM ئاقاي qaqai D15:5; SM 中合中孩 *kak<sup>h</sup>ai* N166/5:40; AM غاقاي *qaqai* M175a; Ph ئاقاي *qaqai* Z25:36.

\**kal* ‘fire’. UM ئال qal T61:7; SM 中合勒 *kal* N193/7:24; AM غال *zal* M174b.

\**kar* ‘hand’. UM ئار qar D19:13a11; SM 中合兒 *kar* N59/1:40; AM غار *bar* M175b.

\**kasi(h)un* ‘bitter’. SM 中合失溫 *kašiun* N77/2:9; AM غاشون *kašun* M178b.

\**kem* ‘fault’. UM كام kam D10:7a4; Ph ئەم ئەم gem-ijen [RFL] Z51(4)b:6.

\**ker* ‘house’. UM كار kar D15:4; SM 格兒 *ker* N16/1:10; AM كير *kir* M170b. Ph ئەم ger Z10:14.

\**kerel* ‘light’. UM كارال karal D11:157b9; SM 格舌連勒 *kerel* N98/2:42; Ph ئەم هەم ئەرل gerel-un [GEN] P13:8.

\**kørehesyn/n* ‘beast’. UM كۈرەسۈن kyruka-d [PL] D19:8b12; SM 戈舌劣額孫 *korøesun* N26/1:16; AM كوراسون *kurasun* M172a; Ph ئەرەپەن gørø'e Z26:33.

\**kurpal/n* ‘three’. UM كۈرپەن qurban D1:4; SM 中忽兒班 *χurpan* N4/1:3, 中忽舌兒 巴納 *χurpan-a* [DAT] N251/11:12; AM غربان *erban* M179b; Ph ئەپەن qurban P2:20.

\**k<sup>h</sup>a(h)a* ‘to shut’. SM 中合阿 *χaa* N245/10:34; AM قا qa M297b.

\**k<sup>h</sup>ahalka* ‘gate’. UM كەھالقا qaqalq-a D15:9; SM 中合阿勒<sup>中合</sup> *χaalya* N247/11:2; AM قەلۇقا IM444b.

\**k<sup>h</sup>aičhi* ‘scissors’. UM كەھىچى qajiči D22:35b2; SM 孩亦赤 *xajic<sup>h</sup>i* HY1:11a; AM قايچى *qaiji* M346a.

\**k<sup>h</sup>akac<sup>h</sup>a* ‘to leave’. UM كەھاچى qačača-n [cv] D11:156a13; SM 中合中合察 *yayač<sup>h</sup>a* N177/6:22; AM قاغاچا *gaxača* M286a.

- \**k<sup>h</sup>alahun* ‘warm’. UM گالاون *qalaqun* D12:16; SM 合刺溫 *χalaun* N201/8:17; AM قلاون *qlawun* M288b; Ph 且 阿 詈 *qala'un* P2:19.
- \**k<sup>h</sup>amthu* ‘together’. UM گامتو *qamtu* D9:35; SM 合禿 *χamthu* N64/1:44; AM قامتو *qamtu* M290b; Ph 且 那 *qamthu* Z18:35.
- \**k<sup>h</sup>ara* ‘black’. UM گارا *qar-a* D17:14; SM 合舌刺 *χara* N21/1:13; AM قرا *qra* M292a.
- \**k<sup>h</sup>ari* ‘to return’. UM گاریقان *qari-qsan* [PSTP] D10:34b3; SM 合舌里 *χari* N94/2:37; AM قارېي *qari-ba* [PST] M280b.
- \**k<sup>h</sup>aučin* ‘old’. UM گاچين *qaučin* T70:10; SM 合兀陳 *χaučin* N78/2:12; AM قچين *qujin* M313b.
- \**k<sup>h</sup>auli* ‘law’. UM گاولي *qauli* D21:9; SM 合兀里 *χauli* N229/9:46; Ph 且 阿 詈 *qa'uli* P2:20. [The modern languages indicate \**k<sup>h</sup>u*]
- \**k<sup>h</sup>ečije* ‘when’. UM گاچى *kačij-a* D10:35a5; SM 客只額 *k<sup>h</sup>ečie* N100/2:45; AM كىچى *kijija* M213b.
- \**k<sup>h</sup>ei* ‘wind’. UM گاي *kai* D11:167a6; SM 克 *k<sup>h</sup>ej* N31/1:19; AM كىچى *kiji* N213b; Ph 且 *k<sup>h</sup>ei* P13:12.
- \**k<sup>h</sup>elel*n ‘tongue’. UM گالا *kala* D11:165a11; SM 客連 *k<sup>h</sup>elen* N104/3:2; AM كىلەن *kilän* N214b.
- \**k<sup>h</sup>en* ‘who’. UM گان *kan* D17:19; SM 庚 *k<sup>h</sup>en* N68/1:48; AM كىن *kin* M216a; Ph 且 *k<sup>h</sup>en* Z36:42.
- \**k<sup>h</sup>etyn* ‘how many’. UM گادун *kadun* D4:1; SM 客敦 *k<sup>h</sup>etun* N204/8:33; AM كىدۇن *kidun* M203b.
- \**k<sup>h</sup>i* ‘to do’. UM گىكى *ki-kun* [FUTP] D14:7; SM 乞坤 *k<sup>h</sup>i-k<sup>h</sup>un* [FUTP] N152/5:13; AM كىكى *ki-ku* [FUTP] M219a; Ph 且 且 *k<sup>h</sup>i-k<sup>h</sup>un* [FUTP] Z18:31.
- \**k<sup>h</sup>ičahar* ‘border’. UM گىچاقار *qičaqar* D17:31; SM 乞札阿舌兒 *k<sup>h</sup>ičaar* N257/11:40; AM قىچار *qajar* M135a; Ph 且 且 *k<sup>h</sup>ičhaar-a* [DAT] P13:4.
- \**k<sup>h</sup>iči(h)e* ‘to strive’. UM گىچى *kičika-n* [cv] D10:7b5; SM 乞赤額 *k<sup>h</sup>ičhie* N218/9:21; AM كىچا *kija* M219a.
- \**k<sup>h</sup>ilpar* ‘easy’. UM گىلىپار *qilbar* D11:156b12; SM 勤勤巴兒 *k<sup>h</sup>ilpar* N35/1:21, 乞勤八舌刺 *k<sup>h</sup>ilpar-a* [DAT] N22/1:14; AM قىلىپار *qilbar* M298a.
- \**k<sup>h</sup>imusun* ‘nail’. SM 乞木速 *k<sup>h</sup>imusu* N199/8:7; AM قيموسون *qimusun* M298b.
- \**k<sup>h</sup>it<sup>h</sup>at* ‘Chinese’. UM گيدات *qidat* D22:3a2; SM 乞塔噶 *k<sup>h</sup>it<sup>h</sup>at<sup>h</sup>* N132/4:10.
- \**k<sup>h</sup>ohasun* ‘empty’. UM گوچاسون *ququsun* D11:158a14; SM 中豁斡孫 *χoosun* N105/3:6; AM قوشون *qusun* M306b.
- \**k<sup>h</sup>oina* ‘back’. UM گوچينا *qujina* D6:23; SM 中豁亦納 *χoina* N11/1:7; AM قويئنه *quinä* M299b; Ph 且 且 且 *qojina* P12:1.
- \**k<sup>h</sup>ojar* ‘two’. UM گوچار *qujar* D9:34; SM 中豁牙兒 *χojar* N3/1:2; AM قوييل *qujar* M303b; Ph 且 且 *qojar* Z12:11.
- \**k<sup>h</sup>ola* ‘far’. UM گول *qula* D9:9; SM 中豁羅 *χolo* N227/9:42; AM قوله *qula* M300a.
- \**k<sup>h</sup>oni/n* ‘sheep’. UM گونин *quni-t* [PL] D13:3; SM 中豁紉 *χonin* N19/1:11; AM قونىن *qunin* M302a; Ph 且 且 且 *qonin* Z32:25.
- \**k<sup>h</sup>øisy/n* ‘navel’. UM گويىسون *kyisun* T30:7; SM 闊亦孫 *k<sup>h</sup>oisun* HY1:24a; AM كويىسون *kuisun* M226a.
- \**k<sup>h</sup>øit<sup>h</sup>en* ‘cold’. UM گويىدان *kyidan* T80:3; SM 闊亦田 *k<sup>h</sup>oit<sup>h</sup>en* N207/8:40; AM كويىتان *kuitan* N226a.

- \**kʰokʰe* ‘blue’. UM ڪوڪ kyka D11:164a6; SM 閩闊 *kʰokʰo* N203/8:31; AM ڪوڪ kuka M220b.
- \**kʰol* ‘foot’. UM ڪول kyl—*ijan* [RFL] D10:37a6; SM 閩勒 *kʰol* N203/8:29; 閩里顏 *kʰol-ijan* [RFL] N173/6:13; AM ڪول *kul* M221b, ڪولان *kul-an* [RFL] M222.
- \**kʰolesy/n* ‘sweat’. SM 閩列孫 *kʰolesun* N254/11:25; AM ڪولا سونى *kulasun-i* [ACC] M333b.
- \**kʰoyken* ‘light’. UM ڪونڪان kynkka—*lan* [DER] D10:14a7; SM 匡格捏 *kʰoyken-e* [DAT] HY2:16a; AM ڪونڪان *kunkan* M223a.
- \**kʰučʰa* ‘to bark’. SM ٿ忽察 *χučʰa* N189/7:10; AM ڦوچا *quja* M307a.
- \**kʰ/u/o/ji* ‘sheath’. AM ڦوچي *qui* M309a. [The AM form with uvular *q* shows that the vowel may be \**u* or \**o*. Reflexes in modern languages (e.g. Halh *xui* ხუ) indicate \**u*.]
- \**kʰulakai* ‘thief’. UM ٿولاكاي qulqai D7:26; SM ٿ忽刺中孩 *χulaxaj* N131/4:8; AM ڦولاغاي *qulakai* M309a; Ph ڦل ڦل ڦل *qulaqai* Z5:35.
- \**kʰupi* ‘destiny’. UM ٿوبi qubi T24:2; SM ٿ忽必 *χupi* N23/1:15; AM ڦوبى *qubi* M306b.
- \**kʰura* ‘rain’. UM ٿورا *qur-a* D11:158a1; SM ٿ忽舌刺 *χura* N108/3:12; AM ڦوره *qura* M101b; Ph ڦل ڦل *qura* P13:12.
- \**kʰuru(h)u/n* ‘finger’. SM ٿ忽舌魯兀 *χuruu* N178/6:43; AM ڦورون *qurun* M312b. ڪد و *kndu* M227b.
- \**k(h)yr* ‘to reach’. UM ٿير ٿير basu [COND] D3:5; SM 吉兒 *kur* N32/1:20; AM ڪور *kur* M229a; Ph ڀر ڪyr P13:4, ڀر ڪur Z10:7. [SM indicates \**k*. Ph indicates \**kʰ*, as do all modern languages. There are a few words which begin with the character 古 *ku* in Sino-Mongolian but with *kʰ* in ’Phags-pa, indicating Old Mongolian \**k* and \**kʰ*, respectively; the other sources do not differentiate these consonants. Hattori (1976) says that although there are Chinese characters which are pronounced *kʰu* (e.g. 窟 ‘cave’), they are avoided because they have unsuitable meanings, and are replaced by 古 *ku* (meaning ‘ancient’), which thus denotes either *ku* or *kʰu*.]
- \**k(h)yreken* ‘son-in-law’. UM ٿير ٿير kyrakan D12:19; AM ڪور اکلن *kurakan* M229a. [The modern languages indicate \**kʰ*]
- \**manklai* ‘forehead’. UM ڦانگان manklai D12:9; SM 莽來 *maylaj* N4/1:3; AM منقلای *mnqlai* M222a.
- \**masi* ‘very’. UM ڦانگان masi D10:10b7; SM 馬石 *maši* N69/2:1; Ph ڦانگان *maši* P13:2.
- \**mete* ‘to know’. UM ڦانگان mada-ku [FUTP] D11:161a7; SM 篓迭坤 *mete-kʰun* [FUTP] N143/4:35; AM ميدا-کو *mida-ku* [FUTP] M235a; Ph ڦانگان mede-kʰun [FUTP] Z21:14.
- \**mikʰa/n* ‘meat’. UM ڦانگان miqa-bar [INST] D10:23a3; SM 米中罕 *mixan* N232/10:4; AM ميقان *miqan* M236b.
- \**mijkʰa/n* ‘thousand’. UM ڦانگان minkqan D13:30; SM 敏中罕 *minxan* N208/8:43; AM mnqan M236b; Ph ڦانگان minqan P12:4. [The AM form shows that OM has \**kʰ*, but the modern languages indicate \**k*]

- \**mokai* ‘snake’. UM ムカイ muqai D9:41; SM 抹<sub>中</sub>孩 *moqaj* N102/2:48; AM موغاي muzai M238a; Ph 모<sub>乞</sub> 모<sub>乞</sub> moqoi Z11:33.
- \**moykal* ‘Mongol’. UM モンゴル munkkul D1:2; SM 忙<sub>中</sub>豁<sub>勒</sub> *moykol* N108/3:12; AM منغول *munkul* M238a; Ph 모<sub>乞</sub> 모<sub>乞</sub> moyqol Z36:8.
- \**mori/n* ‘horse’. UM モリ murin D13:32; SM 秋<sub>吉</sub>驥 *morin* N55/1:36; 秋<sub>吉</sub>驥納察 morin-ačha [ABL] N265/12:1; AM مورين *murin* M238b; Ph 모<sub>乞</sub> 모<sub>乞</sub> morin Z12:13, 모<sub>乞</sub> 모<sub>乞</sub> 모린-ижан [RFL] Z51(3)b:3.
- \**morit* ‘horses’. UM モリット murit D13:3; SM 抹<sub>敦</sub> *molith* N205/8:35; AM موريت murid M238b; Ph 모<sub>乞</sub> 모<sub>乞</sub> morid Z22:18.
- \**motu/n* ‘tree’. UM モドゥ mudun D17:50; SM 抹敦 *motun* N174/6:17; AM مودون mudun M237b; Ph 모<sub>乞</sub> 모<sub>乞</sub> 모<sub>乞</sub> modun-u [GEN] P13:11.
- \**mølsy/n* ‘ice’. UM モルジ mylsun D10:6a2; SM 沫<sub>勤</sub>孫 *molsun* N238/10:12; AM مولسون *mulsun* M239a.
- \**mør* ‘path’. UM モル myr D6:20; SM 抹兒 *mor* N90/2:28; AM مور mur M239b; Ph 모<sub>乞</sub> 모<sub>乞</sub> mør Z4:18, 모<sub>乞</sub> 모<sub>乞</sub> 모<sub>乞</sub> mør-ijer [INST] Z18:17.
- \**nahat* ‘to play’. UM ナハツ naqad-un [cv] D11:167a3; SM 納阿敦 *naat-un* [cv] HY1:17b; AM ناتب nat-ba [PST] M132a.
- \**naiman*/n ‘eight’. UM ナイマン naiman D9:41; SM 乃蠻 *najman* N90/2:30; AM نایمان naiman M244b; Ph 모<sub>乞</sub> 모<sub>乞</sub> 모<sub>乞</sub> naiman-a [DAT] P2:25.
- \**napčhi/n* ‘leaf’. UM ナーピン nabčin D15:34; SM 納卜陳 *napčhin* HY1:4a; AM ناجین nabjin M244a; Ph 모<sub>乞</sub> 모<sub>乞</sub> 모<sub>乞</sub> nabčin P13:11.
- \**narin* ‘fine’. UM ナーリン narin D20:14; SM 納<sub>吉</sub>鄰 *narin* N243/10:25; AM نارین narin M246a.
- \**nasu/n* ‘age’. ナシ nasu D10:11a4; SM 納孫 *nasun* N66/1:46; AM ناسون nasun M246b; Ph 모<sub>乞</sub> 모<sub>乞</sub> 모<sub>乞</sub> nasun P13:12.
- \**nehe* ‘to open’. UM ニカ naka D21:40; SM 振額 *nee* N246/10:43; AM نیب ni-ba [PST] M248b.
- \**nek<sup>h</sup>e* ‘to weave’. UM ナカマル naka-mal [DER] D22:37b5; SM 振客 *nek<sup>h</sup>e* N90/2:28; AM نیکابه nika-ba [PST] M248a.
- \**nekhei* ‘sheepskin’. SM 鞭克 *nek<sup>h</sup>ej* N112/3:20; AM نیکای nikai M248a.
- \**nere* ‘name’. UM ナル nar-a D10:2b3; SM 振<sub>吉</sub>列 *nere* N7/1:4; AM نیرا nira M248a; Ph 모<sub>乞</sub> 모<sub>乞</sub> nere P13:12.
- \**nič<sup>h</sup>ykyn* ‘naked’. SM 你出裯 *nič<sup>h</sup>ykun* N86/2:24; AM نیجوكون njukun M221b.
- \**nihu* ‘to hide’. UM ニヒュ niqū-ča [DER] T25:18; SM 你兀 *niu* N86/2:24; AM نیو niu M257b.
- \**nilk<sup>h</sup>a* ‘baby’. UM ニルク nilq-a D10:18a3; SM 你<sub>勒</sub><sub>中</sub>合 *nilxa* N195/7:39; AM نیله nilqa M253b.
- \**nimken* ‘thin’. UM ニムカン nimkan D10:6a1; SM 慾堅 *ninken* HY1:27a; AM نیمکان nimkan M257a.
- \**niruhu/n* ‘spine’. UM ニルクン niruqun D13:32; SM 你<sub>吉</sub>魯溫 *niruun* N147/4:49; AM نیرون nirun M257a.
- \**nis* ‘to fly’. UM ニス ču [IPFG] T36:14; SM 你思 *nis* N63/1:43; AM نیسبه nis-ba [PST] M257b, نیسقابه nis-qa-ba [CAUS-PST] M257b.

- \**nisi* ‘to beat’. SM 你失禿<sup>中</sup>孩 *niši-t<sup>h</sup>uχaj* [IMP] N199/8:9; 你失<sup>黑</sup>苔<sup>中</sup>渾 *niši-xta-χun* [PASSIVE-FUTP] N227/9:43.
- \**nity/n* ‘eye’. UM 𩨱<sup>ニ</sup> *nidun* D15:8; SM 你敦 *nitun* N62/1:43; 你覩邊 *nitu-pen* [RFL] N254/11:25; AM نیدون *nidun* M249b. [The SM reflexive shows that the word is front-vocalic]
- \**noir* ‘sleep’. UM 𩨱<sup>ニ</sup> *nujir* T34r14; SM 那亦舌兒 *noir* N205/8:37; AM نوچیر *nujir* M382b.
- \**nokahan* ‘green’. UM 𩨱<sup>ニ</sup> *nuquqan* D20:13; SM 那<sup>中</sup>豁安 *noχoan* N170/6:2; AM نوغان *nuqan* M259a.
- \**nokhai* ‘dog’. UM 𩨱<sup>ニ</sup> *nuqai* D15:10; SM 那<sup>中</sup>孩 *noχaj* N78/2:11; AM نوچای *nuqai* M259a; Ph ئۆقاي *noqoi* Z51(3)a:10.
- \**nokher* ‘friend’. UM 𩨱<sup>ニ</sup> *nykur* D14:18; SM 那可兒 *nok<sup>h</sup>ar* N13/1:8; AM نوکر *nukr* M261a; Ph ئۆكەر *nök<sup>h</sup>ər* Z51(3)b:2.
- \**oira* ‘near’. UM 𩨱<sup>ニ</sup> 𠂇 *ujir-a* D9:9; SM 翰亦舌刺 *oira* N31/1:19; AM اويره *uirə* M263a.
- \**ol* ‘to find’. UM 𩨱<sup>ニ</sup> 𢠖 *ul-basu* [COND] D10:20a5; SM 翰勤 *ol* N114/3:24; AM اوبله *ul-ba* [PST] M265b; Ph ئۆل *ol-uqsad* [PSTP] Z34:29.
- \**olan* ‘many’. UM 𩨱<sup>ニ</sup> *ulan* D7:27; SM 翰樂 *olon* N56/1:37; AM اولان *'ulan* M264a; Ph K ئۆل *olan* Z5:29.
- \**ora* ‘to enter’. UM 𩨱<sup>ニ</sup> *ura-qsan* [PSTP] D7:31; SM 翰舌羅 *oro* N5/1:3; AM اورا *'ura* M269a; Ph K هور *oro* Z34:30.
- \**ø[h/p]er* ‘self’. UM 𩨱<sup>ニ</sup> *ybar* D7:2; SM 翰額兒 *oer* N86/2:24; AM اوور *'ur* M279b; Ph ئۆپەر *ø'er* Z18:32. [UM indicates \*p and the other sources \*h; the modern languages, e.g. Halh *oor* oop, indicate \*h]
- \**øk* ‘to give’. UM 𩨱<sup>ニ</sup> *yk-ču* [IPFG] D6:28; SM 翰克 *ok<sup>h</sup>* N13/1:8; AM اوکەن *'uk-ba* [PST] M274a; Ph ئۆگەن *øg* Z2:14.
- \**øk<sup>h</sup>in* ‘girl’. UM 𩨱<sup>ニ</sup> *ykin* D12:19; SM 翰勤 *ok<sup>h</sup>in* N6/1:4; AM اوکین *'ukin* M275a.
- \**øntekel/n* ‘egg’. SM 完迭堅 *onteken* N276/12:31.
- \**øyke* ‘colour’. UM 𩨱<sup>ニ</sup> *ynkka* D11:160a4; SM 汪格 *oyke* N64/1:45; AM اوونکەن *'unka* M306b; Ph ئۆنگەن *øyge* P12:1.
- \**pahu* ‘to go down’. UM 𩨱<sup>ニ</sup> *baqu-ču* D19:10a12; SM 保兀 *pawu* N63/1:43; AM باو *bau* M114a; Ph باۋ *ba'u* P1:17.
- \**pajan* ‘rich’. UM 𩨱<sup>ニ</sup> *bajan* D10:5a6; SM 伯顏 *pajjan* N3/1:2; AM بابان *bajan* M114a.
- \**parahun* ‘right’. UM 𩨱<sup>ニ</sup> *baraqun* D17:6; SM 把舌刺溫 *paraun* N104/3:2; AM بارۇن *brawun* M112a.
- \**pari* ‘to hold’. UM 𩨱<sup>ニ</sup> *bari-lan* [DER] D12:16; SM 把舌里 *pari* N19/1:12; AM بارى *bari* M112a; Ph بارى *bari* P1:16.
- \**pars* ‘tiger’. UM 𩨱<sup>ニ</sup> *bars* D6:14; SM 巴兒思 *pars* N78/2:12; AM بارس *bars* IM402b; Ph بارس *bars* P2:24.
- \**pasa* ‘also’. UM 𩨱<sup>ニ</sup> *basa* D6:24; SM 巴撒 *pasa* N19/1:12; AM بىسا *bsa* M113a; Ph بىسا *basa* P2:19.
- \**pathu* ‘firm’. UM 𩨱<sup>ニ</sup> *badu-da* [DER] D19:9a7; SM 巴禿 *pat<sup>h</sup>u* N256/11:36; AM باتۇ *batu* M113b.

- \**peje* ‘body’. UM バジ baj-a D12:15; SM 別耶 *peje* N33/1:20; AM بیج *bia* M198a; Ph بېج *beje* P12:1.
- \**peri* ‘daughter-in-law, bride’. UM バリ bari T51:10; SM 別舌里 *peri* N272/12:24; AM بېرى *biri* M118a.
- \**pičhi* ‘to write’. UM ピチク biči-kui [FUTP] D11:159b2; SM 必赤 *pičhi* N203/8:31; AM بېچى *bijī* M118b; Ph بېچى *bičhi* P2:26.
- \**pičhik* ‘letter’. UM ピチク bičik D2:3; SM 必赤克 *pičhik* N203/8:31; AM بېچىك *bijik* M118b; Ph بېچىك *bičhig* P1:20.
- \**pisilak* ‘cheese’. SM 必石刺 *pisilax* HY1:13a; AM بېشلاقين *bišlaq-in* [GEN] M119b.
- \**pos* ‘to rise’. UM ポス bus-qui [FUTP] D10:9b1, ポスチ bus-qa-ču [CAUS-IPFG] D10:37b2; SM 李思 *pos* N98/2:42; AM بوسه *bus-baq* [PST] M122a; Ph بوس Z36:24, بېس قىز *bōs-qā-ju* [CAUS-IPFG] P13:4.
- \**pø(h)ere* ‘kidney’. SM 李額舌列 *poere* N100/2:44; AM بۇرۇ *būra* L1266.
- \**pø(h)esy/n* ‘louse’. SM 李額孫 *poesun* N201/8:18; AM بواسون *buasun* M123a.
- \**pulak* ‘spring’. UM ブラク bulaq D17:50; SM 不刺合 *pulax-a* [DAT] N128/4:2; AM بولاق *bulaq* M289a; Ph بولاق *bulaq-a* [DAT] Z8:28.
- \**pyri/n* ‘each’. UM ピリ byrin D9:3; SM 不舌里 *puri* N31/1:19; AM بۇرى *buri* M105a; Ph بۇرى *buri* Z36:32, بېرىن *byrin-e* [DAT] P13:9.
- \**pyse* ‘belt’. UM ピヤ byz-a D13:25; SM 不薛 *puse* N117/3:27; AM بوسه *busa* M128b.
- \**sa(h)a* ‘to milk’. SM 撒阿 *saa* N152/5:17; AM سا *sa* M319b.
- \**sahu* ‘to sit’. UM ハル saqu-qsan [PSTP] D9:13; SM 撒兀 *sau* N24/1:15; AM ساو *sau* M319a; Ph زەۋىسا *sa'u* Z5:19.
- \**sahuri/n* ‘base’. UM ハルサク saqurin D11:160a3; SM 撒兀舌鄰 *saurin* N64/1:44.
- \**sain* ‘good’. UM سابن sain D7:8; SM 撒因 *sain* N6/1:4; AM ساين *sain* M315a; Ph زەۋىس *sajin* Z51(4)a:1.
- \**sakhal* ‘beard’. UM سابقا saqal T70:5; SM 撒兀合勒 *saxal* N203/8:28; AM سقال *sqlal* M318a.
- \**sakhi* ‘to guard’. UM سابقا saqi-n [cv] D10:4b7; SM 撒乞 *sakhi* N79/2:14; AM ساقىھە *saqi-baq* [PST] M318a; Ph زەۋىسا *saqi* Z10:4.
- \**sam* ‘comb’. SM 薛 *sam* HY1:10b; AM سەم *sm* M317b.
- \**sara* ‘moon’. UM ساب拉 sara D5:14; SM 撒舌刺 *sara* N21/1:13; AM سارا *sara* M318b; Ph مەزارا *zara* P2:24.
- \**se(h)yil* ‘tail’. SM 薛溫勒 *seul* N24/1:15, 薛兀列徹 *seul-ečhe* [ABL] N77/2:10; AM سۈول *suul* M330b.
- \**setkil* ‘mind’. UM سەتكىل sadkil D9:22; SM 薛渴乞勒 *sethkhil* N125/3:48; AM سەتكىل *sitkil* M321b; Ph سەتكىل *sedkhil* Z36:21.
- \**si(h)e* ‘to piss’. SM 失額 *sie* N194/7:28; AM شېكىر *ši-ku* [FUTP] M331b.
- \**sini* ‘new’. UM سابىن sini D22:7:5; SM 失你 *sini* N265/12:1; AM شىنى *šini* M334b; Ph سىنە *sine* Z5:43.
- \**sinqhor* ‘falcon’. UM سابقۇر sinkqur D22:16a4; SM 升中豁兒 *šijxor* N63/1:43; AM شۇقۇر *šüqür* L76; Ph سىنەقۇر *xiňqor* Z59.
- \**sipahu/n* ‘bird’. UM سابقۇن sibaqun D17:29; SM 失鵠溫 *šipawun* N111/3:18; AM شىپاۋۇن *šibawun* M332b; Ph سىپاۋۇن *šiba'un* Z51(1)a:5.

- \**sipar* ‘mud’. SM 失巴兒 šipar N102/2:48; AM شیبار šibar M187a.
- \**sira* ‘yellow’. UM ᠲୁସା sira T29:5; SM 失舌刺 šira N21/1:13; AM شیره šira M335b.
- \**siri(h)e* ‘table’. SM 石舌里額 širie HY1:11a; AM شیره širə M166a.
- \**sity/n* ‘tooth’. SM 失都 šitu N82/2:19; AM شیدون šidun M332b.
- \**su(h)u* ‘armpit’. SM 速兀 suu N214/9:13; AM صو su M328b.
- \**sumu/n* ‘arrow’. UM ᠲୁସନ୍ sumun D11:162b3; SM 速門 sumun N147/4:49; AM سومون sumun M327b.
- \**sur* ‘to learn’. UM ᠲୁସନୋ sur-basu [COND] D13:17; SM 速舌兒 sur N149/5:4; AM سور sur M328a; Ph ئۇر sur P11:6.
- \**syk<sup>h</sup>e* ‘axe’. SM 速客 suk<sup>h</sup>e N214/9:14; AM سوکا suka M189b.
- \**syme* ‘temple’. UM ᠲୁସା ୟୁସା sym-a D15:4; SM 速篾思 sume-s [PL] N267/12:9; AM سومە suma M329a; Ph ئۇସە ئۇمە syme P12:6.
- \**ta(h)ari* ‘sore’. SM 菖阿舌里 taari N24/1:15; AM دارى dari M139b.
- \**tahun* ‘sound’. UM ᠲୁସନ୍ taqun D10:12b4; SM 菖溫 taun N244/10:29; AM داون dawun M139a.
- \**taru* ‘to press’. UM ᠲୁସା taru-n [cv] D12:16; SM 菖魯 taru N246/10:43; AM دارو daru M339b; Ph ئۇر daru Z36:36.
- \**tehel* ‘gown’. UM ᠲୁସା takal D11:160a9; SM 迭額 teel N33/1:20; AM دېل dil M141b.
- \**tehere* ‘above’. UM ᠲୁସା ୧୦କାରା takar-a D9:30; SM 迭額舌列 teere N1/1:1; AM دير dira M142a; Ph ئۇସە ڌئے deere P12:3.
- \**tehesyn* ‘rope’. UM ᠲୁସନ୍ takasun D19:9a4; SM 迭額孫 teesun HY1:10a; AM ديسون disun M126a.
- \**tehy* ‘younger brother’. UM ᠲୁସା taku D9:27; SM 迭兀 teu N18/1:11; AM دو du M256a; Ph ئۇر de'u Z10:11.
- \**tok<sup>h</sup>alaj* ‘lame’. SM 朵合郎 toxalaŋ HY1:24b; AM دوقلان duqlan M143a. [AM indicates \**k<sup>h</sup>*. Most modern languages indicate \**k*.]
- \**tolaha/n* ‘seven’. UM ᠲୁସନ୍ tulukan D8:12; SM 朵羅安 toloan N45/1:27; AM دولان dulan M142b; Ph ئۇر ئۆلە dolo'an Z14:28.
- \**tot<sup>h</sup>ara* ‘inside’. UM ᠲୁସନ୍ ୨ୁଡ଼ାରା tudur-a D13:5; SM 朵脫舌刺 tot<sup>h</sup>ora N6/1:4; AM دوتار dot<sup>h</sup>ora M143b; Ph ئۇر ئۆଡ଼ା dolar Z36:39.
- \**tøč<sup>h</sup>i/n* ‘forty’. UM ᠲୁସନ୍ tyčin D9:25; SM 朵臣 toč<sup>h</sup>in N177/6:23; AM دوجین dužin M143b.
- \**tørpel/n* ‘four’. UM ᠲୁସନ୍ tyrban D8:13; SM 朵兒邊 torpen N11/1:7; AM دوربان durban M143b; Ph ئۇر ئورپە dørbe P13:7, ئۇر ئورپە dørben-e [DAT] Z29:30.
- \**tumta* ‘middle’. UM ᠲୁସନ୍ tumda-tu [DER] D11:159b9; SM 敦苔 tunta N4/1:3; AM دوندہ dunda M144b; Ph ئۇر ئۇمدا dumda Z5:42.
- \**tyhyreŋ* ‘full’. UM ᠲୁସନ୍ tykurank D10:5a1; SM 都兀舌良 tuureŋ N145/4:39; AM دوران duran M148b; Ph ئۇر ئۇر dy'ur-P12:7.
- \**t<sup>h</sup>ak<sup>h</sup>i* ‘to offer’. UM ᠲୁସନ୍ taqi-qui [FUTP] D10:17a2; SM 塔乞牙 t<sup>h</sup>ak<sup>h</sup>i ja N216/9:20; AM تاقىيە taqi-ba [PST] M124b.
- \**t<sup>h</sup>ak<sup>h</sup>i ja* ‘hen’. UM ᠲୁସନ୍ taqij-a T68:18; SM 塔乞牙 t<sup>h</sup>ak<sup>h</sup>i ja N141/4:30; AM تاقىيە taqia M148b; Ph ئۇر ئۇر ئاقىيە taqia M341a; Ph ئۇر ئۇر ئاقىيە t<sup>h</sup>ak<sup>h</sup>i ja P4:18.

- \**t<sup>h</sup>ani* ‘to recognize’. SM 塔泥 *t<sup>h</sup>ani* N32/1:20; AM تانیبے *tani-baq* [PST] M340b. تانین *tabin* M338a.

\**t<sup>h</sup>apiLN* ‘fifty’. UM ئەپىل *tabin* D19:7b11; SM 塔賓 *t<sup>h</sup>apin* N136/4:18; AM تابىن *tabin* M338a. Ph ئەپىل *t<sup>h</sup>abun* Z5:42, ئەپىل *t<sup>h</sup>abun-a* [DAT] Z2:19.

\**t<sup>h</sup>at<sup>h</sup>a* ‘to pull’. UM ئادۇقۇلۇن *tada-quł-un* [CAUS-CV] D13:32; SM 塔塔 *t<sup>h</sup>at<sup>h</sup>a* N76/2:7; AM ئاتا *tata* M342a; Ph ئەپىل *t<sup>h</sup>at<sup>h</sup>a* P2:21.

\**t<sup>h</sup>aulai* ‘hare’. UM ئاولاي *taulai* D5:13; SM 討來 *t<sup>h</sup>awlaj* N272/12:20; AM تاولای *taulai* M343a; Ph ئەۋلائى *t<sup>h</sup>awlai* Z34:32.

\**t<sup>h</sup>emehe/n* ‘camel’. UM ئاماكان *tamakan* D22:37b2; SM 帖篾延 *t<sup>h</sup>emeen* N244/10:28; AM تىمان *timan* M345b.

\**t<sup>h</sup>emyr* ‘iron’. UM ئامۇر *tamur* D9:23; SM 帖木<sub>舌兒</sub> *t<sup>h</sup>emur* N199/8:10; AM تىمور *timur* M346a.

\**t<sup>h</sup>oha/n* ‘number’. UM ئۇقان *tuqan* D13:24; SM 脫安 *t<sup>h</sup>oan* N23/1:15; AM توندو *tun-du* [DAT] M352a; Ph ئەپىل *t<sup>h</sup>o-on* P12:3.

\**t<sup>h</sup>oka(h)an* ‘kettle’. SM 脫<sub>中</sub>豁阿泥 *t<sup>h</sup>oxoan-i* [ACC] N277/12:35; AM توغان *turban* M109a.

\**t<sup>h</sup>osuLN* ‘fat’. UM ئۇسۇن *tusun* D11:167a8; SM 脫孫 *t<sup>h</sup>osun* N254/11:24; AM توسوون *tusun* M351b; Ph ئەپىل *t<sup>h</sup>osun* Z11:20.

\**uhu* ‘to drink’. UM ئۇقۇمىش *uqu-basu* [COND] D19:11b9; SM 兀兀 *uu* N179/6:34; AM او<sub>u</sub> M371b.

\**uila* ‘to cry’. UM ئۇچىلا *ujila-qui* [FUTP] D10:35b4; SM 委亦刺 *ujila* N56/1:37; AM اوپىلا *uila* M362a.

\**uk(<sup>h</sup>)ija* ‘to wash’. UM ئۇچىجا *uqija-basu* [COND] T50r3; SM 兀乞牙 *uk<sup>h</sup>ija* N189/7:12; AM اوغا<sub>u</sub> *uza* M362a. [SM indicates \**k<sup>h</sup>*, and AM \**k*. The modern languages indicate \**k*.]

\**ulus* ‘state’. UM ئۇلۇس *ulus* D1:2; SM 兀魯思 *ulus* N64/1:44, 兀魯昔 *ulus-i* [ACC] N73/2:4; AM اولوسى<sub>u</sub> *ulus-i* [ACC] M204a; Ph ئەپىل *ulus* P12:1.

\**umarth<sup>h</sup>a* ‘to forget’. UM ئۇماردا *umarda-ču* [IPFG] D7:25; SM 兀馬<sub>舌兒</sub>塔 *umart<sup>h</sup>a* N152/5:15; AM ئۇمۇردا *mrtä* M234a. [The modern languages lack reflexes of initial \**u*]

\**unt<sup>h</sup>a* ‘to sleep’. UM ئۇندا *unda-qui* [FUTP] D10:9b1; SM 穩榻 *unt<sup>h</sup>a* HY1:17b; AM اوئى<sub>u</sub> *unta* M365a.

\**unu* ‘to ride’. UM ئۇنۇ *unu-qu* [FUTP] D13:32; SM 兀訥 *unu* N89/2:43; AM اوئۇ<sub>u</sub> *unu* M365a.

\**uri* ‘to invite’. UM ئۇرىنىڭ *uri-qui* [FUTP] D11:158b12; SM 兀<sub>舌</sub>里 *uri* N203/8:32; AM اوئىپىلا *uri-baq* [PST] M366a.

\**urita* ‘before’. UM ئۇریدا *urida* D8:2; SM 兀<sub>舌</sub>里答 *urita* N246/10:44; AM اوئىپىلا *urida* M366a; Ph ئەپىل *urida* P12:1.

\**urt<sup>h</sup>u* ‘long’. UM ئۇرتۇ *urtu* D13:35; SM 兀兒圖 *urt<sup>h</sup>u* N106/3:8; AM اوئۇتۇ *urtu* M366b; Ph ئەپىل *urt<sup>h</sup>u* Z36:24.

\**urus* ‘to flow’. UM ئۇرسۇ *urus-qu* [FUTP] D12:47; SM 兀<sub>舌</sub>魯思 *urus* N81/2:17; AM اوئىرسۇ *urus* M368a; Ph ئەپىل *urus* Z51(4)a:5.

- \**usu/n* ‘water’. UM ᠤᠰᠤᠨ usun D13:4; SM 兀孫 *usun* N81/2:17; AM اوصون 'uṣun M368b; Ph ᠤᠵᠤᠰ usun P2:18.
- \**yče* ‘to see’. UM ᠢᠴᠡ yča-ku [FUTP] D11:163b5; SM 兀者 *uče* N5/1:3; AM اجاڭو 'uňa-ku [FUTP] M218b; Ph ئەڭ يې Z36:40.
- \**yčyhyr* ‘point’. UM ᠢᠴᠤᠱᠳᠳ yčukur D17:46; SM 兀主兀舌列 *učyur-e* [DAT] N166/5:41; AM اوجۇور 'užuwur M100a; Ph ئەڭ يەڭ يېڭىھ يېڭىھ yě'ur P12:1.
- \**yile* ‘deed’. UM ᠢᠶᠯᠴ yila D8:9; SM 委亦列 *ujile* N197/7:49, 委亦列昔 *ujile-s-i* [PL-ACC] N279/12:49; AM اۋېلىڭ 'uila M375b; Ph ئەڭ ئەڭ يېلى P13:13, ئەڭ ئەڭ يېلى *yile-s-i* [PL-ACC] P13:4.
- \**yje* ‘joint’. UM ᠢᠵᠴ yj-a D11:166b2; SM 兀也 *uje* N18/1:11; AM اوپا 'uja M382b.
- \**ykē* ‘word’. UM ᠢᠶڭ yka D2:1; SM 兀格 *uke* N16/1:9; AM اوڭە 'ukä M373a; Ph ئەڭ يەڭ 'yge Z5:30.
- \**ykʰy* ‘to die’. UM ᠢᠶກᠸᠴᠳᠴᠳᠴ yku-ksat [PSTP] D14:5; SM 兀竄 *ukʰu* N24/1:15; AM اوڭو 'uku M378b; Ph ئەڭ يەڭ يكʰو P7:b2.
- \**ynije/n* ‘cow’. SM 兀你延 *unien* N121/3:38; AM اونالىان 'unajan M381b.
- \**yntyr* ‘high’. UM ᠢᠶந்தர் yndur D15:3; SM 溫都兒 *untur* N64/1:45; AM اوندور 'undur M276b; Ph ئەڭ يەڭ يندور yndur P12:3.
- \**ytýr* ‘day’. UM ᠢᠶந்தர் ydur D10:18a5; SM 兀都兒 *utur* N5/1:3; AM اودور 'udur M273a; Ph ئەڭ يەڭ يدۇر ydyr P13:8.

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## THE MONGOLIC LANGUAGES<sup>1</sup>

In addition to the three fairly well-known languages, Mongolian, Buriad, and Oirad, the Mongolic language group contains the ‘peripheral’ languages Kamnigan, Dagur, Shira Yugur, Monguor, Santa, Bonan, Kangjia, and Moghol. Except for Moghol, which was spoken in Afghanistan, but is now almost extinct, the peripheral languages are spoken in northern China. Mongolian, Oirad, and Buriad are more or less mutually comprehensible. Speakers of these languages have used Classical Written Mongolian, and have had contact with each other throughout history. The peripheral languages differ more.

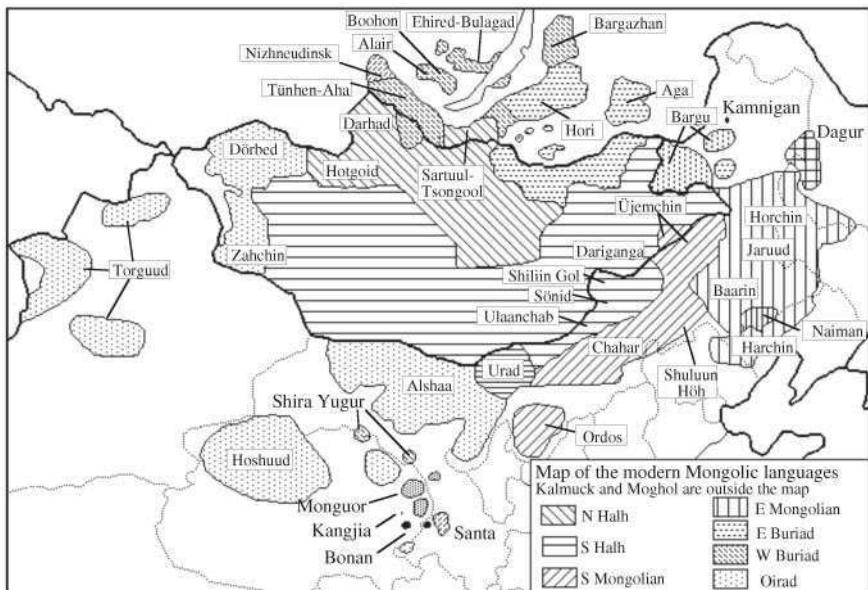
Data from languages other than Halk Mongolian are taken from the published literature.<sup>2</sup> We have modified the transcriptions somewhat to agree with our transcription of Halk Mongolian (see 9.13 for details). For the sake of consistency, only one source has been used for each language. For the peripheral languages in China, we have used the series of descriptions written by scholars from Inner Mongolia University, which are the most comprehensive ones available.

The number of first language speakers for the different languages and dialects given below should be regarded as rough estimates. They are based on censuses and on estimates found in the literature. Mongolian and Chinese censuses record only membership of ethnic groups and not the languages actually spoken. In the Soviet censuses, people were asked what they regard as their native language, but it seems that many who actually speak mainly (or even only) Russian still regard the language of their ethnic group (e.g. Kalmuck or Buriad) as their native language. In China, many members of ethnic Mongolic groups speak only Chinese. This is not seen in the census data, and the estimates of the number of speakers of different languages within an ethnic group are based mainly on *Language atlas of China* (Wurm and Li 1987) and on Ouyang and Zhou (1994). The spread of normative forms of Mongolian (Halk in Mongolia and Chahar in South Mongolia) tends to level out the dialect differences, but exactly how far this process has gone is difficult to ascertain.

We are concerned only with the internal development of inherited Mongolic words in the different languages, and we will not deal with phonological developments due to language contacts, which are quite prominent in the languages spoken in the Gansu–Qinghai area.

<sup>1</sup> For additional sources, see App. I, p. 225.

<sup>2</sup> The sources are given in the sections on the respective languages.



MAP 1. Map of the modern Mongolic languages

### 9.1 MONGOLIAN<sup>3</sup>

The Mongolian language is spoken by about 2.5 million people in the Republic of Mongolia, and by perhaps 2.7 million in South Mongolia (Öbör Mongol) in China (officially known in Chinese as *Neimenggu zizhiqu*, Inner Mongolia autonomous region). We will avoid the Sinocentric terms ‘Outer Mongolia’ and ‘Inner Mongolia’ for these areas. See Chapter 4 for the writing systems in use for Mongolian.

The dialect differences are rather small, and there is no generally accepted dialect division. The dialects are often referred to by names which primarily denote ethnic or political, rather than linguistic, units. To add to the confusion, dialects of Buriad and Oirad are officially regarded as dialects of Mongolian proper both in Mongolia and China.

Except for Üjemchin, all forms of Mongolian proper spoken in Mongolia can be regarded as Halkha dialects, characterized by depalatalization of alveopalatal affricates, changing Old Mongolian \*čh and \*č to c<sup>h</sup> and c, respectively, except when they occurred before \*i. The Üjemchin dialect, which is spoken in South Mongolia and by recent immigrants from South Mongolia to Mongolia, does not have depalatalization. It is regarded as belonging to the Chahar dialect group by Chinese scholars.

<sup>3</sup> For notes and sources, see App. I, 9.1, p. 225.

There is no agreement among Mongolian dialectologists about the division of Halh into subdialects, but a division into Central, Eastern, and Western Halh is often made.

The Mongolian dialects of South Mongolia are divided into six groups by Cenggeltei (1979b) and most other Mongolian dialectologists in China. One of these groups is Alshaa, which we classify as an Oirad dialect. The five others are Horchin, Harchin, Baarin, Chahar, and Ordos.

The Tsongool and Sartuul dialects, whose speakers moved from Mongolia into the South Selenge area in Buriatia in the seventeenth century (Clark 1979; C. Budaev 1992: 22), are usually regarded as southern dialects of Buriad. They have some Buriad morphological features, such as verb agreement, but do not show the characteristic phonological developments of Buriad. At least from a phonological point of view, they must be regarded as dialects of Mongolian proper (cf. Poppe 1955: 23; Buraev 1965; 1987a: 20; 1996: 13; C. Budaev 1977b; Janhunen 1992: 142). The Darhad dialect in north-western Mongolia, spoken by mongolized Oirads, must also be regarded as a dialect of Mongolian although it retains some Oirad features (Sanžeev 1931; 1953: 64f.).

In order to reach a dialect division which is independent of ethnic divisions and state boundaries, we will base it only on phonological criteria. Many different criteria have been used by dialectologists, and we will choose three innovations which seem to be basic (although such a choice must be somewhat subjective): depalatalization of affricates, deaspiration, and loss of palatalized consonants.

Affricate depalatalization made alveopalatal affricates dental before vowels other than *\*i*. For example, Old Mongolian *\*čalahu* ‘young’, which is *čalu* in most Mongolian dialects, became *caču* *залуу* in Halh. Depalatalization is typical for the Halh dialects, and occurs also in Dariganga and in the Shiliin Gol, Ulaanchab, and Sönid dialects, which are classified within Chahar by Chinese Mongolists. We regard them as subdialects of Halh.

Deaspiration makes an initial aspirated consonant unaspirated if another aspirated consonant or a voiceless fricative follows in the same stem. For example, Old Mongolian *\*tʰosun* becomes *tʰɔs* in dialects without deaspiration (e.g. Standard Halh rōc), and *tɔs* in deaspirating dialects. This innovation has spread in a central area, which includes Halh dialects in the south-west, in the east, and in the Gobi (Kara 1962; 1963; Coloo 1967c; 1970), as well as Chahar, Ordos, Naiman, and some other dialects of South Mongolia. The residual area where no deaspiration took place consists of central Halh, including the basis for the standard language, Darhad, and Hotgoid (Möömöö and Mönh-Amgalan 1984) as well as the Eastern dialects (including Harchin, Horchin, Baarin), and probably the Urad dialect. Since different sources give conflicting information on deaspiration in the Halh areas, the boundary shown on the language map is tentative.

Palatalized consonants (which developed before *\*i*) were lost in the Eastern dialects (Harchin, Horchin, Baarin, Jaruud), and in Naiman; as a compensation, the palatalization (umlauting) of the vowel preceding the palatalized consonant became phonemic. For example, Old Mongolian *\*morin* ‘horse’ is *mɔrj*

in Standard Halh (морь), but became *mær* in these dialects.

Using these phonological criteria, the various dialects of Mongolian proper might tentatively be classified into six groups (1). The Urad dialect, which is not extensively documented, seems to have escaped all three innovations.

(1) *Criteria for Mongolian dialect division*

	affricate depalatalization	deaspiration	loss of palatalized consonants
Northern Halh	+	-	-
Southern Halh	+	+	-
Southern Mongolian	-	+	-
Naiman	-	+	+
Eastern Mongolian	-	-	+
Urad	-	-	-

The distribution and approximate number of speakers of these dialects are given in (2).

(2) *Dialects of the Mongolian language*

*Northern Halh* (1.5 mill.): Central Halh, northern part of Western Halh, Darhad (20,000), Hotgoid, South Selenge ‘Buriad’ (Tsongool–Sartuul, 20,000).

*Southern Halh* (1.1 mill.): Southern part of Western Halh, Gobi Halh, Eastern Halh, Southern Halh, Dariganga (40,000), Shiliin Gol (50,000), Ulaan-chab (30,000), Sönid (40,000).

*Southern Mongolian* (350,000): Chahar (100,000), Üjemchin (75,000), Heshigten (20,000), Ordos (130,000).

*Naiman* (100,000)

*Eastern Mongolian* (2.1 mill.): Baarin (110,000), Arhorchin (80,000), Ih Minggan, Ongniud (50,000), Harchin (350,000), Tümd, Hüree (80,000), Monggoljin, Horchin (1.1 mill.), Gorlos (35,000), Heilongjiang Dörbed (35,000), Jalaid (140,000), Jaruud (90,000).

*Urad* (40,000)

The Chahar dialect as spoken in Shuluun Höh (‘Plain Blue’) banner was designated as the standard Mongolian language of China in 1980 (Türgen 1985). What is presented as the standard language of South Mongolia in dictionaries such as *Monggol Kitad toli* (1999) seems to be a compromise between different dialects, however.

We will use examples from three Mongolian dialects: Standard Halh (described in Chapters 1–7), Shuluun Höh Chahar (Dobo 1983a), and the Baarin dialect of Baarin Right banner (Sun et al. 1990). These represent Northern Halh, Southern Mongolian, and Eastern Mongolian, and also exemplify each of the three phonological innovations.

Shuluun Höh Chahar has the phonemes shown in (3) in native words (Dobo 1983a).

(3) *Chahar phonemes*

i	y	u		t <sup>h</sup>	t <sup>jh</sup>	č <sup>h</sup>
ɪ	ʏ	ʊ	p	p <sup>j</sup>	t	č
e	ø	ɔ			s	š
ɛ	œ	a	m	m <sup>j</sup>	n	n <sup>j</sup>
		ɔ				ŋ
					l	ɿ
					r	r <sup>j</sup>
						j

The phonemes of the Baarin dialect are shown in (4) (cf. Sun *et al.* 1990).

(4) *Baarin phonemes*

i	y	u		t <sup>h</sup>	č <sup>h</sup>	
ɪ	ʏ	ʊ	p	t	č	k
	ʏ	ɔ		s	š	x
ɛ	œ	a	m	n	ŋ	
		ɔ			l	
					r	
						j

All dialects of the Mongolian language have a phonemic vowel length contrast which, according to our analysis, is found only in the initial syllable. All dialects also have vowel harmony of the same type as in Halkh.

9.2 BURIAD<sup>4</sup>

Buriad is spoken by some 260,000 persons in Russia, mainly in the Buriad Republic close to Lake Baikal and in the Aga area further to the east, by 60,000 in northern Mongolia, and by 100,000 (including 70,000 Bargu) in the Hölönbuir league in the north-eastern part of South Mongolia (China).

Characteristic phonological features of Buriad are the weakening of \*s to h and fricativization of affricates. Another feature differentiating Buriad from Halkh is the retention of word-final short vowels, for example, *uułə* ‘mountain’ vs. Halkh *uuł* (Old Mongolian \**ahula*).

The so-called Southern Buriad dialect (South Selenge Buriad or Tsongool–Sartuul) has not gone through any of these sound changes and is, as mentioned earlier, classified as a dialect of Mongolian proper by us. Kamnigan is often regarded as a Buriad dialect, but following Janhunen (1992) we regard it as an independent language.

There is no complete agreement about the dialect division of Buriad, but five main dialects may be recognized (C. Budaev 1978; Buraev 1987a: 17 ff.; 1996):

<sup>4</sup> For notes and sources, see App. I, 9.2, p. 227.

(5) *Buriad dialects*

- (a) Eastern Buriad (Hori, Aga, Muhar-Sheber, Tugnui, Hilok, Buriad of Mongolia)
- (b) Northwestern Buriad (Ehiren, Bulagad, Kabansk, North Selenge, Ivalga, Bargazhan, Kachug, Boohon, Ol'hoon, Osa, Baigal-Hudari)
- (c) Southwestern Buriad (Alair, Tünhen, Aha, Ungi, Zakamna)
- (d) Nizhneudinsk
- (e) Bargu

The Northwestern (Ehiren–Bulagad) and Southwestern (Alair–Tünhen or Sajan) dialect groups are often regarded as the two branches of a Western Buriad dialect group. Western Buriad differs from the other dialects by contrasting short *u* and *o* (from Old Mongolian \*y and \*ø) in initial syllables. In the other dialects they have merged to *u*. This development seems to be spreading to some Western dialects (Kachug, Bargazhan, Ivalga), apparently due to the influence of the standard language based on Hori.

The Northwestern dialects differ from Southwestern by having the palatal glide *j* rather than the voiced alveopalatal fricative *ž* (IPA [ʒ]) as the reflex of Old Mongolian \*č before \*i (e.g. Ehren (NW) *jel* ‘year’ vs. Tünhen (SW) and Hori (E) *žel*; OM \*čil).

The speakers of the Ivalga and North Selenge dialects spoken to the south-west of Ulan-Ude originally came from an area to the west of Lake Baikal. According to Cyrenov (1996), the Ivalga dialect is closely related to Ehren.

Nizhneudinsk, the westernmost Buriad dialect, is conservative in the sense that it has retained \**k*<sup>h</sup> unchanged as a stop (with velar and uvular allophones depending on the vowel harmony class of the word). The easternmost dialect, Bargu, spoken in Hölönbuir league in China, consists of two variants, Old and New Bargu. Old Bargu has merged \*s and \**k*<sup>h</sup> to x. For example, Old Mongolian \**sara* ‘moon’ and \**k*<sup>h</sup>*ara* ‘black’ both became *xar* in Old Bargu (Standard Hori Buriad *harə*, *xarə*).

The Eastern Buriads traditionally used Classical Written Mongolian as their written language. A special Buriad variant of the Mongolian alphabet was devised in 1905 by Agyan Doržiev, who took the Oirad Clear Script as a model. The Cyrillic alphabet was used for writing Buriad from about 1840 in Western Buriatia (Montgomery 1994: 141), but after 1917 the Mongolian alphabet was introduced there as well. It was officially replaced with a Latin-based script in 1931. At first, Halh Mongolian was used as the dialect basis for this script, but this was almost immediately changed to the South Selenge (Tsogool–Sartuul) dialect, which is phonologically a dialect of Mongolian proper rather than Buriad. The dialect basis was changed to Hori in 1936, and it was decided in 1938 that the Cyrillic alphabet should replace the Latin one. Printing in the old Mongolian alphabet ceased in 1937, and printing in the Cyrillic alphabet started in 1939–40 (Šagdarov 1969). The Buriad Cyrillic alphabet is described briefly in section 4.2. In China and Mongolia, Buriad is regarded as a dialect of Mongolian, and the speakers use the respective forms of the Mongolian written language.

Our Buriad data is taken from Čeremisov's (1951) dictionary of the standard language, based on Hori. The phonemes shown in (6) occur in indigenous words (cf. Buraev 1959; 1987a; Buraev, Bažeeva, and Pavlova 1975; Soktoeva 1988; 1989b).

(6) *Buriad phonemes*

i	u		t <sup>h</sup>	t <sup>jh</sup>				
ə	ʊ	b	b <sup>j</sup>	d	d <sup>j</sup>	g	g <sup>j</sup>	
e	o			s	š	x	x <sup>j</sup>	h
a	ɔ			z	ž			
		m	m <sup>j</sup>	n	n <sup>j</sup>			
				l	l <sup>j</sup>			
				r	r <sup>j</sup>			
					j			

Short *e* is pronounced [ɯ] and long *ee* is [eɪ]. According to Zolhoev (1972; 1973a), orthographic single vowels in non-initial syllables are phonetically reduced and epenthetic in the sense that both their quality and their place in a word can be predicted by rules, as is the case in Mongolian proper. We will write them with the schwa symbol. Unlike Mongolian schwas, Buriad schwas can appear word-finally, where they contrast with zero, as in *garə* *gapa* 'to go out' vs. *gar rap* 'hand' (both are *gar rap* in Halh), and they must be regarded as phonemes in this position. We adopt Zolhoev's solution which implies that vowel length is contrastive only in the initial syllable, as in our analysis of Mongolian. Thus we analyse orthographic single vowels in non-initial syllables as ə (e.g. алтан *altʰən* 'gold'; Монгол *mɔŋəl* 'Mongol'; морин *mr̩jən* 'horse') and orthographic double vowels in non-initial syllables as (short) phonemic vowels (e.g. эмсэл *emel* 'saddle'; улаан *ulan* 'red'; Буряад *burjad* 'Buriad').

We write the Buriad unaspirated stops as voiced, according to our informal observations (see 2.1.2), although more data is needed to clarify this point. The nasals [n] and [ŋ] stand in complementary distribution, [ŋ] occurring word-finally and before velar consonants, and [n] in all other environments (Zolhoev 1963c; Buraev 1987a: 46, 63). We regard them as allophones of /n/. Like Mongolian, Buriad has both pharyngeal harmony and rounding harmony.

### 9.3 KAMNIGAN<sup>5</sup>

Kamnigan is spoken by about 2,000 persons. Most of them live in China, by the river Mergel, north of Hailar. They only came there after the Russian revolution in 1917, and some speakers may still remain in Russia. There may also be a few Kamnigan speakers in north-eastern Mongolia, by the Onon river. The Kamnigan are bilingual in Evenki and their Mongolic language. The material used here

<sup>5</sup> Kőhalmi (1959); Mišig (1961); Damdinov (1962; 1968; 1975; 1977; 1988); Rinčen (1969); Doerner (1985a).

is from the Urul'ga dialect of Manchurian Kamnigan Mongol (Janhunen 1990a; 1992; 2003c). This dialect has certain features in common with Buriad (the developments  $*\phi > u$ ,  $*s > h$  in syllable onset position, and  $*s > t$  in coda position). These features are not found in the Man'kovo dialect (Janhunen 1992), which is more similar to Halh, at least superficially. In the Urul'ga dialect, the reflexes of the Old Mongolian onset  $*s$  are [š] before i and [h] in other positions (disregarding some complications due to recent loan-words), and in the Man'kovo dialect they are [š] and [s]. We regard [š] and [h] as allophones of /h/ in the Urul'ga dialect. The phonemes shown in (7) occur in the Urul'ga dialect.

(7) *Kamnigan phonemes*

i	u	$t^h$	$k^h$
	ʊ	p	t
e	ɔ		k
a		c <sup>h</sup>	
		c	h
m	n		ŋ
	l		
r			
		j	

Unlike the case of Buriad and Mongolian, the reflexes of Old Mongolian  $*u$  and  $*a$  (and  $*y$  and  $*e$ ) contrast in non-initial syllables in Kamnigan. For example, the Old Mongolian words  $*alθ'an$  'gold' and  $*nasun$  'age' became  $alθ'a$ ,  $nahu$  in Kamnigan, but  $alθən$ ,  $nahən$  in Buriad. Thus the reflexes of Old Mongolian short non-initial vowels must be analysed as phonemic vowels in Kamnigan, and consequently vowel length is phonemic in both initial and non-initial syllables. Kamnigan has pharyngeal vowel harmony as well as rounding harmony.

#### 9.4 OIRAD<sup>6</sup>

The Oirad language has about 200,000 speakers in western Mongolia, 210,000 in China, and 140,000 in the Kalmuck Republic north-west of the Caspian Sea in Russia. The Kalmucks are descendants of Oirad groups who settled in Russia during the 1630s. Their language is basically the same as that spoken by those Oirads who remained in the east or returned there during the eighteenth century, but because it has its own written standard and has been influenced by Russian, it is regarded as an independent language by some researchers. We regard Kalmuck as an Oirad dialect, however. The entire Kalmuck population was deported and spread over large areas of Siberia and Kazakstan in 1943. When they were allowed to return in 1957, Russian was made the only language of instruction in Kalmuck schools, but since the beginning of the 1990s teaching in Kalmuck has been intro-

<sup>6</sup> For notes, see App. I, 9.4, p. 227.

duced (Pjurbeev 2001a). Like most other Oirads, the Kalmucks are Buddhists. A group of at least 2,500 Muslim (Sart or Ööld) Kalmucks live in Kyrgyzstan, near Karakol (previously Prževal'sk) to the south of Ysyk Köl.

Oirad is characterized by its conservative vowel system, which is essentially the same as in Old Mongolian. Another salient phonological feature is the strong reduction of non-initial short vowels. As illustrated in Figure 2.6, syllabic sonorants occur even in careful lexical pronunciation where Hahl has a schwa vowel, as in Kalmuck [baɪ̯tʃ] vs. Hahl [paɪ̯t̪ɑ̯r] 'hero'.

The dialect differences seem to be small. The main dialects in Mongolia are Dörbed (70,000), Bayad (45,000), Zahchin (30,000), Urianhai (30,000), Torguud (15,000), and Ööld (15,000). In China, the Torguud dialect (130,000) is spoken in Xinjiang, and the Hoshuud dialect (40,000; also known as the Kök Nuur or Qinghai dialect, or as Deed Mongol 'Upper Mongol') in Qinghai.

The Alshaa (Alshaa–Ejnee) dialect (40,000) spoken in Alshaa league in the western part of South Mongolia has some Mongolian and some Oirad features. Cenggeltei (1957–8) classified it together with Hoshuud as forming a dialect intermediate between Xinjiang Torguud Oirad and Mongolian proper. In Cenggeltei (1979b), he reclassified it as belonging to the 'Inner Mongolian dialect', that is, Mongolian proper, while Hoshuud was classified as Oirad. Since they have typical Oirad vowel systems we regard both Alshaa and Hoshuud as Oirad dialects.

The Kalmucks are divided into two main dialects: Dörbed, spoken in the western part of Kalmuckia, and Torguud, spoken in the eastern part. The Buzaawa dialect spoken by the Don Kalmucks is close to Dörbed. There is also a small Hoshuud group, whose dialect is similar to Torguud. One major difference between Dörbed and Torguud is the opening of the rounded non-open vowels (\*u > o and \*y > φ) in certain contexts in Dörbed (see 10.2; see also Kičikov 1967a).

The language of the Dörbed of Heilongjiang province in China, as described by Bao Xianglin (1985) and Zhang and Shaobu (1990), has apparently been Mongolized, having a Mongolian rather than Oirad vowel system. Some Oirad dialects in Mongolia are also changing under the influence of Mongolian proper. According to Sanžeev (1953: 62), Bayad, Hotgoid, and Zahchin are intermediate between Oirad and Hahl (cf. also Vladimircov 1923). This is confirmed for Bayad by Ölje-yibürin (1992) whose description shows it to be similar to Northern Hahl. Zahchin seems to have undergone a vowel shift of the Mongolian type, judging from X-ray pictures given by Coloo (1965).

In China and Mongolia, Oirad is officially regarded as a dialect of Mongolian, and the Oirads are expected to use the Mongolian written language of the respective country. A special Oirad alphabet, the 'Clear script' (*todo biciq*), was designed by Zaya Pandita in 1648 and is still used by some of the Oirads in China, although the official policy since 1982 is that the Oirads should abolish the Clear script and use Mongolian as their written language (Svantesson 1991b). The Clear script is based on the Mongolian alphabet but is more phonematic and closer to the spoken language.

In Russia, the Cyrillic alphabet has been used for printing Kalmuck since 1919, and it was made the only official alphabet in 1925. It was replaced with the Latin

alphabet in 1930, but Cyrillic was reintroduced in 1938. The written language is based mainly on the Torguud dialect, but incorporates some Dörbed features.

Oirad is represented here by Kalmuck, with words taken from Muniev's (1977) dictionary. Cyrillic Kalmuck is described briefly in section 4.2. The Cyrillic script does not write schwas, and thus treats them as epenthetic vowels, but Pavlov (1983: 60) seems to regard them as phonemes. There is some variation in the use of reduced vowels (see Bitkeev 1976), and even the two authoritative dictionaries by Muniev (1977) and Omakaeva (2000) often disagree about the place where reduced vowels are pronounced (cf. also Street 1962 and Bitkeev 1964). We follow the Cyrillic script and analyse Kalmuck reduced vowels as epenthetic, absent from the phonological representation. This implies that vowel length is distinctive only in initial syllables. The Kalmuck phonemes are shown in (8) (cf. Pavlov 1963b; 1968; 1983; and Bitkeev 1965).

(8) *Kalmuck phonemes*

i	y	u	p <sup>h</sup>	t <sup>h</sup>	(t <sup>jh</sup> )	k <sup>h</sup>
e	ø	o	b	d	(d <sup>j</sup> )	g
ɛ		a	c <sup>h</sup>	č <sup>h</sup>		
				ž		
			s	š	x	
			z			g
m	n	n <sup>j</sup>		ŋ		
l		p̪				
r						
w		j				

We write the Kalmuck unaspirated stops as voiced, according to our informal observations (2.1.2), although more data are needed to clarify this point.

Oirad has palatal (back ~ front) vowel harmony, but no rounding harmony. The Alshaa and Hoshuud dialects have rounding harmony, however. For instance, the word 'beast', Old Mongolian \*k<sup>h</sup>orehesyn, is g<sup>h</sup>oresn in Kalmuck and Xinjiang Oirad, but g<sup>h</sup>orøs in Alshaa and Hoshuud (Sun et al. 1990; Gereltü 1992).

## 9.5 DAGUR<sup>7</sup>

Dagur is spoken in China, mainly in the Morin Dawaa area in the eastern part of South Mongolia, and in the Nonni River region to the north-east of Qiqihar in Heilongjiang province. There are also some speakers in the Hailar area (South Mongolia) and the Ili area in Xinjiang. Traditionally, the Dagur are shamanists or Lamaists.

The four areas correspond to four main dialects (Todaeva 1986): the Buthaa dialect (45,000) spoken in Morin Dawaa, the Qiqihar dialect (25,000), the Hailar dialect (5,000), and the Xinjiang dialect (4,000). The dialect differences are relatively

<sup>7</sup> For sources on Dagur, see App. I, 9.5, p. 228.

large. The Hailar dialect has lost Old Mongolian initial \**h* which is preserved in Buthaa.

During the nineteenth century, some authors used the Manchu alphabet for writing Dagur (Engkebatu 1994b; 1996). The Cyrillic alphabet was introduced in 1957, but it was abolished the same year (Kara 1995). A writing system using the Latin alphabet was devised in 1981. It is based on the rather conservative Buthaa dialect. The Dagur normally use Chinese or Mongolian as their written language, however.

The Dagur data used here is taken from Engkebatu (1984; 1988), who describes the Buthaa dialect. The phonemes shown in (9) occur in indigenous words. A feature which is unique for a Mongolic language is the existence of labialized consonant phonemes.

(9) *Buthaa Dagur phonemes*

i	u		t <sup>h</sup>	t <sup>wh</sup>	t <sup>jh</sup>	č <sup>h</sup>	k <sup>h</sup>	k <sup>wh</sup>	k <sup>jh</sup>	
y		p	p <sup>j</sup>	t	t <sup>w</sup>	t <sup>j</sup>	č	k	k <sup>w</sup>	k <sup>j</sup>
ɛ	a	ɔ		s	s <sup>w</sup>	š	x	x <sup>w</sup>	x <sup>j</sup>	
		m	m <sup>j</sup>	n	n <sup>w</sup>	n <sup>j</sup>				
				l	l <sup>w</sup>	ł				
				r		r <sup>j</sup>				
		w				j				

Engkebatu writes only three short vowels, ɔ, i, u, in non-initial syllables. Since Dagur has strong vowel reduction similar to that in Mongolian proper, we interpret these vowels as schwas and write them as ə, assuming that their quality is coloured by the preceding consonant. This analysis is possible because there are palatalized and labialized consonant phonemes in Dagur. We assume that non-initial short [i] is a schwa preceded by a palatalized or alveopalatal consonant, or j, and that non-initial short [u] is a schwa preceded by a labialized consonant or w. For example, we interpret the sequences written by Engkebatu as *di* and *du* as *t<sup>j</sup>ə* and *t<sup>w</sup>ə*, respectively. We regard these schwas as non-phonemic, as in Mongolian, and thus analyse Engkebatu's long non-initial vowels as short, so that there is a vowel quantity contrast only in the initial syllable. Since we reserve the symbol ə for schwas, we write other occurrences of ə in Engkebatu's material as y. Dagur has pharyngeal vowel harmony, with the vowels divided into three classes, pharyngeal (a, ɔ, ɛ), non-pharyngeal (y), and neutral (i, u). There is also a restricted form of rounding harmony, so that ɔ is followed by ɔ (and not by a) in suffixes.

## 9.6 SHIRA YUGUR<sup>8</sup>

Shira Yugur (East Yugur; Yellow Uigur) is spoken by some 4,000 people in two small areas on the border between Gansu and Qinghai provinces. The speakers

<sup>8</sup> Kotwicz (1939); Todaeva (1966; 1975; 1997f); Kim Pang-han (1969); Jagunasutu (1981b; 1987a); Bulucilagu (1982; 1985b; 1986; 1989; 1991; 1992); Satō (1987); Erdenicugla (1988); Möngkebuyan (1989); Chuluu (1994a); Nugteren (2003).

are Lamaists. The language is not written, and the speakers use Chinese as their written language.

The sources used are Bulucilagu and Jalsan (1992) and Bulucilagu (1985a). They describe the Kangle dialect, but the differences between this and the other dialect, Qinglong, are reported to be small. The phonemes shown in (10) occur in indigenous words.

(10) *Shira Yugur phonemes*

i	y	u	p <sup>h</sup>	t <sup>h</sup>	č <sup>h</sup>	k <sup>h</sup>
		ʊ	p	t	č	k
e	ø	ɤ	o		s	š
a	ɔ		m	n	x	h
				l		
				r		
w					j	

There is contrastive vowel length. Vowel harmony is fairly complicated. The vowels can be divided into three classes: pharyngeal (ʊ, a, ɔ), non-pharyngeal (u, e, ø, o), and neutral (i, y, ɤ). There is rounding harmony as well. According to Bulucilagu and Jalsan (1992), there are numerous exceptions, especially to rounding harmony.

## 9.7 MONGUOR<sup>9</sup>

Monguor (White Mongol; Tu) is spoken mainly in the easternmost part of Qinghai province, with the largest concentration in the counties Huzhu (60,000 speakers) and Minhe (30,000). The dialect differences are quite large, and it has been suggested that Huzhu Monguor (Mongghul) and Minhe Monguor (Mangghuer) are separate languages (Slater 1998; 2003a, b). As far as the phonology of indigenous words is concerned, the differences are not greater than between the dialects of Dagur or Bonan, and for this reason we have preferred to treat the Monguor variants as dialects of one language, and have retained the traditional name form Monguor.

In 1979, a writing system based on the Latin alphabet was devised for the Huzhu dialect. It has been used to some extent in primary education since 1981 (Kakudô 1990c; Jagunasutu 1992).

The sources used for Monguor are Cenggeltei (1991) and Qasbagatur (1986), who describe the Huzhu dialect. The phonemes shown in (11) occur in indigenous words.

<sup>9</sup> Mostaert and de Smedt (1929–31); Mostaert (1931); Nomura (1959a); Róna-Tas (1960b; 1962; 1966); Jagunasutu (1964; 1981a; 1987b); Kim Pang-han (1969); Todaeva (1973; 1997e); Doerfer (1974); Saitô (1983; 1993a); Mudrak (1986); Xi Yuanlin (1986); Kakudô (1987b; 1988; 1990a, b; 1994; 1997); Cenggeltei (1988, 1997); Kuz'menkov (1988b); Li Keyu (1988); Chuluu (1994d); Böke (1998; 2001); Li Meiling (2001); Georg (2003b). *Minhe dialect*: Jagunasutu and Li (1982); Slater

(11) *Huzhu Monguor phonemes*

i	u	p <sup>h</sup>	t <sup>h</sup>	č <sup>h</sup>	k <sup>h</sup>	
e	o	p	t	č	k	q
a		c				
		s	š	x		
m	n			ŋ		
		l				
r						
w	j					

Monguor has lost vowel harmony. There is contrastive vowel length in Huzhu, but it has been lost in Minhe: compare Minhe *ima* ‘goat’, *tʰosi* ‘fat’, *xuta* ‘bag’ with Huzhu *imaa*, *tʰoosi*, *xuuta*. Another dialect difference is the loss of some syllable final consonants in Minhe: *ter* ‘gown’, *qar* ‘fire’, *say* ‘comb’ vs. Huzhu *teel*, *qal*, *sam*.

9.8 SANTA<sup>10</sup>

Santa (Dongxiang) is spoken by some 270,000 persons in an area to the south-west of Lanzhou in Gansu province. The speakers are Muslims. A Santa script based on the Latin alphabet was developed around 1980 (Schwarz 1982), but has not been used very much. The school education is in Chinese.

The data are taken from Böke (1983a; 1986). He describes the Suonanba dialect (120,000 speakers). The other two main dialects are Wangjiaji (110,000) and Sijiaji (40,000); the dialect differences are reported to be small. The phonemes shown in (12) occur in indigenous words. There is no contrastive vowel length, and only remnants of vowel harmony.

(12) *Santa phonemes*

i	u	u	p <sup>h</sup>	t <sup>h</sup>	č <sup>h</sup>	k <sup>h</sup>	q <sup>h</sup>	
e		o	p	t	č	k	q	
a			s	š	x			
			m	n	ŋ			
			l					
			r					
w		j						

(1998; 2003a, b).

<sup>10</sup> Todaeva (1959; 1960b; 1961; 1997c); Nasunbayar (1961; 1981; 1987a); Liu (1965; 1981); Bulag (1981; 1988; 1997); Böke (1982; 1983b; 1985; 1998; 2001); Kakudô (1982b; 1995); Nadamid (1984);

9.9 BONAN<sup>11</sup>

Bonan is spoken by 4,000 persons in the Tongren area in the easternmost part of Qinghai province, and by 5,000 in Dahejia township and other parts of Jishishan autonomous county close to Linxia in Gansu province. The dialect differences are reported to be rather large. The speakers of Tongren Bonan are Lamaists who belong to the Tu (Monguor) ethnic group. Their school education is given in Tibetan. The speakers of Jishishan Bonan are Muslims and belong to the Bonan ethnic group. Their school education is given in Chinese. Bonan has no written language.

Our source is Chen (1986a; 1987), who describes the Nianduhu variant of the Tongren dialect. The phonemes shown in (13) occur in indigenous words. There is contrastive vowel length in the Tongren dialect, but it has been lost in Jishishan (Chen 1989–90). There is no vowel harmony.

(13) *Bonan phonemes*

i	w	u	p <sup>h</sup>	t <sup>h</sup>	č <sup>h</sup>	k <sup>h</sup>
e		o	p	t	č	k
a			s	š	x	h
			m	n	ŋ	
			l			
			r			
	w			j		

9.10 KANGJIA<sup>12</sup>

The Kangjia language is spoken by about 300 persons in the Kangyang commune in Jainca county in the easternmost part of Qinghai province. This language was first investigated by Wu Chengyi in 1988. It is usually regarded as being close to Bonan, but there are some phonological similarities to Shira Yugur as well. We use the description by Secencogtu (1999). The phonemes shown in (14) occur in indigenous words.

(14) *Kangjia phonemes*

i	w	u	p <sup>h</sup>	t <sup>h</sup>	č <sup>h</sup>	k <sup>h</sup>
		o	p	t	č	k
e	y		s	š	x	h
a	ɔ		m	n	ŋ	
			l			
			r			
	w			j		

Ma and Liu (1986); Ibrahim (1988); Chuluu (1994b); Field (1997); Stephen Kim (2003).

<sup>11</sup> Todaeva (1963; 1964; 1979; 1997a); Böke and Chen (1981); Böke and Liu (1982); C. Li (1986); Nasunbayar (1987b); Chen (1989–90; 1994b); Chuluu (1994e); Böke (1998; 2001); Kögjiltü (2003).

There is no contrasting vowel length in Kangjia. There is a limited form of vowel harmony, where the vowels are divided into three classes, pharyngeal (*a, ɔ, ʊ*), non-pharyngeal (*e, o, u*), and neutral (*i, u, y*).

### 9.11 MOGHOL<sup>12</sup>

Moghul is almost extinct, but may still be spoken in a few villages in Herat province in Afghanistan by descendants of troops from the time of the great Mongol conquests. Moghol data are taken from Weiers (1972). The phonemes shown in (15) occur in indigenous words.

(15) *Moghul phonemes*

i	u	p	t	č	k	q
e	o	b	d	đ	g	g
a			s	š	x	
		m	n		ŋ	
			l			
			r			
				j		

According to Ramstedt (1906) and Weiers (1972), the two series of stops/affricates are voiceless ~ voiced in Moghol.

Earlier researchers have noted long vowels in Moghol (Ramstedt 1906; Ligeti 1955; 1964). According to Weiers (1970a), these long vowels are not contrastive, and are partly due to stress and partly due to the earlier researchers' expectations of finding long vowels. Consequently, Weiers does not write long vowels, and we follow him. Moghol does not have vowel harmony. Moghol has been written sporadically with the Arabic alphabet; see Weiers (1992–3).

The Hazara of Iran and Afghanistan regard themselves as descendants of Mongol troupes. Their Iranian language is usually regarded as a dialect of Dari, but it contains some Mongolic words (Efimov 1965).

### 9.12 OTHER RELATED LANGUAGES

There are a few languages which have some relationship to the Mongolic languages. They will be mentioned briefly here, but material from them is either irrelevant or not sufficiently known to be very useful in Mongolic historical phonology.

Kitan, the language of the Liao dynasty of north-eastern China (916–1125), is believed to have been Mongolic or related to Mongolic. The Dagur are sometimes regarded as descendants of the Kitan. Although much progress has been made in

<sup>12</sup> Böke (1995; 2001); Secencogtu (2002).

<sup>13</sup> Pritsak (1964); Böke (1987; 1996; 1997); Kuz'menkov (1997); Weiers (2003).

deciphering the two different scripts used for Kitan (see e.g. Janhunen 2003e), the available material is too limited to be very useful in Mongolic historical phonology.

The so-called Benren ('original people') in Shidian county in Yunnan province in south-western China speak a language of the U language group, which belongs to the Angkuic sub-branch of the Palaungic branch of Austroasiatic (Svantesson 1988b). Shidian U has been investigated by Chen (1994a; 1995a) and by Yan and Zhou (1995: 178ff.). Chen found that part of the vocabulary is similar to Mongolic, in particular Dagur. Furthermore, some fifteenth century inscriptions containing Kitan characters have been found in the area. Chen has drawn the conclusion that the Benren are Kitan descendants. However, the linguistic evidence for this is not entirely convincing, and the question needs further study.

There is a group of about 5,000 people in Tonghai county in Yunnan who regard themselves as ethnic Mongols, but who have assimilated linguistically to their neighbours and now speak the Khatso language, which belongs to the Loloish group of the Tibeto-Burman languages (He 1989; 1998). Another group of about 11,000 ethnic Mongols live in Yanyuan county in Sichuan. They speak the Tibeto-Burman language Naxi (Ouyang and Zhou 1994).

The Wutun language is spoken in Tongren county in Qinghai province by about 2,000 persons who are officially classified within the Tu (Monguor) ethnic group, although they regard themselves as Tibetans. Apparently, Wutun is a Chinese dialect which acquired inflectional morphology due to extensive contact with Tibetan and Mongolic languages. The speakers of Wutun are bilingual in their language and Tibetan. (See Chen 1986b and C. Li 1986.)

The Tangwang language is spoken by about 20,000 persons in some ten villages, including Tangjiacun and Wangjiacun, in the north-eastern part of the Dongxiang autonomous county in Gansu province (Ibrahim 1985). The speakers are officially classified as Hui (Chinese Muslims) or Dongxiang (Santa). According to Ibrahim, most of the vocabulary is Chinese, but like Wutun, Tangwang has inflectional morphology, in this case derived from Santa.

### 9.13 COMPARATIVE VOCABULARY

This section contains a comparative vocabulary of the Mongolic languages with data taken from the sources referred to above. The vocabulary provides examples for the historical development outlined in Chapter 10. We have modified the transcriptions of the sources somewhat so that they agree with our transcription of Mongolian, and we have also tried to eliminate over-differentiation which sometimes occurs in the sources, by changing symbols for allophones to those for the phoneme. All changes we made of the transcriptions in the original sources are shown in Table 9.1.

Except for Halh, Buriad, Kalmuck, and Moghol, the data come from Chinese publications, which use IPA symbols with some modifications. The two series of

TABLE 9.1 Transcription changes

original	changed to
ă	ShY <i>v</i> .
æ	Mgr <i>a</i> .
े	Dag <i>ɛ</i> .
ө	Cha, Baa, Dag, ShY, KJ <i>v</i> ; San <i>e</i> ; Bon <i>uu</i> .
ۍ	Mgr <i>i</i> .
ے	Mgr <i>e</i> .
ۑ	Mgr <i>a</i> .
ۅ	Baa, Kmн, Dag <i>ɔ</i> .
ۅ	Baa, Bon, KJ <i>o</i> .
ۅ	Cha <i>u</i> .
ۅ	Mgr <i>o</i> .
ۅ	ShY <i>v</i> .
ۉ	Baa, Kmн, ShY, KJ <i>u</i> .
ۊ	ShY <i>v</i> .
ۊ	Mgr <i>o</i> .
ۊ	Baa, ShY, KJ <i>u</i> .
ۊ	Kmn <i>u</i> .
ۊ	Mgr <i>u</i> .
ۊ	Cha, Baa, Kmн, Dag, ShY, Mgr, San, Bon, KJ <i>p</i> .
ۊ	ShY <i>w</i> .
ۊ	Kmn <i>c<sup>h</sup></i> .
ۊ	Bon ڦ; ShY <i>hj</i> .
ۊ	Mgr ڦ; San <i>s</i> .
ۊ	Cha, Baa, Kmн, Dag, ShY, Mgr, San, Bon, KJ <i>t</i> .
ۊ	Mgr <i>c</i> .
ۊ	Mgr, Bon ڦ; San <i>t</i> .
ۊ	San ڦ.
ۊ	Cha, Baa, Dag, ShY, KJ ڦ.
ۊ	Bon, KJ <i>h</i> ; Mgr, San <i>x</i> .
ۊ	Cha, Baa, Kmн, Dag, ShY, Mgr, San, Bon, KJ <i>k</i> .
ۊ	Mog <i>G</i> .
ۊ	ShY <i>k<sup>h</sup></i> .
ۊ	Mgr, San, Bon <i>q</i> ; ShY, KJ <i>k</i> .
ۊ	Dag, ShY, KJ <i>k</i> .
ۊ	San <i>x</i> .
ۊ	Bon <i>h</i> .
ۊ	Kmn <i>c</i> .
ۊ	Kmn, Dag, ShY, Mgr, San, Bon, KJ <i>k<sup>h</sup></i> .
ۊ	ShY <i>hl</i> .
ۊ	ShY <i>hn</i> .
ۊ	Kmn <i>y</i> .
ۊ	Dag <i>n</i> .
ۊ	ShY, Mgr, San, Bon, KJ <i>p<sup>h</sup></i> .
ۊ	ShY, KJ <i>k<sup>h</sup></i> ; San <i>q<sup>h</sup></i> .
ۊ	ShY, KJ <i>k</i> ; San <i>q</i> .

s	Kmn <i>h</i> .
š	Mgr, San, Bon <i>š</i> .
ʃ	Cha, Baa, Dag, ShY, KJ <i>š</i> .
t	Cha, Baa, Kmn, Dag, ShY, Mgr, San, Bon, KJ <i>t<sup>h</sup></i> .
tç	Mgr, Bon <i>č<sup>h</sup></i> ; San <i>t<sup>h</sup></i> .
tš	San <i>č<sup>h</sup></i> .
tʃ	Cha, Baa, Dag, ShY, KJ <i>č<sup>h</sup></i> .
v	Mgr, Bon <i>w</i> .
v	KJ <i>w</i> .
x	Kmn <i>h</i> .
χ	Bon, KJ <i>x</i> .
y	Kmn <i>j</i> .

---

stops are indicated by the symbols for voiceless and voiced stops, while the texts of the publications describe them as voiceless aspirated and voiceless unaspirated, respectively. When we use these sources, we write the IPA symbols for aspirated and unaspirated voiceless stops instead.

Monguor *c*, *g* and Bonan *ç*, *g* seem to be in complementary distribution, at least in indigenous words. We write them as *š*. We analyse Santa *tç*, *dz*, *c* as allophones of /t<sup>h</sup>/*t*, *s*/*š* before /i/. The Shira Yugur and Kangjia uvulars written *q* and *g* occur only in words with pharyngeal vowels and are analysed as allophones of /k<sup>h</sup>/ and /k/, respectively, by us. We regard the fricatives *z* and *y* as allophones of /k/ between voiced sounds in these languages. Similarly, Santa *z* is an allophone of /q/, and Dagur *y* is an intervocalic allophone of /k/. Monguor *f*, *x*, Santa *f*, *h*, *x*, Bonan *f*, *h*, and Kangjia *f*, *h* do not seem to contrast in indigenous words, *f* occurring only before *u* or other rounded vowels; we regard them as allophones of /x/ (Monguor, Santa) or /h/ (Bonan, Kangjia). Dagur *y* is an allophone of /n/ before velars.

Short vowels in non-initial syllables in the sources for Chahar, Baarin, Buriad, and Dagur are interpreted as non-phonemic schwas, written *ə*, and what the sources write as long vowels in non-initial syllables are written here as short vowels. We use the symbol *ə* exclusively for schwa vowels. Shira Yugur [ã, û, ß] are regarded as allophones of /v/. Monguor [æ] and [ɤ] are allophones of /a/, [ɛ] is an allophone of /e/, [ɔ] an allophone of /i/, [ʊ] and [ɔ] are allophones of /o/, and [yl] is an allophone of /u/. Chahar nasalized vowels are analysed as combinations of vowels and *y* by us.

In some cases a source gives different forms for the same word, for instance Monguor *ite ~ te* ‘to eat’, with or without an initial vowel. We regard the form with a vowel as the main form and the other one as a reduced form.

	'burden'	'mountain'	'eld. brother'	'motley'	'which'	'fruit'
OM	*ač <sup>h</sup> ihan	*abula	*ak <sup>h</sup> a	*alak	*ali	*alima
Hlh	ač <sup>h</sup> a	uuł	ax	ałəg	ał <sup>j</sup>	ał <sup>j</sup> em
	ачаа	үүл	ax	алаг	аль	алим
Cha	ač <sup>h</sup> a	uul	ax	alək	el <sup>j</sup>	el <sup>j</sup> em
Baa	eč <sup>h</sup> a	uul	ax	alək	el	
Bur	ašan	uulə	axə	aləg	alən	aləmə
Kmn		ɔla	ak <sup>h</sup> a			
Klm		uul	ax	alg	al <sup>j</sup>	al <sup>j</sup> mn
Dag	at <sup>h</sup> ɛ	aul	ak	alar		al <sup>j</sup> əm
ShY	hčan	uula	aka	alak	aaly	alma
Mgr	ščaa	ula	aqa	alaq	ali	alima
San	ač <sup>h</sup> an	ula	aqa		ali	alima
Bon	ač <sup>h</sup> an	uula	aqa		anu	alma
KJ	ač <sup>h</sup> ɔ	ula	aka	alək	ani	alima
Mog		aulo				

	'gold'	'mouth'	'life'	'to take'	'clean'	'method'
OM	*al <sup>h</sup> tan	*aman	*amin	*ap	*arihun	*arka
Hlh	ałt <sup>h</sup>	am	am <sup>j</sup>	aw	ar <sup>j</sup> uŋ	arəg
	алт	ам	амь	ав	ариун	апра
Cha	alt <sup>h</sup>	am	em <sup>j</sup>	ap	eruŋ	arək
Baa	alt <sup>h</sup>	am	em	ap	aron	arək
Bur	alt <sup>h</sup> ən	amən	am <sup>j</sup> ən	abə	ar <sup>j</sup> uŋ	argə
Kmn	alt <sup>h</sup> a			ap		
Klm	alt <sup>h</sup> n	amn	emn	aw	eryn	arg
Dag	alt <sup>h</sup>	am	am <sup>j</sup>	au	arun	arək
ShY	alt <sup>h</sup> an	aman	am <u>y</u> n	ap	aruŋ	arka
Mgr	xaltan	ama	amin	awu	arin	
San	ant <sup>h</sup> an	aman	amiŋ	aki	aruŋ	
Bon	alt <sup>h</sup> an	aman	amin	ap	aron	
KJ	ant <sup>h</sup> ɔ	amɔ	amin	api	aron	
Mog	altan	aman		ob	orun	

OM	'to bite'	'hundred'	'young'	'to swallow'	'to use'	'to point'
	*čahu	*čahun	*čalahu	*čalki	*čaru	*čiha
Hlh	cuu	cuu	cažu	caž <sup>j</sup> g <sup>j</sup>	car	caa
	zyy	zyy	залуу	залги	зар	зaa
Cha	čuu	čuu	čalu	čeʃk	čar	čaa
Baa	čuu		čalu	čelk	čar	čaa
Bur	zuu	zuun	zalu	zalg <sup>j</sup> ə	zarə	zaa
Kmn	cɔɔ	cɔɔ				
Klm	zu	zun	zalu	zaʃg	zar	za
Dag	čau	čau	čalo	čelk <sup>j</sup>	čar	čaa
ShY	čuu	čuuŋ	čaluu	čalk <sup>h</sup> y	čar	čaa
Mgr	čau	čoŋ	čaliu	čhalke	čari	čaa
San	čau		čalau	čaŋq <sup>h</sup> ei	čaru	čala
Bon	ču	nčoŋ		čalqa	čar	čaa
KJ	čiu	čon	čalu	čalke	čari	čia
Mog	jaŋ		jałau		јору	

OM	'fish'	'year'	'six'	'heart'	'spear'	'to fit'
	*čikasun	*čil	*čirkohan	*čiryken	*čita	*čok <sup>h</sup> i
Hlh	cagəs	čiʃ	curga	curx	čat	cɔx <sup>j</sup>
	загас	жил	зургаа	зүрх	жад	зохь
Cha	čakəs	čil	čurka	čurx	čit	
Baa	čaks	čil		čurx	čet	čœx
Bur	zagəħən	žel	zurgan	zurxən	žadə	zɔx <sup>j</sup> ə
Kmn	cakahu	cil	cürkäa		cita	
Klm	zagṣn	jil	zurgan	zyrk <sup>b</sup> n	jid	zok <sup>h</sup>
Dag	čaus	čil	čirkɔ	čurk <sup>w</sup>		čuk <sup>j</sup>
ShY	čakasyn	čyl	čirkwən	čyrken	čota	čɔky
Mgr	čiqasi	čil	čirqoon	čirke	čitaa	č <sup>h</sup> uku
San	čaqasun	čeŋ	čiŋoŋ	čuqe	čita	
Bon	čalqason	čilu	čirqoŋ	čirke		čoqu
KJ	čikasun	čile	čirkvŋ	čirke	čita	čuku
Mog		jil				

OM	'soft'	'right'	'paper'	'time'	'white'	'snow'
	*čøhelen	*čøp	*čahalsun	*čhak	*čhakahan	*čhasun
Hlh	coožəŋ	cow	c̄haas	c̄bag	c̄agaŋ	c̄as
	зөөлөн	зөв	цаас	цар	цагаан	цас
Cha	čooləŋ		č̄haas	č̄hak	č̄hakaŋ	č̄as
Baa	čoolən	čop	č̄haas	č̄hak	č̄hakan	č̄has
Bur	zoolən	zub	saarhən	sag	sagan	sahən
Kmn			č̄haarhu	c̄bak	c̄hakaan	c̄hahu
Klm	žøolən	zøw	č̄haasn	c̄bag	c̄hagan	c̄hasn
Dag	č̄vulyn	čuu	č̄haas	č̄hek <sup>j</sup>	č̄hikan	č̄pas
ShY	čylen	čøp	č̄haasy	č̄hak	č̄hyskaan	č̄asyn
Mgr	čoolon	čup	č̄haalci	č̄haq	č̄hiqaan	č̄hasi
San	čolien	čo		č̄ha	č̄hiqan	č̄aŋsuŋ
Bon	čularŋ				č̄hixan	č̄ason
KJ	čilɔ			č̄huk <sup>h</sup>	č̄hixɔ	č̄hasun
Mog					č̄agon	č̄osun

OM	'flower'	'soldier'	'ear'	'stone'	'to boil'	'wolf'
	*čhēčhēk	*čherik	*čhik <sup>h</sup> in	*čhiluhun	*čhina	*čhino
Hlh	č̄hic <sup>h</sup> əg	č̄irəg	č̄ix	č̄užu	č̄an	č̄ən
	цэпэр	цэрэг	чих	чулуу	чана	чоно
Cha	čičhək	č̄irək	č̄ix	č̄ulu	č̄an	č̄ən
Baa	č̄hic <sup>h</sup> ək	č̄irək	č̄ix	č̄ulu	č̄an	č̄ən
Bur	sesəg	serəg	šexən	šulun	šanə	šənə
Kmn	č̄hečhēk		č̄hik <sup>h</sup> i	č̄hilčo		č̄həno
Klm	č̄hečh <sup>g</sup>	č̄erg	č̄hik <sup>h</sup> n	č̄holun	č̄an	č̄on
Dag			č̄hik <sup>jh</sup>	č̄holč	šanə	
ShY		č̄heryk	č̄hik <sup>h</sup> yn	č̄lus	č̄na	č̄yna
Mgr		č̄hiraq	č̄hiki		č̄hinaa	
San	č̄hicē		č̄hiqen		č̄hina	
Bon		č̄heruwk	č̄hixan		č̄hina	č̄hina
KJ	č̄hic̄hiu	č̄iriū	č̄hixɔ	č̄holč	č̄hina	
Mog			č̄iqin			č̄ino

OM	'blood'	'devil'	'father'	'door'	'saddle'	'to wear'
	*čʰisun	*čʰitkʰør	*ečʰike	*ehyten	*emehel	*emys
Hlh	cʰus	čʰotb̥gər	ičʰəg	uut	imež	oms
	цус	чөттер	эцэг	үүд	эмээл	өмс
Cha	čus			uut	ymyl	oms
Baa	čʰus	čʰytb̥xər		uut	ymyl	oms
Bur	šuhən	šudxər	esəgə	uudən	emel	umdə
Kmn		cʰitkʰur			emeel	umut
Klm	cʰusn	čʰotb̥kʰr	ecʰkʰ	yydn	emel	øms
Dag	čʰos		včʰək	yut	ymyl	vms
ShY	čʰysyn		čʰke	yten	emel	mvs
Mgr	čʰisi			ute	imel	mosi
San	čʰusuŋ			uitien		misu
Bon	čʰisoŋ			ntanj		muš
KJ	čʰisən			itɔ	mila	mysu
Mog	čisu			oidan	jamal	umus

OM	'this'	'grass'	'learning'	'early'	'ten'	'ashamed'
	*ene	*epesyn	*ertem	*ertʰe	*harpan	*hičʰe
Hlh	in	ows	irtəm	irtʰ	arəw	ičʰ
	энэ	өвс	эрдэм	эрт	арав	иҷ
Cha	vn	ops	vrtəm	vrtʰ	arəp	ičʰ
Baa	vn	ops	vrtəm	vrtʰ	arəp	ičʰ
Bur	enə	ubhən	erdəm	ertʰə	arbən	ešə
Kmn	ene			ertʰe	arpa	
Klm	en	øwsn	erdm	ertʰ	arwn	ičʰ
Dag	vna	yus	vrtəm	vrt	xarpə	xičʰ
ShY	ene	wesyn	vrtem	hyrtʰe	harwan	hčʰe
Mgr	ne	wesi	rtem	še	xaran	ščee
San	ene	osuŋ		etʰie	xaronj	šče
Bon	enuŋ	epsoŋ		ertʰe	harwanj	šče
KJ	env	weisun		etʰe	harɔ	šči
Mog	ena	ebasun				

OM	'bottom'	'blessing'	'forest'	'year'	'bag'	'to tie'
	*hiruhar	*hiryher	*hoi	*hon	*huhuth <sup>h</sup> a	*huja
Hlh	jørəš ëpool	joroš epœøl	ɔi oï	ɔŋ on	ʊut <sup>h</sup> yut	uj yä
Cha		jorol	œœ	ɔŋ	ʊut <sup>h</sup>	uj
Baa	jørəl		œœ	ɔn	ʊut <sup>h</sup>	uj
Bur		jurol	ɔi	ɔn	ʊut <sup>h</sup> ə	ujə
Kmn			ɔi	ɔn		
Klm	joral	jørel	ø	on	uut <sup>h</sup>	uj
Dag		xiryl		xœn		xuja
ShY	hruur	hørøør		hœn	ʊut <sup>h</sup> a	hjaa
Mgr			xii	xon	xuuta	xucaa
San	siro			xoŋ	xuta	xeija
Bon			hii	hoŋ	hta	
KJ	holor		he	hœn	p <sup>h</sup> uta	huja
Mog						

OM	'red'	'ox'	'fox'	'ash'	'to separate'	'goat'
	*hulahan	*hyk <sup>h</sup> er	*hyneken	*hynesyn	*ilka	*imahan
Hlh	ʊlaŋ улаан	uxər үхэр	unəg үнэг	uns	jažəg ялга	jama ямаа
Cha	ulaŋ	uxər	unək үнэк	uns	ilk	jama
Baa	ulan	uxər	unək үнэк	uns	jalk	jama
Bur	ulan	uxər	unəgən үнэгэн	unəhən	ilgə	jaman
Kmn	ulaan	uk <sup>h</sup> er	uncke			imaa
Klm	ulan	yk <sup>h</sup> r	yngn	ymsn	jilg	jaman
Dag	xulan	xuk <sup>w</sup> ər	xun <sup>w</sup> æk <sup>w</sup>	xuns	jalək	ima
ShY	hlaan	hkor	hœneken	henesyn	alka	maan
Mgr	xulaan	xukor	xunike	xunesi	laqaa	imaa
San	xularŋ	xukie	xunieqaŋ	xuniesuŋ	iŋqa	iman
Bon	hulaj	ok <sup>h</sup> or		homsu		jiman
KJ	hulɔ		hunikɔ			imɔ
Mog	ulam	ukar		unasun		

OM	'to laugh'	'to come'	'to eat'	'to go'	'bone'	'big'
	*inehe	*ire	*ite	*japu	*jasun	*jekʰe
Hlh	ine	ir	it	jaw	jas	ix
	иинээ	ир	ид	яв	яс	их
Cha	vŋjy	ir	it	jap	jas	ix
Baa	inŋ	ir	it	jap	jas	jix
Bur	en̥e	jerə	ed̥ə	jabə	jahən	jexə
Kmn		ire	ite	japo		jekʰe
Klm	ine	ir	it	jow	jasn	ikʰ
Dag	xinxt	ir	it	jau	jas	xik
ShY	hnii	ere	ete	jawŋ	jasvn	šikʰe
Mgr	šinee	ire	ite	jau	jasi	ške
San	sinie	ire	itię	jawu	jasuŋ	xukie
Bon	šine	er	nte	jawu	jason	ško
KJ	šine	re	ite	ju	jason	
Mog	ina	ira	ida	jobu	josu-	

OM	'rule'	'ground'	'single'	'pig'	'fire'	'hand'
	*josun	*kačar	*kakčʰa	*kakʰai	*kal	*kar
Hlh	jøs	gacər	ganchʰ	gaxai	gaž	gar
	ěc	газар	ганц	гахай	гал	гар
Cha	jøs	kačər	kancʰ	kaxe	kal	kar
Baa	jøs	kačər	kancʰ	kaxa	kal	kar
Bur	jøhən	gazər	gansa	gaxai	gal	gar
Kmn		kacar		kakʰai	kal	kar
Klm	josn	gazr	ganchʰ	gaxa	gal	gar
Dag	jøs	kačər	kančʰ	kakə	kalj	karj
ShY	jøsɔ	kačar	kʰakčʰa	kakʰai	kal	kar
Mgr		qačar		xqai	qal	qar
San		qača		qʰačei	qʰaj	qʰa
Bon		qačar		qaqui	xal	xar
KJ		kačar		kykai	xar	xar
Mog		gajar			gol	gar

OM	'bitter'	'fault'	'house'	'light'	'beast'
	*kasihun	*kem	*ker	*kerel	*kørehesyn
Hlh	gašuŋ	gim	gir	girəš	goros
	гашуун	гэм	гэр	гэрэл	гөрөөс
Cha	kašuŋ	kym	kyr	kyrəl	koros
Baa	kašuŋ	kym	kyr	kyrl	koros
Bur	gašuŋ	gem	ger	gerəl	gurohən
Kmn			ker		kureehu
Klm	gašun	gem	ger	gerl	gøresn
Dag	kasun	kym	kyr <sup>j</sup>		kurys
ShY	kašuŋ		ker	kerel	kureesyn
Mgr	xašin		ker	kireel	
San	q <sup>b</sup> ušuŋ	kien	kie	kieran	
Bon	qašuŋ	kem	ker		
KJ	kaši-	kan	ker		
Mog	qošun		ger		

OM	'three'	'to shut'	'door'	'scissors'	'to leave'	'warm'
	*kurpan	*k <sup>h</sup> aha	*k <sup>h</sup> ahalka	*k <sup>h</sup> aičhi	*k <sup>h</sup> akačha	*k <sup>h</sup> alahun
Hlh	gurəw	xaa	xaalžəg	xaičh	xagəčh	xažuŋ
	гурав	хaa	хаалжга	хайч	хагац	халуун
Cha	korəp	xaa		xeečh		xalonj
Baa	korəp	xaa	xaalək	xeečh		xalon
Bur	gorbən	xaa	xaalgə	xaišə	xagasa	xalon
Kmn	korpa					khalčon
Klm	gurwn	xa	xaalg	xeečh	xagc <sup>h</sup>	xalon
Dag	k <sup>w</sup> arpə	xaa	xaalək	k <sup>h</sup> aičh		xalon
ShY	korwan	xaa	xaalka	xaičh <sup>y</sup>	xakačha	xaluun
Mgr	qoraan	xaa	xaalqa	xaičhi		xalonj
San	quraŋ	q <sup>h</sup> a		q <sup>h</sup> aičhi	qaqačha	q <sup>h</sup> aluj
Bon	quraŋ	xaa		xiičhi		xolog
KJ	korč	xa		k <sup>h</sup> aičhi		xulč
Mog	qurban					qalon

OM	'together'	'black'	'to return'	'old'	'law'	'when'
	*k <sup>h</sup> amth <sup>u</sup>	*k <sup>h</sup> ara	*k <sup>h</sup> ari	*k <sup>h</sup> aučhin	*k <sup>h</sup> auli	*k <sup>h</sup> ečije
Hlh	xamt <sup>h</sup>	xar	xar <sup>j</sup>	xuučhəŋ	xuučj	xice
	хамт	xap	харъ	хуучин	хуулъ	хэзээ
Cha	xamt <sup>h</sup>	xar	xer <sup>j</sup>	xuučhəŋ		xycy
Baa	xamt <sup>h</sup>	xar	xer	xuučhən	xxyl	xycy
Bur	xamt <sup>h</sup> ə	xarə	xar <sup>j</sup> ə	xuušən	xuušlə	xeze
Kmn	k <sup>h</sup> amt <sup>h</sup> ə	k <sup>h</sup> ara				k <sup>h</sup> ecee
Klm	xamt <sup>h</sup>	xar	xer	xuučhən	xuuʃj	k <sup>h</sup> eze
Dag		xar	xar <sup>j</sup>	k <sup>h</sup> aučhin	k <sup>h</sup> ččl <sup>j</sup>	xycy
ShY	xamty	xara	xary	xuučhyn		k <sup>h</sup> ecee
Mgr	xamti	xara	xari	xaučin		k <sup>h</sup> ičee
San	xant <sup>h</sup> u	q <sup>h</sup> ara	q <sup>h</sup> ari	q <sup>h</sup> uaičhəŋ		kieče
Bon	hamtu	xara	haa	xiičhan		k <sup>h</sup> učhi
KJ		xara	xari	xuaičhɔ		kyče
Mog		qaro	qari-			keja

OM	'wind'	'tongue'	'who'	'how many'	'border'	'to strive'
	*k <sup>h</sup> ei	*k <sup>h</sup> elen	*k <sup>h</sup> en	*k <sup>h</sup> etyn	*k <sup>h</sup> ičahar	*k <sup>h</sup> ičh <sup>y</sup> he
Hlh	xii	xičj	xij	xit	xjaccar	xičhə
	хий	хэл	хэн	хэд	хязгаар	хичээ
Cha	xii	xyl	xyn	xyt		kičh <sup>y</sup>
Baa	xii	xyl	xyn	xyt	xčkar	xych <sup>y</sup>
Bur	x <sup>j</sup> ii	xelən	xen	xedən	x <sup>j</sup> izar	xeše
Kmn		k <sup>h</sup> ele	k <sup>h</sup> en			
Klm	k <sup>h</sup> i	k <sup>h</sup> eln	k <sup>h</sup> en	k <sup>h</sup> edy	k <sup>h</sup> izer	
Dag	xvin	xyl <sup>j</sup>	xyn	xyt	k <sup>h</sup> ičar	k <sup>h</sup> ičh <sup>y</sup>
ShY	k <sup>h</sup> ii	k <sup>h</sup> elen	k <sup>h</sup> en	k <sup>h</sup> eten	kyčaar	
Mgr	k <sup>h</sup> ii	k <sup>h</sup> ile	k <sup>h</sup> en	k <sup>h</sup> iti	kičaar	
San	k <sup>h</sup> ai	k <sup>h</sup> ielien	k <sup>h</sup> ien	kietuŋ	quča	
Bon	k <sup>h</sup> ii	k <sup>h</sup> elan	k <sup>h</sup> an	k <sup>h</sup> uton		
KJ	k <sup>h</sup> e	k <sup>h</sup> ilio	k <sup>h</sup> ɔ	kutɔ		
Mog	kei	kelan	ken	kedu		

OM	'easy'	'nail'	'China'	'empty'	'back'	'two'
	*k <sup>h</sup> ilpar	*k <sup>h</sup> imusun	*k <sup>h</sup> it <sup>h</sup> at	*k <sup>h</sup> ohasun	*k <sup>h</sup> oina	*k <sup>h</sup> ojar
Hlh	x <sup>h</sup> ałpər	xums	x <sup>h</sup> at <sup>h</sup> ət	xəcsəŋ	xɔin	xɔjər
	хялбар	хумс	Хятад	хоосон	хойно	хоёр
Cha	xilpər	xums	k <sup>h</sup> it <sup>h</sup> at	xəcsəŋ	xəœn	xɔjər
Baa	xelpər	xoməs		xəcsəŋ	xəœn	xɔjər
Bur	x <sup>h</sup> ilbər	x <sup>h</sup> umhən		xəchən	xɔinə	xɔjər
Kmn		k <sup>h</sup> imuhu	k <sup>h</sup> it <sup>h</sup> at			k <sup>h</sup> oir
Klm	k <sup>h</sup> ilwyr	xumsn	k <sup>h</sup> it <sup>h</sup> d	xoosn	xøøn	xojr
Dag		k <sup>h</sup> imč <sup>h</sup>		xəcs <sup>w</sup> ən	x <sup>w</sup> ainə	xɔir
ShY		xymysyn	k <sup>h</sup> ut <sup>h</sup> at	xusyŋ	xɔinč	kuor
Mgr	č <sup>h</sup> irwal-	č <sup>h</sup> imsi	č <sup>h</sup> itar	xoosin	xoino	qoor
San	qeīwa	qumusuŋ	q <sup>h</sup> utei	q <sup>h</sup> usuŋ	q <sup>h</sup> uina	qua
Bon		qomsoŋ	hti		xiina	quar
KJ		kemesun	xt <sup>h</sup> e		kuaina	koar
Mog				qosun	qauna	qijar

OM	'far'	'sheep'	'navel'	'cold'	'blue'	'foot'
	*k <sup>h</sup> ola	*k <sup>h</sup> onin	*k <sup>h</sup> øisyn	*k <sup>h</sup> øit <sup>h</sup> en	*k <sup>h</sup> øk <sup>h</sup> e	*k <sup>h</sup> øl
Hlh	xɔł	xɔn <sup>j</sup>	xuis	xuit <sup>h</sup> əŋ	xox	xɔł
	хол	хонь	хүйс	хүйтэн	хөх	хөл
Cha	xɔł	xɔn <sup>j</sup>	xiis	xiit <sup>h</sup> əŋ	kox	xol
Baa	xɔł	xɔn	xyys	xyyt <sup>h</sup> n	xox	xol
Bur	xɔłə	xɔn <sup>j</sup> ən	xuihən	xuit <sup>h</sup> ən	xuxə	xul
Kmn		k <sup>h</sup> oni	k <sup>h</sup> uihu		k <sup>h</sup> uk <sup>h</sup> u	k <sup>h</sup> ul
Klm	xol	xøn	k <sup>h</sup> iisn	k <sup>h</sup> iit <sup>h</sup> n	k <sup>h</sup> øk <sup>h</sup>	k <sup>h</sup> øl
Dag	xɔł	xɔn <sup>j</sup>	k <sup>h</sup> uis	k <sup>h</sup> uit <sup>wh</sup> ən	k <sup>h</sup> uk <sup>wh</sup>	k <sup>h</sup> ulj
ShY	xɔł	xɔcny	k <sup>h</sup> yysyn	k <sup>h</sup> yit <sup>h</sup> en	hk <sup>h</sup> ø	k <sup>h</sup> øl
Mgr	xolo	xoni	k <sup>h</sup> uici	k <sup>h</sup> uiten	k <sup>h</sup> uko	k <sup>h</sup> ol
San	qolo	qoni	k <sup>h</sup> uaisuŋ	k <sup>h</sup> uit <sup>h</sup> ien	k <sup>h</sup> ukie	k <sup>h</sup> uan
Bon	xolo	qoni	k <sup>h</sup> iiisoŋ	k <sup>h</sup> it <sup>h</sup> aŋ	k <sup>h</sup> uko	k <sup>h</sup> ol
KJ	kolo	xoni		k <sup>h</sup> uit <sup>h</sup> ɔ	k <sup>h</sup> uk <sup>h</sup> u	k <sup>h</sup> or
Mog	qolo	qonin			koka	kol

OM	'sweat'	'light'	'to bark'	'sheath'	'thief'	'destiny'
	*k <sup>h</sup> ølesyn	*k <sup>h</sup> øŋken	*k <sup>h</sup> učha	*k <sup>h</sup> ui	*k <sup>h</sup> ulakai	*k <sup>h</sup> upi
Hlh	xoʃs	xoŋgəŋ	xuč <sup>h</sup>	xuī	xužgai	xuw <sup>j</sup>
	xəlc	xəŋtən	xuč	xuy	xulgai	xuvb
Cha	xols	xoŋkəŋ		xyi	xulkε	xyp <sup>j</sup>
Baa	xols	xoŋŋən	xuč <sup>h</sup>	xyy	xulkε	xœp
Bur	xulhən	xungən	xusə	xuī	xulgai	xub <sup>j</sup> ə
Kmn						
Klm	k <sup>h</sup> ølsn		xuč <sup>h</sup>	xy	xulxa	xyw
Dag	xuls	xunkyn	k <sup>h</sup> ɔč <sup>h</sup>		xʷalək	xɔp <sup>j</sup>
ShY	k <sup>h</sup> ulesvn	k <sup>h</sup> øŋken	k <sup>h</sup> učha	xuī	xulvkai-	xuw
Mgr	k <sup>h</sup> onorsi	k <sup>h</sup> onkon	xoča	xoi	xolqai	
San	k <sup>h</sup> oliesuŋ	koŋkien	q <sup>h</sup> uča		quqi	
Bon	k <sup>h</sup> olsoŋ	k <sup>h</sup> øŋk <sup>h</sup> anj	hča		qolqui	
KJ	k <sup>h</sup> olesu	kuŋkɔ	k <sup>h</sup> učha		kolkai	
Mog					qolagei	

OM	'finger'	'heavy'	'to reach'	'son-in-law'	'forehead'	'very'
	*k <sup>h</sup> uruhun	*k <sup>h</sup> ynty	*k <sup>h</sup> yr	*k <sup>h</sup> yreken	*maŋlai	*masi
Hlh	xuru	xunt	xur	xurgəŋ	magnai	maš
	xypyy	xүнд	xyp	xүргэн	магнай	маш
Cha	xuru	xunt	xur	xurkəŋ	makne	
Baa	xuru	xunt	xur	xurkən	meŋne	maš
Bur	xurgən	xundə	xurə	xur <sup>j</sup> gən	magnai	mašə
Kmn	k <sup>h</sup> uruu		k <sup>h</sup> ur	k <sup>h</sup> uriken		
Klm	xurgn	k <sup>h</sup> ynd	k <sup>h</sup> yr	k <sup>h</sup> yrgn	maŋna	maš
Dag	xɔrɔ	xunt	k <sup>h</sup> ur	xurkʷən	mank <sup>j</sup> əl	
ShY	xuruun	k <sup>h</sup> uŋtʰy	k <sup>h</sup> ur	k <sup>h</sup> urken	maŋlii	
Mgr	xori	k <sup>h</sup> untun	k <sup>h</sup> uri	k <sup>h</sup> urkeen	maŋlii	
San	quru	kuntu	k <sup>h</sup> uru	q <sup>h</sup> uqoŋ	maŋleu	
Bon	qurui	k <sup>h</sup> untʰw	k <sup>h</sup> ur	k <sup>h</sup> urqaŋ		
KJ	kuro	kuntu	k <sup>h</sup> ur	k <sup>h</sup> urkɔ		
Mog	qurun	kundu	kur			

OM	'to know'	'meat'	'thousand'	'snake'	'horse'	'horses'
	*mete	*mik <sup>h</sup> an	*miŋk <sup>h</sup> an	*mokai	*morin	*morit
Hlh	mit	max	m <sup>j</sup> aŋg	məgoi	mər <sup>j</sup>	mər <sup>j</sup> t
	мэд	мах	мянга	могой	морь	морьд
Cha	myt	max	mɪŋk	məkəe	mər <sup>j</sup>	mər <sup>j</sup> ət
Baa	myt	max	məŋŋi	məkə	mər	
Bur	medə	m <sup>j</sup> axən	m <sup>j</sup> angən	məgoi	mər <sup>j</sup> ən	mər <sup>j</sup> əd
Kmn	mete	mik <sup>h</sup> a	miŋka		məri	
Klm	med	maxn	miŋŋn	moga	mərn	mərd
Dag	myt	m <sup>j</sup> ak	m <sup>j</sup> ankə	mək <sup>w</sup>	mər <sup>j</sup>	
ShY	mete	mak <sup>h</sup> an	m <sup>j</sup> ŋukan	məkəi	məry	
Mgr	mute	maxa	məŋxen	moqoi	mori	
San	metie	miqa		moqeи	mori	
Bon	metu	maqa		moqui	moru	
KJ	mete	maka		məkəai	məri	
Mog	meda	mjeqan		mogoi	morin	

OM	'tree'	'ice'	'path'	'to play'	'eight'	'leaf'
	*motun	*mølsyn	*mør	*nahat	*naiman	*napč <sup>h</sup> in
Hlh	möt	mos	mor	naat	naim	nawč <sup>h</sup>
	мод	мес	мөр	наад	найм	навч
Cha	möt	mos	mor	naat	neem	nepc <sup>h</sup>
Baa	möt	mos	mor	naat	neem	nepc <sup>h</sup>
Bur	mödən	mul <sup>j</sup> hən	mur	naadə	naimən	nabšə
Kmn	mötə	mulihu		naat	naima	napčhi
Klm	modn	møsn	mør	naad	neemn	
Dag	möt	mvis		naat	naim	larč <sup>h</sup>
ShY	mootyn	møsyn	mør	naat	neiman	lapč <sup>h</sup> yk
Mgr	mooti	molsi	moor	naati	naiman	lapči
San	mut <sup>h</sup> uŋ	mansiŋ	mo	natu	neimaj	lač <sup>h</sup> eŋ
Bon	mot <sup>h</sup> oŋ	melsuŋ	mor	naat	nimaŋ	lapč <sup>h</sup> aj
KJ	murt <sup>h</sup> un	morsun	mor	nate	neimo	laščɔ
Mog	modu		mur	notu		

OM	'fine'	'age'	'to open'	'to weave'	'sheepskin'	'name'
	*narin	*nasun	*nehe	*nek <sup>h</sup> e	*nek <sup>h</sup> ei	*nere
Hlh	nar <sup>j</sup> iŋ	nas	nee	nix	nixi	nir
	нарийн	нас	нээ	нэх	нэхий	нэр
Cha	neriŋ	nas	nvv	nvx		nvr
Baa	nerin	nas	nvv	nvx		nvr
Bur	nar <sup>j</sup> ən	nahən	nee	nexə	nex <sup>j</sup> ə	nerə
Kmn	narin	nahu	nee			nere
Klm	nern	nasn	ne	nek <sup>h</sup>	nek <sup>h</sup> ɛ	nern
Dag	nar <sup>j</sup> ən	nas	nvv			nvr
ShY	naryn	nasvn	nii	nek <sup>h</sup> e	nvk <sup>h</sup> vv	nere
Mgr	narin	nase	nee	nik <sup>h</sup> i	nik <sup>h</sup> ii	nire
San	naruŋ	nasuŋ	nie	nok <sup>h</sup> ie	nek <sup>h</sup> i	
Bon	naaraŋ	nasu	nee			neru
KJ	naro	nasun	ne		nek <sup>h</sup> e	nere
Mog	norin			neka		nera

OM	'naked'	'to hide'	'baby'	'thin'	'spine'	'to fly'
	*nič <sup>h</sup> ykyn	*nihu	*nilk <sup>h</sup> a	*nimken	*niruhun	*nis
Hlh	nuc <sup>h</sup> gəŋ	nuu	n <sup>j</sup> alx	nimgəŋ	nuru	nis
	нуцгэн	нуу	нялх	нимгэн	нурүү	нис
Cha	nuč <sup>h</sup> kən	nuu	nilx	niŋkəŋ	nuru	nis
Baa	nuč <sup>h</sup> kən	nuu			nuru	nis
Bur	n <sup>j</sup> usegen	n <sup>j</sup> uu	n <sup>j</sup> ilxə	n <sup>j</sup> imgən	n <sup>j</sup> urgən	n <sup>j</sup> iidə
Kmn		niu				neit
Klm	nyc <sup>h</sup> k <sup>h</sup> n	nu	nilx	nimgn	nurgn	nis
Dag		ccu	n <sup>j</sup> alk <sup>h</sup>	ninkyn	nirɔ	
ShY		nuu		neŋkwen	nuruun	hɔnys
Mgr		niu		nenken	nuri	nesi
San	muč <sup>h</sup> uquŋ	niu		niŋk <sup>h</sup> ien	nuruŋ	misu
Bon	nišqaŋ	nuu		niŋqan		muš
KJ				niŋko	nuru	mysu
Mog		niku				

OM	'eye'	'sleep'	'green'	'dog'	'friend'	'near'
	*nityn	*noir	*nokahan	*nok <sup>hai</sup>	*nök <sup>her</sup>	*oira
Hlh	nut	nöir	nögöŋ	nöxöi	noxər	öir
	нүд	нойр	ногоон	нохой	нөхөр	оир
Cha	nut	nœœr	nököŋ	nöxa	noxər	œœr
Baa	nut	nœœr	nökön	nöxa	noxər	œœr
Bur	n <sup>j</sup> udən	nöir	nögöŋ	nöxöi	nuxər	öirə
Kmn	nitu			nök <sup>h</sup> öi	nuk <sup>h</sup> ur	öiro
Klm	nydn	nør	nogan	noxa	nök <sup>h</sup> r	øør
Dag	nit	nöir	nuwa	nök <sup>w</sup>	nuk <sup>w</sup> ər	wair
ShY	nutun	nuur	nökön	nök <sup>h</sup> öi	nök <sup>h</sup> ør	öiro
Mgr	nuti	noor	nuqoon	noxoi	nok <sup>h</sup> or	
San	nutuŋ	no	noqoŋ	noqeи	nok <sup>h</sup> ie	uira
Bon	notoŋ	nor	noquŋ	noqui	nok <sup>h</sup> or	
KJ	nutu	nur	nökön	nukuai	nok <sup>h</sup> u	
Mog	nudun	noir		noqai		oira

OM	'to find'	'many'	'to enter'	'to give'	'girl'	'egg'
	*ol	*olan	*ora	*øk	*øk <sup>hin</sup>	*ønteken
Hlh	əł	əłəŋ	ər	og	əx <sup>h</sup> əŋ	ontəg
	ol	olon	op	ər	oxin	əndəg
Cha	əł	əłəŋ	ər	ok		ontək
Baa	əł	əłəŋ	ər	ok		ontək
Bur	əłə	əłəŋ	ərə	ugə	ux <sup>h</sup> ən	undəgən
Kmn	əł	əłəŋ	ərə	uk		untuku
Klm	ol	oln	or	øg	ok <sup>h</sup> n	øndgn
Dag	əł	walən	war	uk <sup>wh</sup>	ujən	vnt <sup>w</sup> ək <sup>w</sup>
ShY	əɔl	əłəŋ	ərə	ok	hk <sup>h</sup> on	
Mgr	uli	ulon	uro	uqo	ščun	ntike
San	olu	oloŋ	oro	oki	ot <sup>h</sup> in	enteqi
Bon	ol	oloŋ	or	ox	ok <sup>h</sup> uŋ	emtuuke
KJ		vlu	oru	uk		nteke
Mog	ol		oru	og	ukin	ondagan

OM	'colour'	'to go down'	'rich'	'to hold'	'tiger'	'also'
	*øŋke	*pahu	*pajan	*pari	*pars	*pasa
Hlh	oŋg	puu	pañəŋ	par <sup>j</sup>	par	pas
	əŋrə	buu	bajən	bär <sup>j</sup>	bär	bac
Cha	oŋk	puu	pañəŋ	per <sup>j</sup>	par	pas
Baa	oŋ	puu	pañən	per	par	pas
Bur	ungə	buu	bajən	bar <sup>jə</sup>	bar	bahə
Kmn	ujke	pɔɔ				
Klm	øŋg	bu	bajn	ber	bars	bas
Dag	unk <sup>w</sup>	pɔɔ	pajən	par <sup>j</sup>		pas
ShY	øŋkø	puu	pjan	par	parvs	p <sup>h</sup> ysa
Mgr	ŋko	pau	pajaan	pari	pas	
San	oŋkie	pau	pajəŋ	pari	pasu	p <sup>h</sup> eſe
Bon		puu	pajəŋ	war	pasu	sa
KJ		pʊ	pajɔ	pari	pasu	
Mog				bari		bos

OM	'firm'	'body'	'bride'	'to write'	'letter'	'to rise'
	*pat <sup>h</sup> u	*peje	*peri	*pič <sup>h</sup> i	*pič <sup>h</sup> ik	*pos
Hlh	pat <sup>h</sup>	riŋ	pir	pič <sup>h</sup>	pič <sup>h</sup> əg	pəs
	bat	bie	bær	bich	bichig	boc
Cha		pyj	pyr	pič <sup>h</sup>	pič <sup>h</sup> ək	pəs
Baa	pat <sup>h</sup>	pyj	pyr	pič <sup>h</sup>	pič <sup>h</sup> ək	pəs
Bur	bat <sup>h</sup> ə	bejə	ber <sup>jə</sup>	bešə	bešəg	bədə
Kmn			peri	pic <sup>h</sup> i	pic <sup>h</sup> ik	pət
Klm	bat <sup>h</sup>	bij	ber	bič <sup>h</sup>	bič <sup>h</sup> g	bos
Dag		pyj	pyr <sup>j</sup>			pəs
ShY	pat <sup>h</sup>	pij	peerv	p <sup>h</sup> yč <sup>h</sup> y	p <sup>h</sup> yč <sup>h</sup> yk	p <sup>h</sup> əs
Mgr	p <sup>h</sup> ati	pee	peeri		p <sup>h</sup> učik	posi
San	p <sup>h</sup> utu	peje	pieri	p <sup>h</sup> iči		posu
Bon	pat <sup>h</sup> u		weru	p <sup>h</sup> wičhi	p <sup>h</sup> wičhi	oš
KJ		pe	pere	p <sup>h</sup> yčhi	p <sup>h</sup> yčhiu	pəsu
Mog			beiri	biči		bos

	'kidney'	'louse'	'spring'	'belt'	'to milk'	'to sit'
OM	*pøhere	*pøhesyn	*pulak	*pyse	*saha	*sahu
Hlh	poor	poos	pʊʃəg	pus	saa	sou
	бөөр	бөөс	бүлэг	бүс	caa	cyy
Cha	poor	poos	pʊlək		saa	suu
Baa	poor	poos	pələk		saa	suu
Bur	boorə	boohən	buləg	behə	haa	huu
Kmn	peere		pulak	pehe		hɔɔ
Klm	bøør	bøøsn	bulg	bys	sa	su
Dag		puus	pular	pys	saa	sau
ShY	p <sup>h</sup> ytre	pvisyn	polak	p <sup>h</sup> ysyi	saa	suu
Mgr	pooro	poosi	pulaq	p <sup>h</sup> usee	saa	sau
San	poro	posuŋ	pula	p <sup>h</sup> isie	sa	sau
Bon	pooru	poosooŋ	pulaq	se	saa	suu
KJ	pore	posun		p <sup>h</sup> use	sa	su
Mog		busu			so	sou

	'base'	'good'	'beard'	'to protect'	'comb'	'moon'
OM	*sahurin	*sain	*sak <sup>h</sup> al	*sak <sup>h</sup> i	*sam	*sara
Hlh	suur <sup>j</sup>	saiŋ	saxəg	sax <sup>j</sup>	sam	sar
	суурь	сайн	caxal	caxъ	cam	cap
Cha	syir <sup>j</sup>	seeŋ	saxəl		sam	sar
Baa	syyr	seen	saxəl	sex	sam	sar
Bur	hooř <sup>j</sup>	hain	haxəl	hax <sup>j</sup> ə	ham	harə
Kmn		hain	hak <sup>h</sup> al			hara
Klm	syyr	sen	saxl	sek <sup>h</sup>	sam	sar
Dag		sain	sakəl	sak <sup>j</sup>		sar
ShY		sein	sakal	saaky	sam	sara
Mgr		sain	sqal	ski	sam	sara
San		sei-	saqan	saqi	saŋ	sara
Bon		saŋ	saxal	saaqa	sam	sara
KJ		seini		saxi	san	sara
Mog		soin	sagal			

OM	'tail'	'mind'	'to piss'	'new'	'falcon'	'bird'
	*sehyl	*setkʰil	*sihe	*sini	*sɪŋkʰor	*sipahun
Hlh	suuł̥	sitʰgəł̥	šee	šin	šɔŋxər	šuwu
	сүүл	сэтгэл	шээ	шинэ	шонхор	шувьү
Cha	suul		šyy	šin		šupu
Baa	suul	sytʰxəł	šyy	šyn		šupu
Bur	huul	sedjxəł	šee	šenə	šɔnxər	šubun
Kmn	heel			hine		hipčč
Klm	syl	sedkʰil	še	šin	šoŋxr	šowun
Dag	sýul̥		svy	šinkʰən		šəko
ShY	syyl	setʰkył	šii	švny		šuvn
Mgr	suul	skil	šee	šini		šau
San	sien		še	šini		
Bon	sel	swuktʰe-	še	šinu		
KJ	sar		še	šini		
Mog			sei			

OM	'mud'	'yellow'	'table'	'tooth'	'arrow'	'to learn'
	*siper	*sira	*sirihe	*sityn	*sumun	*sur
Hlh	šawər	šar	šire	šut	som	sor
	шавар	шар	шире	шүд	сум	cyp
Cha	šapər	šar	širy	šut	som	sor
Baa	šapər	šar	širy	šyt	som	sor
Bur	šabər	šarə	šere	šudən	həmən	horə
Kmn	hipar	hira	hiree	hitu		hor
Klm	šawr	šar	širə	šydn	sumn	sur
Dag	šaur	šar	širy	šit	som	sor
ShY	šwar	šra	šere	štvn	svyvn	sor
Mgr	šawar	šira	širee	šti	sumu	suri
San	šuwa	šira	šire	šituŋ	sumu	suru
Bon	šiwar	šira		štoŋ	smo	sur
KJ	šiwar	šira	šire	šituŋ	sumu	sor
Mog		širo		sudun		

OM	'axe'	'temple'	'sore'	'sound'	'to press'	'gown'
	*syk <sup>h</sup> e	*symē	*tahari	*tahan	*taru	*tehel
Hlh	sux	sum	taar <sup>j</sup>	tuu	tar	tee <sup>j</sup>
	cyx	cym	daarp̥	dyy	dar	deel
Cha	sux	sum	teer	tuu	tar	tayl
Baa	sox	som	teer	tuu	tar	
Bur	huxə	humə	daar <sup>j</sup> ə	duun	darə	degəl
Kmn	huk <sup>h</sup> e			tɔo	taru	tekel
Klm	syk <sup>h</sup>	sym	deer	dun	dar	dewl
Dag	suk <sup>w</sup>	sum	taar	tau	tar	tayl <sup>j</sup>
ShY	suk <sup>h</sup> e		taary	tuun	tary	tiil
Mgr	suko	smeen		tau	taari	teel
San	sukie			toŋ	taru	tien
Bon	ške			toŋ	tar	
KJ	suku			toŋ	tari	
Mog				daun	dar	

OM	'above'	'rope'	'brother'	'lame'	'seven'	'inside'
	*tehere	*tehesyn	*tehy	*tok <sup>h</sup> alan	*tolahan	*tot <sup>h</sup> ara
Hlh	teer	tees	tuu	təgžəŋ	tčž	tɔt <sup>h</sup> ər
	дээр	дээс	дүү	доголон	долоо	дотор
Cha	tayr	tays	tuu	təkləŋ	tčlə	tɔt <sup>h</sup> ər
Baa	tayr	tays	tuu	təkləŋ	tčlə	tɔt <sup>h</sup> ər
Bur	deerə	deehən	duu	đcxələn	đelən	đɔt <sup>h</sup> ər
Kmn	teere		tee		tčlə	
Klm	deer	deesn	dy	doglŋ	dolan	dot <sup>h</sup> r
Dag	tayr	tays	tyu	təkʷlʷən	tčlə	tʷatʷhər
ShY	tiire	tiisyn	tyy	təkələŋ	tčlən	ht <sup>h</sup> ər
Mgr	tire	teesi	tiu	toqlŋ	toloon	thutor
San	tiere	tiesun	tiau	toqloŋ	toloŋ	sutoro
Bon	tiiru		tu	toqlŋ	toloŋ	
KJ	tere	teisun	tewu	tuklu-	tčlə	
Mog	dera	deisun				

OM	'forty'	'four'	'middle'	'full'	'to offer'	'hen'
	*tøč <sup>h</sup> in	*tørpen	*tumta	*tyhyreŋ	*t <sup>h</sup> ak <sup>hi</sup>	*t <sup>h</sup> ak <sup>h</sup> ija
Hlh	toč <sup>h</sup>	torəw	tont	tuurəŋ	t <sup>h</sup> ax <sup>j</sup>	t <sup>h</sup> ax <sup>j</sup> a
	дөч	дөрөв	дунд	дүүрэн	тахъ	тахиа
Cha	toč <sup>h</sup>	torəp	tont	tuurən		tex <sup>j</sup> a
Baa	toč <sup>h</sup>	torəp	tont	tuurəŋ	t <sup>h</sup> ex	t <sup>h</sup> exa
Bur	dušən	durbən	donda	duurən	t <sup>h</sup> ax <sup>j</sup> ə	t <sup>h</sup> ax <sup>j</sup> a
Kmn	tuc <sup>h</sup> i	turpe	tumta			t <sup>h</sup> ak <sup>h</sup> ie
Klm	døč <sup>h</sup> n	dørwn	dund	dyyrŋ	t <sup>h</sup> ek <sup>h</sup>	t <sup>h</sup> ak <sup>h</sup> a
Dag	tuč <sup>h</sup>	turp <sup>w</sup>	t <sup>w</sup> ant	tuur-	t <sup>h</sup> ak <sup>j</sup> h	tyki
ShY	tøč <sup>h</sup> yn	tørwen	tonta	tyreŋ	tak <sup>h</sup> y	tak <sup>h</sup> a
Mgr	t <sup>h</sup> ičin	teeren	tunta	tiuri-		t <sup>h</sup> iqau
San		tieroy	tunta	turan		t <sup>h</sup> uqa
Bon		teraj		tur-		t <sup>h</sup> uxa
KJ		tero	tonta	tur-		t <sup>h</sup> axa
Mog		durbon		dur-		

OM	'to recognize'	'fifty'	'five'	'to pull'	'hare'	'camel'
	*t <sup>h</sup> ani	*t <sup>h</sup> apin	*t <sup>h</sup> apun	*t <sup>h</sup> at <sup>h</sup> a	*t <sup>h</sup> aulai	*t <sup>h</sup> emehen
Hlh	t <sup>h</sup> an <sup>j</sup>	t <sup>h</sup> aw <sup>j</sup>	t <sup>h</sup> aw	t <sup>h</sup> at <sup>h</sup>	t <sup>h</sup> uužai	t <sup>h</sup> ime
	тань	тавъ	тав	тат	тууладай	тэмээ
Cha	t <sup>h</sup> en <sup>j</sup>	t <sup>h</sup> ep <sup>j</sup>	t <sup>h</sup> ap	tat <sup>h</sup>	t <sup>h</sup> oole	t <sup>h</sup> ymy
Baa	t <sup>h</sup> en	t <sup>h</sup> ep	t <sup>h</sup> ap	t <sup>h</sup> at <sup>h</sup>	t <sup>h</sup> oole	t <sup>h</sup> omo
Bur	t <sup>h</sup> an <sup>j</sup> ə	t <sup>h</sup> ab <sup>j</sup> ən	t <sup>h</sup> abən	t <sup>h</sup> at <sup>h</sup> ə	t <sup>h</sup> oolai	t <sup>h</sup> emen
Kmn		t <sup>h</sup> api	t <sup>h</sup> apo		t <sup>h</sup> ɔɔlai	t <sup>h</sup> emee
Klm	t <sup>h</sup> an <sup>j</sup>	t <sup>h</sup> ewn	t <sup>h</sup> awn	t <sup>h</sup> at <sup>h</sup>	t <sup>h</sup> uula	t <sup>h</sup> emen
Dag	t <sup>h</sup> an <sup>j</sup>	t <sup>h</sup> ap <sup>j</sup>	t <sup>h</sup> awə	t <sup>h</sup> at <sup>h</sup>	t <sup>h</sup> aulj	t <sup>h</sup> ymy
ShY	t <sup>h</sup> any	t <sup>h</sup> awyn	t <sup>h</sup> awyn	ht <sup>h</sup> a	t <sup>h</sup> oolii	t <sup>h</sup> emeen
Mgr	t <sup>h</sup> ani	t <sup>h</sup> ajin	t <sup>h</sup> awun	t <sup>h</sup> ita	t <sup>h</sup> oolii	t <sup>h</sup> imeen
San	t <sup>h</sup> ani		t <sup>h</sup> awuŋ	sta	t <sup>h</sup> aulei	
Bon	t <sup>h</sup> ani		t <sup>h</sup> awoŋ	šta	t <sup>h</sup> oli	
KJ	t <sup>h</sup> ani		t <sup>h</sup> awun	st <sup>h</sup> a	t <sup>h</sup> oli	
Mog	toni		taban	tata		temon

OM	'iron'	'number'	'kettle'	'fat'	'to drink'	'to cry'
	*tʰemyr	*tʰohan	*tʰokahan	*tʰosun	*uhu	*uila
Hlh	tʰomər	tʰɔɔ	tʰɔɔɔ	tʰɔs	uu	vilɔ̄
	төмөр	тоо	тогoo	тоc	yy	йл
Cha	tʰomər	tʰɔɔ	tʰɔkɔ	tɔs	uu	χil
Baa	tʰomər	tʰɔɔ		tʰɔs	uu	χyil
Bur	tʰumər	tʰɔɔn	tʰɔgɔn	tʰɔhən	uu	vilə
Kmn	tʰumur	tʰɔɔ		tʰɔhɔ	uu	
Klm	tʰømr	tʰo		tʰosn	u	uulj
Dag		tʰɔɔ	tʰuwa	tʰɔs	ɔɔ	wail
ShY	tʰemər	tʰʊsn	tʰɔkɔɔn	tʰʊusyn	uu	yyla
Mgr	tʰimur	tʰoo	tʰuqoo	tʰoosi	uu	ulaa
San	tʰiemu	tʰeu-	tʰuqoŋ	tʰosuŋ	u	uila
Bon	tʰemur	tʰoo-	tʰawxoŋ	tʰosoŋ	uu	laa
KJ	čʰimo	tʰo-	tʰuxuŋ	tʰosuŋ		ila
Mog				tosun		uila

OM	'to wash'	'to forget'	'to sleep'	'to ride'	'to summon'	'long'
	*ukija	*umartʰa	*untʰa	*unu	*uri	*urtʰu
Hlh	uga	martʰ	untʰ	un	orj	ortʰ
	yraa	март	үнт	уна	урь	урт
Cha	uka	martʰ	untʰ	un		ortʰ
Baa	uka	martʰ	untʰ	un	yr	ortʰ
Bur	uga	martʰə	untʰə	unə	orjə	utʰə
Kmn	ukaa	martʰa	untʰa			
Klm	uga	martʰ	untʰ	un	yr	utʰ
Dag	waa	martʰ	wantʰ	ɔnʷə	orj	ɔrtʰ
ShY	ukwaa	martʰa	nta	hɔnɔ		hortʰu
Mgr	ŋqoa	muštaa	ntʰaa	xuni	uri	štur
San	waqa	matʰa		unu	uru	xutu
Bon	waqa	martʰa	tʰaa	honu	ur	štur
KJ	ukoa	martʰa		one	ori	štu
Mog	uga	morta		uno		urtu

OM	'water'	'to see'	'point'	'deed'	'joint'	'word'
	*usun	*yče	*yčyhyr	*yile	*yje	*yke
Hlh	ʊs	uc	ucur	uiž	uj	ug
	yc	Y <sup>3</sup>	Y <sup>3</sup> YYp	ŷjl	ye	ŷr
Cha	ʊs	uč	učur	yil	uj	uk
Baa	ʊs	uč	učur	yyl	uj	uk
Bur	ʊhən	uzə	uzur	uilə	ujə	ugə
Kmn	uhu	uce				
Klm	usn	yz	yzyr	yyl	yj	yg
Dag	ɔs	uč	xučur	wyil	wyj	
ShY	k <sup>h</sup> usun	eče	čyyr	ule	jwee	uke
Mgr	scu	uča	učuur	ule	uje	uko
San	usu	uče	uču	uile	uje	
Bon	s <sup>h</sup> u	uči	učir	wilu		
KJ	su	uče	učir	ile		
Mog	usun	uјa				

OM	'to die'	'cow'	'high'	'day'
	*yk <sup>h</sup> y	*ynijen	*yntyr	*ytyr
Hlh	ux	une	ontər	otər
	yx	үнээ	өндөр	өдөр
Cha	ux	un <sup>j</sup> y	ontər	otər
Baa	ux	une	ontər	otər
Bur	uxə	un <sup>j</sup> en	undər	udər
Kmn		unie	untur	utur
Klm	yk <sup>h</sup>	una	øndr	ødr
Dag	uk <sup>w</sup>	un <sup>j</sup> e	xunt <sup>w</sup> ər	ut <sup>w</sup> ər
ShY	hk <sup>h</sup> u	niin	oŋtor	otor
Mgr	xuku	unee	untur	utur
San	xuku		untu	utu
Bon	hku	unaŋ	untur	utur
KJ	ku	unič	untyr	utyr
Mog	uku	uinan		udur

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## DEVELOPMENT OF THE MODERN MONGOLIC LANGUAGES<sup>1</sup>

This chapter describes the development from Old Mongolian to the Modern Mongolic languages, in particular Halkh Mongolian. The standard works by Ramstedt (1902; 1957), Vladimirov (1929), Sanžeev (1953), Poppe (1955; 1960a), Yu Shichang (1983), Tömörtoogoo (1992), and Darbeeva (1996) are relevant for the whole chapter, and we will not refer to them specifically in each section. More specific literature is referred to in the relevant places. In order to avoid excessive repetition, examples which illustrate the normal developments in each language are given by referring to the comparative vocabulary in section 9.13.

### 10.1 THE MONGOLIC VOWEL SHIFTS<sup>2</sup>

The Old Mongolian seven-vowel system has changed considerably in all modern Mongolic languages except Oirad. Three phonological processes, velarization, pharyngealization, and palatalization, account for most changes. Vowel palatalization (umlauting) is conditioned by a following *i*. In some languages, for example, Halkh Mongolian, it has only had an effect on the phonetic surface, but in Eastern Mongolian and in Oirad it has restructured the vowel system. Vowel palatalization is treated in section 10.11.2.

In contrast to palatalization, velarization and pharyngealization are not conditioned by the phonological environment, and have no obvious internal motivation. These processes, which have affected all modern Mongolic languages except Oirad, are treated in this section, as the two parts of the Mongolic vowel shift. In order to describe the vowel shifts we will use the features [palatal], [velar], [pharyngeal], [open], and [round] ([P], [V], [F], [O], [R]) introduced in section 5.1.

Velarization is the process of adding the feature [velar]. This converts front vowels to back vowels:

- (1) y [PR] → u [PVR]
- e [PO] → v [VO]
- ø [POR] → o [VOR]

<sup>1</sup> For notes and sources, see App. J, 10, p. 228.

<sup>2</sup> For notes and sources, see App. J, 10.1, p. 228.

There is a general rule which excludes the combination \*[PVO], replacing it with [VO], so if the feature [velar] is added to an open vowel with the feature [palatal], this feature is deleted, as in the two last cases in (1).

Pharyngealization adds the feature [pharyngeal]:

- (2)  $i$  [P]  $\rightarrow$   $i$  [PF]  
 $u$  [PVR]  $\rightarrow$   $u$  [PVFR]  
 $o$  [VOR]  $\rightarrow$   $ɔ$  [VFOR]

These processes are illustrated in Figure 10.1, which gives a synchronic picture of the diachronic change from Old to modern Mongolian. This figure (from Svartesson 1995b) is an F1–F2 diagram showing simultaneously the long vowels of Dörbed Kalmuck and Shiliin Gol Mongolian. Vowels which have been formed by palatalization are not shown. The Kalmuck vowels are encircled, and arrows point towards the etymologically corresponding Mongolian vowels. The Kalmuck vowels are unchanged compared to Old Mongolian, and the Shiliin Gol Mongolian vowels have gone through pharyngealization (dotted arrows) and velarization (solid arrows). The vowel \**i* split into two phonemes, *i* and *ɪ*, in Shiliin Gol (see 10.2). The only unaffected vowel is *a*. It can be seen from Figure 10.1 that velarization changes the formants in the direction of the vowel [o], with the feature specification [VOR], having [velar] as its only place feature. Pharyngealization has its locus in the area of [a] with [pharyngeal] as its place feature. The main acoustic effects of velarization and pharyngealization are to decrease F2 and to increase F1, respectively.

The different Mongolic languages have gone through velarization and pharyngealization to different extents, and exactly which vowels are involved varies from

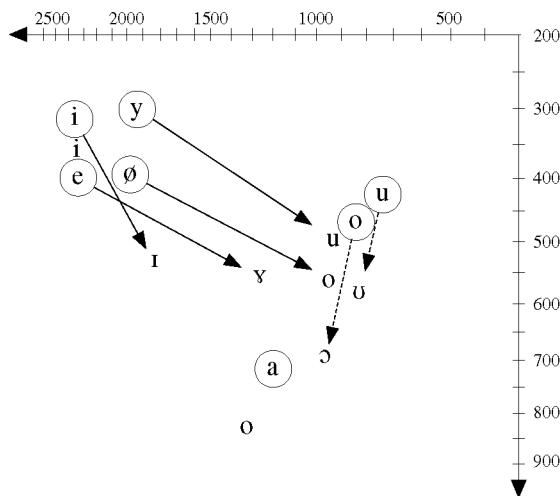


FIGURE 10.1 The Mongolic vowel shift illustrated synchronically

language to language. The basic vowel correspondences in initial syllables are summarized in (3), which shows the reflexes of short initial vowels in environments where other vowel-changing processes, such as palatalization and \*i-assimilation have not taken place.

(3) *Main reflexes of short vowels in initial syllables*

The Dagur reflex *wa* of \*u is due to ‘breaking’ (see 10.7.5).

OM	*a	*o	*u	*e	*ø	*y	*i
Hlh	a	ɔ	ʊ	i	o	u	i
Cha	a	ɔ	ʊ	y	o	u	i
Baa	a	ɔ	ʊ	y	o	u	i
Bur	a	ɔ	ʊ	e	u	u	e
Kmn	a	ɔ	ʊ	e	u	u	i
Klm	a	o	u	e	ø	y	i
Dag	a	ɔ	ɔ, wa	y	u	u	i
ShY	a	ɔ	ʊ	e	ø	u	y
Mgr	a	o	u, o	i, e	o, u	u	i
San	a	o	u	ie, e	o	u	i
Bon	a	o	u	e	o	u	i, u
KJ	a	ʊ, ɔ	ʊ	e	o, u	u	i
Mog	a, o	o	u	e	o	u	i

Examples (9.13): \*/a/: \*alt<sup>h</sup>an, \*ap, \*č<sup>h</sup>asun, \*kar, \*k<sup>h</sup>aara, \*t<sup>h</sup>apun; \*/o/: \*hon, \*nok<sup>h</sup>ai, \*ol, \*ora, \*pos, \*t<sup>h</sup>osun; \*/u/: \*hulahan, \*kurpan, \*k<sup>h</sup>uruuhun, \*sur, \*ukija, \*usun; \*/e/: \*ene, \*ker, \*k<sup>h</sup>eelen, \*mete, \*nere, \*peri; \*/ø/: \*k<sup>h</sup>øk<sup>h</sup>e, \*k<sup>h</sup>øl, \*k<sup>h</sup>ølesyn, \*mørl, \*nøk<sup>h</sup>er, \*øk; \*/y/: \*k<sup>h</sup>ynty, \*k<sup>h</sup>yr, \*k<sup>h</sup>yreken, \*syk<sup>h</sup>e, \*yče, \*yk<sup>h</sup>y; \*/i/: \*čil, \*čhik<sup>h</sup>in, \*nis, \*pic<sup>h</sup>i(k), \*sini.

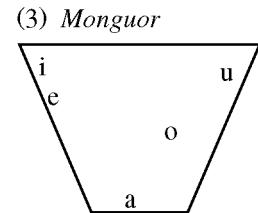
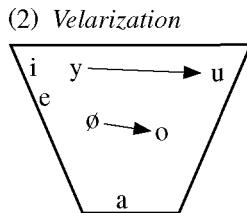
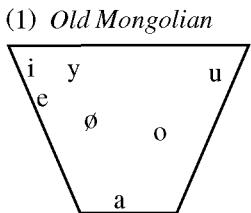
With respect to the vowel shift, the modern Mongolic languages can be divided roughly into four types: the Oirad, Monguor, Mongolian, and Dagur types. We illustrate them with stylized vowel diagrams in Figure 10.2.

The Old Mongolian vowel system is retained in Oirad (including Kalmuck), with the vowel e added by palatalization.

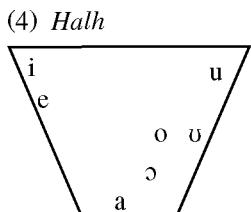
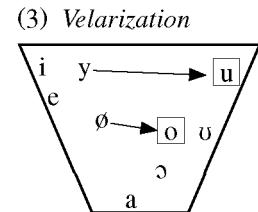
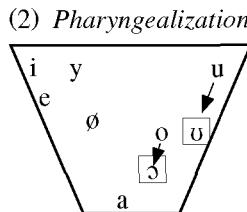
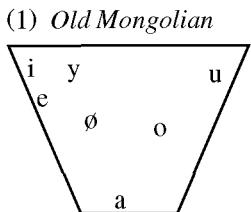
In Monguor, Santa, Bonan, and Moghol, \*y and \*ø were velarized and merged with \*u and \*o, leading to a five-vowel system; see Figure 10.2a.

The vowels were changed by pharyngealization and velarization in Mongolian, Buriad, Kamnigan, Shira Yugur, and Kangjia. The back vowels \*u and \*o were pharyngealized to ʊ and ɔ in all these languages. Velarization of the three front vowels \*e, \*ø, \*y took place in most non-Halh Mongolian dialects including Baarin and Chahar, and also in some Halh dialects in the south, such as Shiliin Gol. In Standard Halh, Kamnigan, and Kangjia, only \*ø and \*y were velarized, and in Shira Yugur only \*y. These changes did not cause mergers, so the contrasts of the original seven-vowel system are retained, but the vowel qualities have changed, leading to vowel systems such as that in Halh, illustrated in Figure 10.2b.

## (a) Monguor type



## (b) Mongolian type



## (c) Dagur type

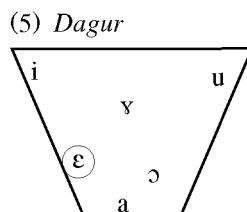
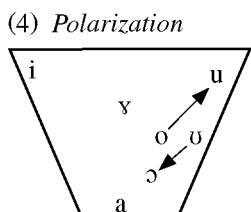
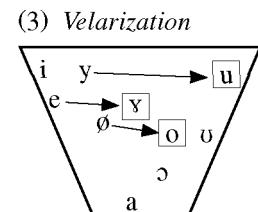
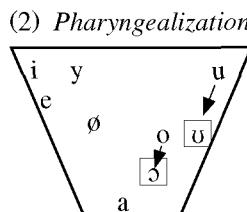
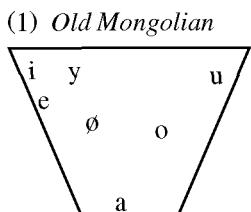


FIGURE 10.2 Mongolic vowel shifts

Dagur has apparently gone through the same developments as the languages of the Mongolian type, followed by a polarization of the rounded vowels so that the features [open] and [pharyngeal] either occur together or not at all for these vowels. This caused *u* [FR] to merge with *ɔ* [FOR] and *o* [OR] to merge with *u* [R]. As in the languages of the Monguor type, this led to a five-vowel system (see Fig. 10.2c), but the Dagur vowels *u* and *ɔ* have different origins than Monguor *u* and *o*. The vowel *ɛ* was added by other processes.

## 10.2 VOWEL SPLITS AND MERGERS<sup>3</sup>

In Chahar and some other dialects of South Mongolia (including Shiliin Gol, Harchin, and Urad), the initial vowel \**i* has split into two phonemes, depending on the vowel harmony class of the other vowels of the word. In words which contain back non-initial vowels in Old Mongolian, initial \**i* either became *i* or was assimilated to the following vowel. In words with Old Mongolian front vowels, \**i* is retained, if it is not assimilated, as is often the case when the following vowel is \**y* (>*u*). When final vowels disappeared, the allophonic variation between [i] and [ɪ] became contrastive, and the Old Mongolian phoneme \*/i/ split into two, /i/ and /ɪ/:

(4)	Old Mongolian	*čita ‘spear’	*ite ‘to eat’
	pharyngealization	čita	—
	vowel deletion (7)	čit	it
	Chahar	čit	it

Other examples are OM \**kʰilpar* ‘easy’ and \**mijkʰan* ‘thousand’, which are *xilpər* and *mijk* in Chahar. Chahar *i* corresponds to *ɛ* in Baarin, where the exemplified words are čet, *xelpər*, *meyŋ*. In Halh, \**i*-assimilation is obligatory in original back-vocalic words (10.7.3), and the exemplified words are čat жад, *x'ałprər* хялбар, *majŋ* мянга.

Initial short \**i* and \**e* have merged to *i* in Halh, at least in the variant spoken in Ulaanbaatar. According to Möömöö and Mönh-Amgalan (1984: 82), this merger took place in Central Halh in general (cf. also Vladimircov 1929: 148ff.; Luvsambaldan 1982). These vowels have been kept distinct in most variants of Southern and Eastern Mongolian, with \**e* velarized to *ɤ*. Short \**i* and \**e* usually merged to *e* (pronounced [ɯ]) in Buriad, and to *i* in Monguor. Examples are OM \**kʰelen* ‘tongue’ and \**ite* ‘to eat’, which became *xi᷑* хэл, *it* ид in Halh, *xelən*, *ed᷑ə* in Buriad, *kʰile*, *ite* in Monguor, and *xvł*, *it* in Chahar and Baarin. At least partial merger of \**i* and \**e* took place in Urad (Batusayiqan 1985; Möngkebuyan 1992a; 1997) and Ordos (Serengnorbu 1996; Möngkebuyan 1990).

<sup>3</sup> For notes and sources, see App. J, 10.2, p. 229.

In Buriad (except the western dialects) and in (Urul'ga) Kamnigan, short initial \*y and \*ø merged to *u*. The same development took place in Dagur, in the context of other vowel changes. In Mongolian proper, these vowels are kept apart, as *u* and *o*. Examples are OM \*øk 'to give' and \*hyk<sup>h</sup>er 'ox', which became *uge*, *uxər* in Buriad, *uk*, *uk<sup>h</sup>er* in Kamnigan, *uk<sup>w</sup>h*, *xuk<sup>w</sup>hər* in Dagur, but *og* ᠠగ, *uxər* ᠢᢪර in Halkh (see also 9.2).

In Eastern Mongolian dialects, especially Baarin and Harchin, as well as in Dörbed Kalmuck, \*u and \*y regularly became open before labial consonants, merging with the reflexes of \*o and \*ø, respectively. Examples are Baarin and Harchin *sɔm* 'arrow', *som* 'temple', *xəep* 'destiny' vs. Halkh *sɔm* cym, *sum* cym, *xuw<sup>j</sup>* хувь (OM \*sumun, \*syme, \*k<sup>h</sup>upi). In Dörbed, these words are *somn*, *søm*, *xøw*, whereas the standard Kalmuck forms (based on the Torguud dialect) are *sumn*, *sym*, *xyw*. This development took place after labial consonants as well, but less regularly. An example is Baarin and Harchin *pɔlək*, Halkh *puʃəg* булаг 'spring', OM \*pulak.

A few words with Old Mongolian \*y, including \*yntyr 'high' and \*yttyr 'day', have reflexes of \*ø rather than \*y in many modern languages, including Mongolian (Halkh *ontər* ᠢндөр, *otər* ᠠдор) and Oirad (Kalmuck *øndr*, *ødr*) (see also Vladimirov 1929: 155).

### 10.3 LONG VOWELS<sup>4</sup>

All modern Mongolic languages except Moghol, Santa, Kangjia, the Minhe dialect of Monguor, and the Jishishan dialect of Bonan have contrastive vowel length. Its absence in these languages is due to a late process which made all vowels short. In Mongolian, Buriad, Oirad, Dagur, and Bonan there is a quantity contrast only in the initial syllable.

Although some languages have 'primary' long vowels, possibly inherited from Proto-Mongolic (8.5.1), the long vowels of most modern Mongolic languages are 'secondary' in the sense that they have developed from Old Mongolian \*VhV or \*ijV combinations.

The development of these groups in the modern languages is shown in (5). Because there are rather few examples for some of the individual \*VhV groups, it is not always possible to trace their development accurately, especially in the lesser known languages.

When the two vowels surrounding \*h were identical, the \*VhV group usually developed to a long vowel with the same quality as the corresponding short vowel. The groups \*oha and \*øhe developed to long monophthongs corresponding to short \*o and \*ø. Groups of the form \*ihV and \*ijV developed in the same way as the \*VhV groups with identical vowels, except that the preceding consonant was palatalized in some languages (see 10.11.1).

<sup>4</sup> For notes and sources, see App. J, 10.3, p. 229.

## (5) Old Mongolian \*VhV and \*ijV groups

Reflexes in initial/non-initial syllables are separated with a slash. Shortening of etymologically long vowels in non-initial syllables (10.5.1) is not indicated. For reflexes given in parentheses, we have only one example.

OM	*aha	*ehe	*oha	*øhe	*uhu	*yhy	*ahu	*ehy	*uha	*yhe
	*iha/ija	*ihe/ije			*ihu		*au			
Hlh	aa	ee	ɔɔ	oo	uu	uu	uu	uu	(ɔ)	(o)
Cha	aa	yy	ɔɔ	oo	uu	uu	uu	uu		(o)
Baa	aa	yy	ɔɔ	oo	uu	uu	uu	uu	(ɔ)	
Bur	aa	ee	ɔɔ	oo	uu	uu	uu	uu		(oo)
Kmn	aa	ee	(ɔɔ)	(ee)	uu		ɔɔ	ee		
Klm	aa	ee/ɛ	oo	øø	uu	yy	uu	yy	(a)	(ɛ)
Dag	aa	yy	ɔɔ		ɔɔ	uu	au/ɔ	vu		(y)
ShY	aa	ii, e(e)	uu	y(y)	uu	y(y)	uu	y(y)	(oo)	(øø)
Mgr	aa	ee	oo	oo	uu/i	u(u)	au,u	u(u)		
San	a	ie, e		o	u	u	au,u			(o)
Bon	aa	ee, ii		oo	uu/o		uu			
KJ	a, (ɔ)	e	u	o	u		u,ɔ			(u)
Mog	o, a	ei/a	(o)	(u)	u	(u)	au	(oi)		

Examples (9.13): \*/aha/: \*k<sup>h</sup>aha, \*nahat, \*saha, \*č<sup>h</sup>akahan, \*hulahan, \*imahan; \*/ihal/: \*čiha, \*ač<sup>h</sup>ihan; \*/ija/: \*t<sup>h</sup>ak<sup>h</sup>jia, \*ukija; \*/ehe/: \*nehe, \*tehere, \*tehesyn, \*emehel, \*inehe, \*i<sup>h</sup>emeheñ; \*/ihe/: \*sihe, \*k<sup>h</sup>ič<sup>h</sup>ihe, \*sirihe; \*/ije/: \*k<sup>h</sup>ečiye, \*ynijen; \*/oha/: \*k<sup>h</sup>ohasun, \*t<sup>h</sup>ohan, \*čirkohan; \*/øhe/: \*čøhelen, \*pøhere, \*pøhesyn; \*/uhu/: \*huhut<sup>h</sup>a, \*uhu, \*k<sup>h</sup>uruhun, \*niruhun; \*/ihu/: \*nihu, \*arihun, \*kasihun; \*/yhy/: \*tyhyreyj, \*yčyhyr; \*/ahu/: \*ahula, \*čahu, \*sahu, \*čalahu, \*čilahun, \*k<sup>h</sup>alahun; \*/au/: \*k<sup>h</sup>auc<sup>h</sup>in, \*t<sup>h</sup>aulai; \*/ehy/: \*ehyten, \*sehyl, \*tehy; \*/uha/: \*hiruhar; \*/yhe/: \*hiryher.

In a few cases, the \*VhV groups developed vowel qualities different from the corresponding short vowels. The mergers of \*i and \*e to i in Halk and Monguor, and of \*y and \*ø to u in Buriad, concern only short vowels. Thus \*ehe became ee in Halk and Monguor, and \*øhe became oo in Buriad. In Shira Yugur, \*oha and \*yhy developed to uu and yy, while the short vowels \*o and \*y became ɔ and u.

The groups \*ahu and \*ehy are often retained as diphthongs in Dagur, Monguor, Santa, and Moghol, while they became monophthongs, usually merging with the combinations \*uhu and \*yhy, in the other languages. Thus, \*ahu became uu in Mongolian and Buriad and uu in Oirad. It developed in its own way in Kamnigan, becoming ɔɔ, while \*uhu became uu. The diphthong \*au developed in the same way as \*ahu. The rather rare combinations \*uha and \*yhe have developed in ways similar to \*oha and \*øhe (Poppe 1950; Thomsen 1958; Kuribayashi 1984).

### 10.4 \**i*-DIPHTHONGS<sup>5</sup>

The Old Mongolian \**i*-diphthongs are preserved as diphthongs in most languages (6). In the Eastern Mongolian dialects, in some Southern Mongolian dialects, including Shuluun Höh Chahar, and in Oirad, the diphthongs were monophthongized, and some monophthongization took place in other languages as well. The Old Mongolian back vowels \*ai and \*oi became front vowels both in Baarin ( $\varepsilon\varepsilon$ ,  $\alpha\alpha$ ) and in Kalmuck ( $\varepsilon\varepsilon$ ,  $\phi\phi$ ). However, this had different consequences for vowel harmony in these two languages (see 10.11.3).

#### (6) Old Mongolian \**i*-diphthongs

Reflexes in initial/non-initial syllables are separated with a slash. See section 10.7.1 for the development of \*ai in non-initial syllables when the first syllable has the vowel \*o. The Dagur reflexes *wai* and *wyi* of \*ui/oi and \*yi are due to ‘breaking’ (see 10.7.5).

OM	*ai	*oi	*ui	*ei	*øi	*yi
Hlh	ai	ɔi	vi	ii	ui	(ui)
Cha	ɛɛ	œœ	vɪ	(ii)	ii	(yi)
Baa	ɛɛ	œœ	vʏ	(ii)	yy	(yy)
Bur	ai	ɔi	vi	ii	ui	(ui)
Kmn	ai	ɔi			(ui)	
Klm	ɛɛ/a	ɸɸ		(i)	ii	(yy)
Dag	ai/Ø	ɔi, (wai)	(wai)	(yi)	ui	(wyi)
ShY	ai, ei	ɔi		(ii, vʏ)	y(y)	(u)
Mgr	ai			ii	ui	(u)
San	ei	ui	(ui)	(ai, i)		(ui)
Bon	ii, ui	ii		(ii)	i(i)	(wi)
KJ	ai, ei		(i)	(e)	(ui)	(i)
Mog	(oi/ei)	oi	(ui)	(ei, a)		

Examples (9.13): \*/ai/: \*k<sup>h</sup>aič̥i, \*naiman, \*sain, \*kak<sup>h</sup>ai, \*k<sup>h</sup>ulakai, \*t<sup>h</sup>aulai; \*/oi/: \*hoi, \*k<sup>h</sup>oina, \*noir, \*oirai; \*/ui/: \*k<sup>h</sup>ui, \*uila; \*/ei/: \*k<sup>h</sup>ei, \*nek<sup>h</sup>ei; \*/øi/: \*k<sup>h</sup>øisyn, \*k<sup>h</sup>øit<sup>h</sup>en; \*/yi/: \*yile.

## 10.5 VOWEL DELETION AND REDUCTION

Different vowel deletion and reduction processes have affected all modern Mongolic languages except Kamnigan and Moghol. In some languages, non-initial

<sup>5</sup> Sanžeev (1940: 12f.); Pavlov (1963a; 1974); Verba (1980); Tömörtogoo (1985); Öljeiyibürin (1996); Yu Rong (2002).

vowels were deleted or reduced, but in others this happened to initial vowels. This may have been due to different stress patterns in different languages, but virtually nothing is known about stress in the older stages of the languages, and we will not speculate on this.

The Old Mongolian sources generally preserve all vowels, except that Arabic Mongolian tends to delete some initial vowels (see Saitô 1996a).

### 10.5.1 Reduction of short non-initial vowels<sup>6</sup>

Some Old Mongolian short non-initial vowels correspond to schwa vowels in Halk (e.g. OM \**kačar* > Halk *gacər* газар ‘ground’), some have a zero reflex (\**emys* > *oms* ᠠMC ‘to wear’), and some correspond to a schwa at another place than in Old Mongolian (‘metathesis’, e.g. \**arka* > *arəG* apra ‘method’). It was shown in Chapter 6 that Halk schwas are epenthetic vowels which are not present in phonological representations, but are inserted by rules. This makes it possible to analyse all cases of vowel reduction in Mongolian by a vowel deletion rule:

#### (7) *Deletion of short vowels*

All short vowels in non-initial syllables are deleted from the phonological representation.

This rule applies to all dialects of Mongolian proper, as well as to Buriad (except for word-final vowels (see 9.2), Oirad, and Dagur. Other Mongolic languages normally preserve non-initial vowels. Numerous examples can be found in the comparative vocabulary (9.13).

If necessary, non-phonemic schwa vowels are inserted to make well-formed syllables after rule (7) has applied. The derivations of some words which illustrate the interaction of vowel deletion and schwa epenthesis in Halk are shown in (8).

(8)		‘blue’	‘to wear’	‘ground’	‘method’
Old Mongolian		*k <sup>h</sup> øk <sup>h</sup> e	*emys	*kačar	*arka
segmental changes	xoxe	omus	gacar	arga	
vowel deletion	xox	oms	gacr	arg	
phonological represen-	/xox/	/oms/	/gacr/	/arg/	
tation					
schwa epenthesis	—	—	gacər	arəG	
Halk surface form	xox xox	oms ᠠMC	gacər газар	arəG apra	

From examples as \**arka* > *arəG* ‘method’, it can be seen that ‘metathesis’ does not result from a special metathesis rule, but from the interaction of vowel deletion and epenthesis. In this example, the second vowel is deleted, and then a schwa is inserted into the surface form to make well-formed syllables, using rule (6) in Chapter 6.

<sup>6</sup> Arai (1960); Pavlov (1963a; 1982); Kurabayashi (1988; 1992); Engkebatu (1994a); Qasbagan-a (2000b).

Long vowels, which were formed from \*VhV and \*ijV groups (10.3), are not deleted in non-initial syllables, so their development must have preceded the vowel deletion rule (7). When the short vowels have been deleted, only long vowels and diphthongs remain in the phonological representation of non-initial syllables. Since only one vowel quantity remains, it is natural to reinterpret it as the unmarked quantity, that is, short (see section 1.1 for acoustic support for this). This process can be formulated as a rule, which applies in those languages where the vowel deletion rule applies (9).

(9) Long non-initial vowels become short.

Some derivations involving this rule are shown in (10). It is obvious that it must be applied after the deletion of medial \*h, and after the deletion of short vowels. The order of the other segment-changing rules is irrelevant here, except that the rule which changes onset \*k to g must apply before short vowels are deleted.

	'gate'	'red'	'warm'	'beast'
Old Mongolian	*k <sup>h</sup> ahalka	*hulahan	*k <sup>h</sup> alahun	*k <sup>h</sup> orehesy/n
deletion of *h	k <sup>h</sup> aalka	ulaan	k <sup>h</sup> alaun	k <sup>h</sup> oreesy
other segmental changes	xaal <sup>g</sup> ga	v <sup>g</sup> zaan	xaal <sup>g</sup> un	goroosu
deletion of short vowels	xaal <sup>g</sup> G	—	—	goroos
shortening of long vowels	—	v <sup>g</sup> an	xaal <sup>g</sup> un	goros
phonological representation	/xaal <sup>g</sup> G/	/v <sup>g</sup> an/	/xaal <sup>g</sup> un/	/goros/
vowel epenthesis	xaal <sup>g</sup> eG	—	—	—
Halk surface form	xaal <sup>g</sup> eG	v <sup>g</sup> zaan	xaal <sup>g</sup> un	goros
	хаалга	улаан	халун	гороос

As mentioned in section 6.6, monosyllabic words consisting of an open syllable always have a long vowel in Mongolian proper. In Kalmuck as well, there is no vowel length contrast in this position. In the Cyrillic Kalmuck orthography, these words are written with single vowel letters, for example, cy <su> 'to sit'. Sanžeev (1978) says that these vowels are long, as in Mongolian (Halk suu cyy) and Buriad (huu), but shows that the duration of these vowels are closer to short than to long vowels (see also Bitkeev 1970; 1975a; 1983: 8; Pavlov 1983: 43). The etymologically long vowels are thus shortened in this position, but turn up as long vowels in inflected forms, for example, in the future participle cyyx <suux> of the exemplified Kalmuck word.

There is a contrast between long and short vowels in monosyllabic words which end in a consonant both in Kalmuck and Halk. Monosyllabic words which have an etymologically long vowel (or a diphthong) have a short vowel in Kalmuck if they ended in a consonant in Old Mongolian (e.g. OM \*sehyl > Klm syl 'tail'; \*noir > nør 'sleep'), but a long vowel if they ended in a consonant+vowel combination (e.g. \*ahula > uul 'mountain', \*oira > øør 'near') (see also Benzing 1985: 177).

### 10.5.2 *Deletion of initial vowels*<sup>7</sup>

In the Mongolic languages spoken in the Gansu–Qinghai area (Shira Yugur, Mon-guor, Santa, Bonan, and Kangjia) there is an opposite tendency to delete initial vowels. This is only a tendency, and not a strict rule, however. Vowels in absolute word-initial position, not preceded by a consonant, are most liable to be deleted, but deletion is common also when the word-initial consonant was a fricative (\**s* or \**h*). After other initial consonants, vowels are deleted only sporadically. The vowel quality plays a role as well. The vowels \**u*, \**y*, \**e* are deleted rather often, \**i* and \**ø* more seldom, and \**a* and \**o* only rarely. Few words lost the initial vowel in Santa, and almost all of them had word-initial \**e*. It should be emphasized that the great majority of words retain their initial vowels in these languages. The deletion of initial vowels created initial consonant clusters, unknown in other Mongolic languages, but occurring in the Tibetan dialects in the same area, so this can be regarded as an areal feature (Kim Pang-han 1969; 1973; Janhunen 2001). Examples of words with initial vowel deletion (italicized) are given in (11).

#### (11) *Deletion of initial vowels*<sup>8</sup>

OM	ShY	Mgr	San	Bon	KJ	
*emys	<i>mys</i>	<i>mosi</i>	<i>misuu</i>	<i>muš</i>	<i>mysuu</i>	‘to wear’
*epesyn	<i>wesyn</i>	<i>wesi</i>	<i>osuj</i>	<i>epsoŋ</i>	<i>weisun</i>	‘grass’
*unt <sup>h</sup> a	<i>nta</i>	<i>nt<sup>h</sup>aa</i>		<i>t<sup>h</sup>aa</i>		‘to sleep’
*urt <sup>h</sup> u	<i>hurt<sup>h</sup>u</i>	<i>štur</i>	<i>xutu</i>	<i>štur</i>	<i>štus</i>	‘long’
*yk <sup>h</sup> y	<i>hk<sup>h</sup>u</i>	<i>xuku</i>	<i>xuku</i>	<i>hku</i>	<i>ku</i>	‘to die’
*ite	<i>ete</i>	<i>ite</i>	<i>itie</i>	<i>nte</i>	<i>ite</i>	‘to eat’
*øk <sup>h</sup> in	<i>hk<sup>h</sup>on</i>	<i>ščun</i>	<i>ot<sup>h</sup>in</i>	<i>ok<sup>h</sup>un</i>		‘girl’
*hičhe	<i>hčhe</i>	<i>ščee</i>	<i>šiče</i>	<i>šče</i>	<i>šči</i>	‘ashamed’
*sityn	<i>štyn</i>	<i>šti</i>	<i>šituŋ</i>	<i>štoŋ</i>	<i>šituŋ</i>	‘tooth’
*sumun	<i>svyvn</i>	<i>sumu</i>	<i>sumu</i>	<i>smo</i>	<i>stumu</i>	‘arrow’
*k <sup>h</sup> øk <sup>h</sup> e	<i>hk<sup>h</sup>ø</i>	<i>k<sup>h</sup>uko</i>	<i>k<sup>h</sup>ukie</i>	<i>k<sup>h</sup>uko</i>	<i>k<sup>h</sup>uk<sup>h</sup>u</i>	‘blue’
*t <sup>h</sup> at <sup>h</sup> a	<i>ht<sup>h</sup>a</i>	<i>t<sup>h</sup>ita</i>	<i>sta</i>	<i>šta</i>	<i>st<sup>h</sup>a</i>	‘to pull’

In a few words, including \**umart<sup>h</sup>a* ‘to forget’ (Halla *mart<sup>h</sup> mapr*), the initial vowel disappeared in all modern languages (cf. Garudi 1996; 1999).

### 10.6 NON-INITIAL VOWELS AND VOWEL HARMONY

As seen in Chapter 8, there was a four-way vowel contrast in Old Mongolian non-initial syllables between \**i*, \**A* (\**a* ~ \**e*), \**U* (\**u* ~ \**y*), and \**O* (\**o* ~ \**ø*). The third alternation pair, \**o* ~ \**ø*, was rare, appearing only after \**i* in the initial syllable. The

<sup>7</sup> Kotwicz (1939); Todaeva (1973); Bulucilagu (1989); Qasbagan-a (1998); Qasbagatur (1999).

<sup>8</sup> These tables illustrate phenomena which apply only to some of the words. The words to which they apply are italicized. (See also (37), (38), (39), (40), (41).)

development of non-initial vowels is shown in (12). In Mongolian, Buriad, Oirad, and Dagur, short non-initial vowels were deleted from the phonological representation, appearing on the phonetic surface as schwas or not at all. In the remaining modern languages, non-initial vowels developed more or less like initial vowels. The contrast between non-initial \**a/e* and \**u/y* which existed in Old Mongolian was lost in Mongolian, Buriad, and Oirad, but is retained in Dagur as a contrast between plain and labialized consonants. The contrast with \**i* is retained in all languages, either in the vowel itself or as palatalization of the preceding consonant.

There is a special development in Kangjia, where a final \**Vn* combination often became ɔ, for example, OM \**alθ̥an* ‘gold’ > KJ *antʰɔ*; OM \*č̥ikʰin ‘ear’ > KJ č̥ixɔ.

### (12) *Vowels in non-initial syllables*

Mongolian, Buriad, Kalmuck, and Dagur schwas are written as Ø. See section 10.7.1 for the developments after initial \**o* and \**ø*.

OM	* <i>a</i>	* <i>u</i>	* <i>e</i>	* <i>y</i>	* <i>i</i>
Hlh	Ø	Ø	Ø	Ø	Ø
Cha	Ø	Ø	Ø	Ø	Ø
Baa	Ø	Ø	Ø	Ø	Ø
Bur	Ø	Ø	Ø	Ø	Ø
Kmn	a	ʊ	e	u	i
Klm	Ø	Ø	Ø	Ø	Ø
Dag	Ø	Ø	Ø	Ø	Ø
ShY	a	v, u	e	v, u	v
Mgr	a	u, i	e	i, u	i
San	a	u	ie, e	u	i
Bon	a	w, o	w	o	w
KJ	a, (ɔ)	v	e	u	i
Mog	a, o	u	a	u	i

Examples (9.13): \*/*a/*: \**alθ̥an*, \**kačar*, \**kurpan*, \**kʰara*, \**mikʰan*, \**sira*; \*/*u/*: \*č̥*asun*, \**nasun*, \**taru*, \**tʰapun*, \**urtʰu*, \**usun*; \*/*e/*: \**ene*, \**ite*, \**kʰelen*, \**mete*, \**tehere*, \**yče*; \*/*y/*: \**kʰetyn*, \**kʰynty*, \**nityn*, \**pøhesyn*, \**sityn*, \**ykʰy*; \*/*i/*: \*č̥*ikʰin*, \**kʰari*, \**kʰonin*, \**morin*, \**pari*, \**peri*.

#### 10.6.1 *Vowel harmony shifts*<sup>9</sup>

The vowel shifts in the different Mongolic languages resulted in changes of the vowel harmony system or in some cases even in vowel harmony loss. The conse-

<sup>9</sup> Hattori (1975; 1978); Gregerson (1976: 361ff.); Yu Shichang (1983: 28ff.); Rialland and Djamouri (1984); Svantesson (1985); Kim Chu-wǒn (1988a, b; 1992; 1993; 1997; 1999a). Vago (1973), S. Anderson (1980) and Binnick (1991) regard the vowel shifts as destructive for vowel harmony. See also Darbee (1996: 117ff.).

quences for vowel harmony roughly depend on the four types of vowel changes outlined in section 10.1. Since Old Mongolian vowel harmony was based on the three back ~ front vowel pairs  $*a \sim *e$ ,  $*o \sim *\emptyset$ , and  $*u \sim *y$ , the development of these pairs is crucial for the fate of vowel harmony, as illustrated in (13).

(13) *Vowel harmony shifts*

OM		Kalmuck		Monguor		Mongolian		Dagur	
$*a$	$*e$	a	e	a	e	a	$e/\gamma$	a	y
$*o$	$*\emptyset$	o	$\emptyset$	o		$\emptyset$	o	$\emptyset$	$\emptyset$
$*u$	$*y$	u	y	u		$\emptyset$	u	$\emptyset$	u
$*i$		i		i		i		i	

The four types of vowel changes resulted in four types of vowel harmony shifts:

- (a) Oirad (including Kalmuck) has retained the Old Mongolian vowel system, including palatal vowel harmony.
- (b) In the languages of the Monguor type (Monguor, Santa, Bonan, Moghol), velarization merged the front rounded vowels  $*y$  and  $*\emptyset$  with their vowel harmony alternants  $*u$  and  $*o$ . This destroyed the basis for vowel harmony, which was lost as a productive process in these languages.
- (c) In languages of the Mongolian type (Mongolian, Buriad, Kamnigan, Shira Yugur, Kangjia), the vowel shift resulted in a shift of the basis for vowel harmony from palatal to pharyngeal. Although velarization and pharyngealization took place to different extents in these languages, the vowels of alternation pairs ( $a \sim e/\gamma$ ,  $o \sim o/\emptyset$ ,  $u \sim u$ ) are differentiated by the feature [pharyngeal].
- (d) In Dagur, the development went one step beyond this, by merger of the rounded back (>pharyngeal) vowels ( $*u > \emptyset > \emptyset$ ;  $*o > \emptyset$ ), and of the rounded front (>non-pharyngeal) vowels ( $*y > u$ ,  $*\emptyset > o > u$ ). Still, what remains of vowel harmony is based on the feature [pharyngeal].

#### 10.6.2 *Vowel harmony in Old Mongolian and Halk*

Halk vowel harmony was described in section 5.2 and Old Mongolian vowel harmony in section 8.6. They differ from each other in several ways: (a) Old Mongolian vowel harmony was based on the feature [palatal] while Halk vowel harmony is based on the feature [pharyngeal]; (b) the vowel  $*i$  is completely neutral in Old Mongolian, but only partially neutral in Halk; (c) vowel harmony is cyclic in Halk but not in Old Mongolian; (d) Halk has rounding harmony, but Old Mongolian lacks it.

Using the vowel features introduced in section 5.1, the Old Mongolian vowels can be represented as in (14).

(14) *Old Mongolian vowel features*

		<i>fully specified</i>	<i>underspecified</i>
<i>back (non-palatal):</i>	*a	[FO]	[O]
	*o	[VOR]	[OR]
	*u	[PVR]	[R]
<i>front (palatal):</i>	*e	[PO]	[PO]
	*ø	[POR]	[POR]
	*y	[PR]	[PR]
<i>neutral:</i>	*i	[P]	[]

In the full feature specification, front vowels are characterized by having the feature [palatal] as their only place feature, lacking the features [velar] and [pharyngeal]. We will, however, use the underspecified representations where the front vowels have the place feature [palatal], and the back vowels lack place features, so that front and back vowels differ only by the presence or absence of the feature [palatal]. This makes it possible to analyse back ~ front vowel harmony as spreading of the feature [palatal].

We represent Old Mongolian root morphemes so that the non-place features [round] and [open] are associated to the respective vowels, while the place feature [palatal] (if present) is attached to a root, but is not associated directly to the initial vowel (unlike the situation in Halkh). This is because initial \*i does not determine the palatality of the other vowels in a word. The feature [palatal] cannot be attached to the phonological representation of a suffix. When the place feature [palatal] is lifted off the non-initial vowels, they can be represented by each of the four combinations of the non-place features [open] and [round], forming the vowel \*i and the archiphonemes \*A, \*O, \*U:

	<i>archiphoneme</i>	<i>realization in back-vocalic words</i>	<i>realization in front-vocalic words</i>
i	[]	[] i	[P] i
U	[R]	[R] u	[PR] y
A	[O]	[O] a	[PO] e
O	[OR]	[OR] o	[POR] ø

The vowel shift changed only the place features, causing the harmonizing feature to shift from [palatal] in Old Mongolian to [pharyngeal] in Halkh. The Old Mongolian marked vowels \*ø, \*y became unmarked u, o in Halkh, and the unmarked vowels \*u, \*o became marked v, o (16).

(16) *Vowel harmony shift in Halk*

<i>Old Mongolian</i>	<i>Halk</i>
<i>palatal:</i>	*e [PO] <i>non-pharyngeal:</i> e [O]
*ø [POR]	o [OR]
*y [PR]	u [R]
<i>non-palatal:</i>	*a [O] <i>pharyngeal:</i> a [FO]
*o [OR]	ɔ [FOR]
*u [R]	ʊ [FR]
<i>neutral:</i>	*i [] <i>neutral:</i> i []

This is illustrated in (17), where the harmonizing feature [palatal] spreads in the Old Mongolian front-vocalic word \*sehyl-ečʰe (17a), but not in the back-vocalic word \*kačar-ačʰa (17b); conversely, the Halk harmonizing feature [pharyngeal] spreads in *gacr-as* in (b) but not in *suuʒ-es* in (a).

(17) *Comparison of vowel harmony in Old Mongolian and Halk*

<i>Old Mongolian</i>	<i>Halk</i>
(a) *sehyl-ečʰe ‘tail–ABL’	suuʒ-es ‘tail–ABL’
(b) *kačar-ačʰa ‘ground–ABL’	gacr-as ‘ground–ABL’

Old Mongolian \*i is completely neutral: words with initial \*i can take either front or back vowels in the following syllables (e.g. \*nityn ‘eye’; \*čʰisun ‘blood’); the first vowel that is not an \*i decides the vowel harmony class. We assume that the harmonizing feature [palatal] is attached to the root morpheme, but not to any of its vowels. In contrast, all Halk words with initial i must have non-pharyngeal vowels in following syllables. Halk \*i-assimilation (10.7.3) eliminated all occurrences of \*i in the initial syllable of back-vocalic words (e.g. OM \*čʰisun ‘blood’ > Halk čʰus چس), and in many front-vocalic words as well (e.g. \*nityn ‘eye’ > nut нүд). This did not change the vowel harmony class of the words involved, but regularized vowel harmony in the sense that it made the presence or absence of the harmonizing feature [pharyngeal] in the initial vowel determine its presence or absence in all following vowels except non-initial i; it can be noted, however, that /i/ is non-

contrastively pharyngealized to [i] in pharyngeal words, except after palatalized and alveopalatal consonants (1.1.2). Thus we can assume that the harmonizing feature [pharyngeal] is attached to the initial vowel in Halk, as illustrated in (18).

(18) *Words with initial \*i in Old Mongolian*

<i>Old Mongolian</i>	<i>Halk</i>
(a) *n <sup>h</sup> ity-pen 'eye-RFL'	nut-e 'eye-RFL'
$\left\{ \begin{array}{c} [P] \\ n \ V \ t \ V \\   \\ [R] \end{array} \right. \rightarrow \left\{ \begin{array}{c} [P] \\ n \ V \ t \ V - p \ V \ n \\   \quad   \\ [R] \quad [O] \end{array} \right.$	$\left\{ \begin{array}{c} n \ V \ t - V \\   \\ [R] \end{array} \right. \quad \left[ \begin{array}{c} [O] \end{array} \right]$

<i>Old Mongolian</i>	<i>Halk</i>
(b) *č <sup>h</sup> isu-pan 'blood-RFL'	č <sup>h</sup> us-a 'blood-RFL'
$\begin{array}{c} \check{c}^h \ V \ s \ V - p \ V \ n \\   \quad   \\ [R] \quad [O] \end{array}$	$\begin{array}{c} [F] \\ \check{c}^h \ V \ s \\   \\ [R] \end{array} \rightarrow \begin{array}{c} [F] \\ \check{c}^h \ V \ s - V \\   \\ [R] \quad [O] \end{array}$

Words with \*i as the only vowel can be either front- or back-vocalic in Old Mongolian, but in Halk they must be non-pharyngeal. This is illustrated in (19), which shows that those (rather few) words which have \*i as the only vowel and take back-vocalic suffixes in Old Mongolian have changed the vowel harmony class in Halk. This can be seen as the consequence of the fact that [pharyngeal] became the harmonizing feature in Halk: since i does not have this feature, it does not spread, and suffix vowels will not contain it.

(19) *Words with i as the only vowel*

<i>Old Mongolian</i>	<i>Halk</i>
(a) *k <sup>h</sup> i-k <sup>h</sup> y 'to do-FUTP'	xii-get 'to do-PFG'
$\left\{ \begin{array}{c} [P] \\ k^h \ V \end{array} \right. \rightarrow \left\{ \begin{array}{c} [P] \\ k^h \ V - k^h \ V \\   \\ [R] \end{array} \right.$	$x \ V \ V - g \ V \ t \quad \left[ \begin{array}{c} [O] \end{array} \right]$

<i>Old Mongolian</i>	<i>Halk</i>
(b) *nis-ka-pa 'fly-CAUS-PST'	nis-et 'fly-PFG'
$\begin{array}{c} n \ V \ s - k \ V - p \ V \\   \quad   \\ [O] \quad [O] \end{array}$	$\begin{array}{c} n \ V \ s - V \ t \\   \\ [O] \end{array}$

In section 5.2.6 we showed that the Halk harmonizing feature [pharyngeal] spreads from the first vowel of a word by a local rule which is cyclic in relation to the

morphology. There are no indications that Old Mongolian vowel harmony is cyclic, and it is possible to analyse it with a global rule that spreads the harmonizing feature [palatal] from the root throughout the word after all suffixes have been attached. The development of cyclicity in Halkh vowel harmony is due to the development of rounding harmony (see 10.7.1) and to a segmental rule which realizes the expected diphthong \*[oi] as [e]; see section 5.2.6.

## 10.7 VOWEL ASSIMILATION

Several different vowel assimilation processes took place in the modern Mongolic languages. The most widespread one is assimilation of \*i in the initial syllable to the vowel of the following syllable. In languages, such as Halkh, which have developed palatalized consonants, the assimilated \*i is often retained as palatalization of the preceding consonant. Ramstedt (1902: 45) used the term ‘breaking’ (*brechung*) for the combination of \*i-assimilation and consonant palatalization (10.11.1). Dagur, which is the only Mongolic language that has developed labialized consonants, has a parallel process which assimilates \*u to a following \*a, leaving labialization as a trace on the preceding consonant (10.7.5).

### 10.7.1 *Progressive rounding assimilation and the development of rounding harmony*

Although we reconstruct Old Mongolian without rounding assimilation or rounding harmony (8.6.1), some rounding assimilation took place already in the Old Mongolian sources, and in several modern languages (Mongolian proper, Buriad, Kamnigan, Shira Yugur, Dagur, and Kangjia) this led to the development of more or less regular rounding harmony, affecting both root and suffix vowels. Oirad, which did not shift the basis for vowel harmony from palatal to pharyngeal, has not developed rounding harmony, except in the Alshaa and Hoshuud dialects (Sun et al. 1990; Gereltü 1991; 1992). The remaining languages do not have productive vowel harmony of any kind, but rounding assimilation took place in some words where the first vowel was \*o or \*ø and the second was \*a or \*e (20). The non-open rounded vowels \*u and \*y did not trigger rounding assimilation in any modern or ancient Mongolic language.

### 10.7.2 *Regressive rounding assimilation<sup>10</sup>*

An initial \*e is usually rounded by a following \*y in Mongolian proper where it appears as o, in Kalmuck where it became ø, and in Buriad and Kamnigan where the reflex is u. It usually remained unrounded in the other modern languages. Examples are OM \*emys ‘to wear’, \*tʰemyr ‘iron’, which became oms ᠠMC, tʰomor

<sup>10</sup> Qaserdeni (1980a); Kögjiltü (1987a); Möngkebayan (2001).

(20) *Progressive rounding assimilation*

The table shows the development of non-initial vowels in words with initial \**o* or \**ø*.

OM	*a	*aha	*ai	*e	*ehe
Hlh	Ø	ɔ	ɔi	Ø	(o)
Cha	Ø	ɔ	œ	Ø	(o)
Baa	Ø	ɔ	ɔ	Ø	(o)
Bur	ɔ	ɔɔ	ɔi	e	(oo)
Kmn	ɔ	(əə)	(ɔi)	u	(ee)
Klm	Ø	a	a	Ø	(ɛ)
Dag	Ø	(a, ɔ)	Ø	Ø	(y)
ShY	ɔ	ɔɔ	ɔi	ø	(ee)
Mgr	o	oo	oi	o	
San	o	o	ei	ie	
Bon	o	o	ui	o	
KJ	ʊ	ʊ	vai	u	
Mog	(a, o)		(ai, oi)	(a)	

Examples (9.13): \*/a/: \**kʰola*, \**ora*, \**olan*; \*/aha/: \**nokahan*, \**tolahan*, \**tʰokahan*; \*/ai/: \**mokai*, \**nokʰai*; \*/e/: \**kʰøkʰe*, \**nøkʰer*, \**øijke*; \*/ehe/: \**kørehesyn*.

төмөр in Halth, *oms*, *tʰomør* in Chahar and Baarin, *umdɔ*, *tʰumør* in Buriad, *umut*, *tʰumur* in Kamnigan, and *øms*, *tʰømr* in Kalmuck.

10.7.3 *Regressive \*i-assimilation*<sup>11</sup>

The vowel \**i* was completely neutral in Old Mongolian vowel harmony, and could occur in the initial syllable of both front-vocalic and back-vocalic words. All occurrences of \**i* in the initial syllable of Old Mongolian back-vocalic words were eliminated in Halth by assimilation to the vowel of the following syllable (e.g. OM \**kʰilpar* ‘easy’ > Halth *x'ałpər* хялбар; \**kʰimusun* ‘nail’ > *xums* хүмс; \**sijkʰor* ‘falcon’ > *šɔŋxər* шонхор). The result is that *i* never occurs in the first syllable of a pharyngeal word in Halth. Initial \**i* was often assimilated to a following \**y* (> *u*) as well (OM \**ciryken* ‘heart’ > *curx* зүрх). When the assimilating vowel is \**a*, assimilation is often accompanied by palatalization of the consonant that precedes \**i* (see 10.11.1).

Assimilation of \**i* is also common in Chahar, but in some pharyngeal words, initial *i* has not been eliminated by assimilation, but by pharyngealization, splitting the \*/i/ phoneme into /i/ in non-pharyngeal and /i/ in pharyngeal words (see 10.2). There was a similar development in Baarin, where ε corresponds to Chahar *i*.

Complete assimilation of initial \**i* to the vowel of the following syllable has taken place in some words in all the other modern Mongolic languages as well, but

<sup>11</sup> For sources, see App. J, 10.7.3, p. 229.

the number of words which have undergone this process varies a lot from language to language. The development of \**i* before different vowels is summarized in (21).

(21) *Reflexes of \*i before different vowels in the second syllable*

*Vowel in the second syllable*

	*Ø/i	*a/aha	*u/uhu	*ahu	*e/ehe/ihe	*y	*o
Hlh	i	a	ʊ	ʊ	i	u	ɔ
Cha	i	a, i	ʊ	ʊ	i	u	(ɔ)
Baa	i	a, ε	ʊ	ʊ	i	u	(ɔ)
Bur	e	a, i	ʊ	ʊ	e	u	ɔ
Kmn	i	i	(ʊ)	i	i	i	(ɔ)
Klm	i	a, i	u	o	i	y	o
Dag	i	a, i		ɔ	i	u	
ShY	y	a			e		(v)
Mgr	i	i	i		i		
San	i	i	u		i	u	
Bon	i	i, a			i		(i)
KJ	i	i		(i)	i	i	
Mog	i				i	u	(i)

Examples (see 9.13): \*/i/: see (3); \*/a/: \*čikasun, \*čita, \*kʰilpar, \*mikʰan, \*sira; \*/aha/: \*imahan; \*/u/: \*čʰisun, \*kʰimusun; \*/uhu/: \*niruhun; \*/ahu/: \*čʰilahun, \*sipahun; \*/e/: \*hičʰe, \*ire, \*ite; \*/ehe/: \*inehe; \*/ihe/: \*sirihe; \*/y/: \*čiryken, \*nityn, \*sityn; \*/o/: \*čʰino, \*siŋkʰor.

Assimilation is common in Buriad, but some initial *i* remain in pharyngeal words, for example, *xʰizar* ‘border’, *xʰilbər* ‘easy’, *nʰilxə* ‘baby’ (Halh *xʰacgar* хязгаар, *xʰačprər* хялбар, *nʰačx* нялх). Assimilation occurs only in a few words in Kamnigan and Moghol, and initial \**i* is often retained in Santa, Monguor, Bonan, and Kangjia as well.

There are also some cases of progressive assimilation of \**i* in non-initial syllables (see Poppe 1963).

#### 10.7.4 *Breaking of word-initial \*i*

When a word-initial \**i* (i.e. one that was not preceded by a consonant) was assimilated to a back vowel, the result is the onset *j* plus the assimilated vowel in Halh and some other dialects of Mongolian proper, as well as in Buriad, Oirad, and sometimes Dagur. For example, OM \*imahan ‘goat’ became *jama* in Halh (ямаа), Cha-har, and Baarin, *jaman* in Buriad and Kalmuck. Another example is OM \*ilka ‘to separate’ > Halh *jačəg* ялга. There was a similar development for the initial group \**hi*: OM \*hiruhar ‘bottom’, \*hiryher ‘blessing’ became *jɔrɔč* ёроол, *joroč* ёроөл in Halh and *joral*, *jorel* in Kalmuck.

### 10.7.5 *Breaking of \*u in Dagur*

The normal Dagur reflex of Old Mongolian *\*u* is *ɔ*, but when it was followed by an *\*a* in the next syllable it is often, but not always, assimilated to this vowel, and the preceding consonant is labialized (or a *w* appears if *\*u* is word-initial). Examples are *t<sup>w</sup>ant* ‘middle’, *k<sup>w</sup>arpə* ‘three’, *wantʰ* ‘to sleep’ (OM *\*tumta*, *\*kurpan*, *\*untʰa*). The same development took place with *\*o* in some words as well (e.g. in *walən* ‘many’, OM *\*olan*). In some Dagur words, *\*y* was broken to *wv*, for example, OM *\*yile* > *wvil* ‘deed’ and OM *\*yje* > *wyj* ‘joint’ (see Poppe 1930a: 110; 1955: 31; Todaeva 1986: 11f.; Janhunen 1990b; Kuribayashi 1993). This process is analogous to *\*i*-assimilation and consonant palatalization (“*\*i*-breaking”) in Halkh, and is connected with the development of a series of labialized consonant phonemes in Dagur, unique for a Mongolic language.

## 10.8 ONSET CONSONANTS

In this section we describe the development of the Old Mongolian consonants in syllable onset position. Coda consonants are treated in section 10.9. The development of the consonants is also affected by deaspiration (10.10) and palatalization (10.11). A summary of the development of the onset consonants in environments without palatalization or deaspiration is given in (22).

### (22) *Development of onset consonants*

The velar and uvular allophones of *\*k/* and *\*kʰ/* are shown separately. A slash separates reflexes in word-initial/word-medial position. The consonants *\*m*, *\*n*, *\*r*, *\*j*, which remain unchanged in all modern languages, are not shown in the table.

OM	<i>*t<sup>h</sup></i>	<i>*č<sup>h</sup></i>	<i>*[k<sup>h</sup>]</i>	<i>*[q<sup>h</sup>]</i>	<i>*p</i>	<i>*t</i>	<i>*č</i>	<i>*[k]</i>	<i>*[q]</i>	<i>*s</i>	<i>*h</i>	<i>*l</i>
Hlh	<i>t<sup>h</sup></i>	<i>c<sup>h</sup></i>	x	x	p/w	t	c	g	g	s	Ø	ł
Cha	<i>t<sup>h</sup></i>	<i>č<sup>h</sup></i>	x	x	p	t	č	k	k	s	Ø	l
Baa	<i>t<sup>h</sup></i>	<i>č<sup>h</sup></i>	x	x	p	t	č	k	k	s	Ø	l
Bur	<i>t<sup>h</sup></i>	s	x	x	b	d	z	g	g	h	Ø	l
Kmn	<i>t<sup>h</sup></i>	<i>c<sup>h</sup></i>	<i>k<sup>h</sup></i>	<i>k<sup>h</sup></i>	p	t	c	k	k	h	Ø	l
Klm	<i>t<sup>h</sup></i>	<i>č<sup>h</sup></i>	<i>k<sup>h</sup></i>	x	b/w	d	z	g	g	s	Ø	l
Dag	<i>t<sup>h</sup></i>	<i>č<sup>h</sup></i>	<i>k<sup>h</sup></i> , x/k	x/k	p/w	t	č	k	k	s	x/Ø	l
ShY	<i>t<sup>h</sup></i>	<i>č<sup>h</sup></i>	<i>k<sup>h</sup></i>	<i>x/k<sup>h</sup></i>	p/w	t	č	k	k	s	h/Ø	l
Mgr	<i>t<sup>h</sup></i>	<i>č<sup>h</sup></i>	<i>k<sup>h</sup></i>	x	p/w	t	č	k	q	s	x/Ø	l
San	<i>t<sup>h</sup></i>	<i>č<sup>h</sup></i>	<i>k<sup>h</sup></i>	<i>q<sup>h</sup>, q/q</i>	p/w	t	č	<i>k/q</i>	<i>q<sup>h</sup>, q/q</i>	s	x/Ø	l
Bon	<i>t<sup>h</sup></i>	<i>č<sup>h</sup></i>	<i>k<sup>h</sup></i>	x, <i>q/q</i>	w, p	t	č	k	x, <i>q/q</i>	s	h/Ø	l
KJ	<i>t<sup>h</sup></i>	<i>č<sup>h</sup></i>	<i>k<sup>h</sup></i>	<i>x/k</i>	p/w	t	č	k	x, <i>k/k</i>	s	h/Ø	l
Mog	t	č	k	q	b	d	ž	g	g	s	Ø	l

Examples (9.13): \*/tʰ/: \*tʰapun, \*tʰani, \*tʰaulai, \*altʰan, \*ertʰe, \*umartʰa; \*/čʰ/: \*čʰak, \*čʰakanah, \*čʰerik, \*kakčʰa, \*kʰakačʰa, \*ničʰykyn; \*/kʰ/ [kʰ]: \*kʰelen, \*kʰen, \*kʰøl, \*kʰyr, \*hykʰer, \*nekʰe, \*nekʰei, \*nøkʰer, \*ykʰy; \*/kʰ/ [qʰ]: \*kʰalahun, \*kʰara, \*kʰonin, \*kʰuruhun, \*akʰa, \*mikʰan, \*nokʰai; \*/p/: \*pahu, \*pari, \*peri, \*epesyn, \*sipar, \*tʰapun; \*/t/: \*tahun, \*tehere, \*tørpen, \*mete, \*nityn, \*sityn; \*/č/: \*čahu, \*čahun, \*čaru, \*kačar, \*yče, \*yčyhyr; \*/k/ [k]: \*kem, \*ker, \*kerel, \*køre-hesyn, \*hyneken, \*ønteken, \*øjke; \*k [q]: \*kačar, \*kal, \*kar, \*kurpan, \*čikasun, \*čʰakanah, \*mokai; \*/s/: \*sahu, \*sain, \*sara, \*čʰasun, \*jasun, \*usun; \*/h/: \*harpan, \*hulahan, \*hynesyn, \*ahula, \*čahu, \*tehere; \*/m/: \*mete, \*morin, \*motun, \*emys, \*aman, \*naiman; \*/n/: \*nahat, \*narin, \*nokʰai, \*ene, \*hyneken, \*inehe; \*/l/: \*hulahan, \*kʰalahun, \*kʰelen; \*/r/: \*ire, \*kʰara, \*sira; \*/j/: \*japu, \*jasun, \*josun, \*huja, \*pajan, \*peje, \*yje.

### 10.8.1 Stops

According to our reconstruction, Old Mongolian had two series of stops and affricates, voiceless aspirated and voiceless unaspirated. The Old Mongolian aspirated ~ unaspirated contrast is retained as such in most modern languages. It was replaced by a voiceless ~ voiced contrast in Moghol, and the unaspirated stops seem to have become voiced in Buriad and Oirad. The velar/uvular stops often became fricativized.

In Halh, \*p was retained word-initially and after \*l, \*m, and \*p (which became ʂ, m, w in Halh). In other positions, it was fricativized to w. Similar developments took place in Oirad, Dagur, Shira Yugur, Monguor, Santa, Bonan, and Kangjia (Cengeltei 1988; Qasbagan-a 2000a).

The dental stops are retained in all modern languages.

The Old Mongolian velar stops \*kʰ, \*k had the uvular allophones \*[qʰ], \*[q] in back-vocalic words (see 8.6.2). The velar and uvular allophones are kept phonetically distinct in all modern languages, and their phonemic status depends on the development of the vowel system. Generally speaking, they became contrasting phonemes in those languages where back and front vowels merged (\*y > u, \*ø > o), but remained allophones in the others, where the Old Mongolian seven-vowel system is kept structurally intact. The situation can be illustrated by comparing Moghol with Mongolian proper (23). Although the reflexes of \*[kʰ] and \*[qʰ] are retained as velar and uvular consonants in both languages, the vowel merger in Moghol made the uvulars and velars contrast, but they remained allophones conditioned by the pharyngeality of the following vowel in Mongolian.

(23)		'far'	'foot'	'finger'	'to reach'
Old Mongolian	*kʰola	*kʰøl	*kʰuruhun	*kʰyr	
allophones	[qʰola]	[kʰøl]	[qʰuruhun]	[kʰyr]	
Moghol	qolo	kol	qurun	kur	
Halh	xɔł [χɔł]	xoł [xøł]	xuru [χuru]	xur [xur]	
	хол	хөл	хүрүү	хүр	

Although those languages which have not merged front and back rounded vowels usually retain the velars and uvulars as allophones, the situation is complicated by fricativization, which affected most modern languages (Buraev 1977), and created different reflexes for \*[k<sup>h</sup>] and \*[q<sup>h</sup>] in Oirad and several other modern languages. The pattern of mergers is complicated and differs from language to language; see (24) for an overview.

(24) *Mergers of velar and uvular stops*

A slash separates reflexes in word-initial/word-medial position.

OM	*[k <sup>h</sup> ]	*[q <sup>h</sup> ]	*[q]	*[k]
Cha, Baa	x		k	
Bur	x		g	
Kmn	k <sup>h</sup>		k	
Hlh	x		g	g
Dag	k <sup>h</sup> , x/k	x/k		k
ShY	k <sup>h</sup>	x/k <sup>h</sup>		k
Klm	k <sup>h</sup>	x	g	g
Mgr	k <sup>h</sup>	x	q	k
Mog	k	q	g	g
KJ	k <sup>h</sup>	x, k/k		k
San	k <sup>h</sup>	q <sup>h</sup> , q/q		k/q
Bon	k <sup>h</sup>	x, q/q		k

The original state with an aspirated and an unaspirated stop, which have velar and uvular allophones, is retained in Kamnigan. Mongolian and Buriad retained the system, but changed the aspirated stop to a fricative *x* (with the uvular allophone [χ] in pharyngeal words). In Halkh, the unaspirated stop \**k* became voiced. In originally front-vocalic words it became velar *g* and in originally back-vocalic words it became uvular *g*. The picture is, however, complicated by the fact that syllable-final \**k* developed to *g* both in front- and back-vocalic words, making velars and uvulars contrast in pharyngeal words in Halkh after short word-final vowels were deleted (see (34) below).

In Oirad, \**k<sup>h</sup>* became a fricative *x* only in back-vocalic words, and it remained a stop in front-vocalic words. In words where a vowel has been palatalized (10.11.2), fricativization took place before palatalization, so that *k<sup>h</sup>* and *x* may contrast (25).

(25)	'far'	'foot'	'sheep'	'back'
Old Mongolian	*k <sup>h</sup> ola	*k <sup>h</sup> øl	*k <sup>h</sup> oni/n	*k <sup>h</sup> oina
allophones	[q <sup>h</sup> ola]	[k <sup>h</sup> øl]	[q <sup>h</sup> oni]	[q <sup>h</sup> oina]
fricativization	xola	—	xoni	xoina
vowel palatalization	—	—	xøni	xøøna
vowel deletion	xol	k <sup>h</sup> øl	xøn	xøøn
Kalmuck	xol	k <sup>h</sup> øl	xøn	xøøn

In medial position, all uvular/velar stops merged to [y] in Dagur, analysed as an allophone of /k/ by us. Santa, Bonan, and Kangjia merged \**[q<sup>b</sup>]* and \**[q]*, but there was a split, so that the reflex is either *q<sup>h</sup>*, *x*, *x* in the three languages (26a), or *q*, *q*, *k* [*q*] (b). What caused this split is not known. The stops are realized as fricatives in word-medial position.

(26)	<i>Old Mongolian</i>	<i>Santa</i>	<i>Bonan</i>	<i>Kangjia</i>
(a)	* <i>k<sup>b</sup></i> ara * <i>k<sup>b</sup></i> alahun *kar *kal	'black' 'warm' 'hand' 'fire'	<i>q<sup>b</sup></i> ara <i>q<sup>b</sup></i> aluŋ <i>q<sup>b</sup></i> a <i>q<sup>b</sup></i> aq	xara xoloŋ xar xar
(b)	* <i>k<sup>b</sup></i> ojar * <i>k<sup>b</sup></i> uruhun *kačar *kurpan	'two' 'finger' 'ground' 'three'	qua quru qača quranj	koar koru kačar korɔ

### 10.8.2 Affricates<sup>12</sup>

The Old Mongolian affricates \*č and \*č<sup>h</sup> are retained as alveopalatal affricates in most modern languages, but they were affected by two phonological processes, fricativization and depalatalization, in Oirad, Buriad, and Mongolian. Fricativization changed the affricates to the corresponding fricatives, and depalatalization made the alveopalatal affricates dental except before \*i. Different dialects underwent these processes to different extents. Halk has no fricativization but depalatalization, with the result that \*č and \*č<sup>h</sup> were retained only before \*i. In other positions, they became dental *c* and *c<sup>h</sup>*. This process together with \*i-assimilation created a contrast between alveopalatal and dental affricates:

(27)		'hundred'	'spear'	'time'	'to boil'
Old Mongolian	*čahu/n	*čita	*čhak	*čhina	
depalatalization	cahu	—	c <sup>h</sup> ak	—	
*i-assimilation	—	čata	—	č <sup>h</sup> ana	
segmental changes	cuu	—	c <sup>h</sup> ag	—	
short vowel deletion	—	čat	—	č <sup>h</sup> an	
Halk	cuu зуу	čat жад	c <sup>h</sup> ag цаг	č <sup>h</sup> an чана	

In Kalmuck, the reflexes of \*č, \*č<sup>h</sup> are č, č<sup>h</sup> before \*i (which is retained as *i*), and *c*, *c<sup>h</sup>* elsewhere. This can be analysed as phonemes /č/ and /č<sup>h</sup>/, with the palatalized allophones [č] and [č<sup>h</sup>] before *i*. All affricates were fricativized in Buriad, and there is fricativization of \*č<sup>h</sup>, but not of \*č, in the Horchin dialect of Mongolian (Bosson and Unnesečen 1962).

Different Oirad dialects differ with respect to depalatalization and fricativization. In Kalmuck and in Xinjiang Torgoood, only \*č was fricativized, becoming *z* except before \*i. Alshaa (Cogtu 1985) and Hoshuud has depalatalization but no fricativi-

<sup>12</sup> Todaeva (1960a); Cengeltei (1979b); Clark (1979); Rassadin (1981); Gantogtoh (1982); Badg-aev (1987; 1988a, b; 1989a, b, c; 1990).

zation, the result being the same as in Halh. According to Kara (1958), *z* and *c* alternate in Oirad of Western Mongolia. The situation is summarized in (28).

(28) *Development of Old Mongolian affricates*

A slash separates reflexes before \**i* and in other positions

	depalatalization	fricativization of *čʰ	fricativization of *č
Buriad	+	+ š/s	+ ž/z
Bargu	+	+ š/s	- č/c
Kalmuck	+	- čʰ/cʰ	-/+ ž/z
Torguud	+	- čʰ/cʰ	-/+ č/z
Halh, Alshaa, Hoshuud	+	- čʰ/cʰ	- č/c
Kamnigan	+	- cʰ [čʰ/cʰ]	- c [č/c]
Horchin	-	+ š	- č
Other languages	-	- čʰ	- č

These developments are exemplified in (29) with examples from our standard sources, or Sun et al. (1990).

(29)		'stone'	'time'	'spear'	'to bite'
	Old Mongolian	*čʰilahun	*čʰak	*čita	*čahu
	Buriad	šulun	sag	žadə	zuu
	Bargu	šulu	sak	čat	cuu
	Kalmuck	čʰolun	cʰag	jid	zu
	Torguud (Xinjiang)	čʰolun	čʰak	čit	zuu
	Halh	čʰulgu чулгуу	cʰag паг	čat жад	cuu зүү
	Alshaa	čʰulu	cʰak	čit	cuu
	Hoshuud (Qinghai)	čʰulu	cʰak	čet	cuu
	Kamnigan	cʰilč [čʰilč]	cʰak [čʰak]	cita [čita]	cč [cč]
	Horchin	šulu	šak	čet	čuu
	Chahar	čʰulu	čʰak	čit	čuu
	Baarin	čʰulu	čʰak	čet	čuu

There is a fair number of words where especially \*č but also \*čʰ were depalatalized in Halh, Buriad, and Kalmuck even when they occurred before Old Mongolian \**i* (30). Presumably, \**i*-assimilation took place before depalatalization in such words. (See also 10.11.1 for consonants that fail to palatalize under similar conditions.)

(30)	OM	Halh	Buriad	Kalmuck
	*čiha	'to point'	caa	zaa
	*čikasun	'fish'	cagəs	zagəhən
	*čirkohan	'six'	curga	zurgan
	*kʰečije	'when'	xice	xeze
	*čʰisun	'blood'	cʰos	šuhən
	*čečike	'father'	icʰəg	ecʰkʰ

10.8.3 Fricatives<sup>13</sup>

Old Mongolian \*/s/ had the allophones \*[š] before \*i and \*[s] in other positions. This pattern is usually preserved in the modern languages, in the sense that \*[š] occurs before reflexes of Old Mongolian \*i, and \*[s] occurs elsewhere. The allophone \*[š] became phonemic by \*i-assimilation in all modern languages except Kamnigan; examples (see 9.13) are: \*sihe, \*sini, \*sira, \*sityn, \*masi, \*kasihun. The development is exemplified in (31) with the Old Mongolian pair \*sara ‘moon’ ~ \*sira ‘yellow’, which became sar ~ šar in Mongolian, Oirad, and Dagur (31).

(31)	Old Mongolian	*sara ‘moon’	*sira ‘yellow’
	allophonic variation	—	[šira]
	*i-assimilation	—	šara
	deletion of short vowels	sar	šar
	Halh	sar cap	šar map

There is a special development in Buriad, where \*s is weakened to h except before \*i. For example, the words ‘moon’ and ‘yellow’ are *hara* ~ *šarə* in Buriad. The same development took place in (Urul’ga) Kamnigan. Since \*i is normally not assimilated in Kamnigan, š occurs only before i and can be regarded as an allophone of h; the two above-mentioned words are *hara* ~ *hira* [šira] in Kamnigan. The sibilant s was reintroduced in Buriad by fricativization of čh, creating a contrast between h, s and š (32).

(32)		‘moon’	‘yellow’	‘time’	‘to boil’
	Old Mongolian	*sara	*sira	*čhak	*čhina
	allophonic variation	—	[šira]	—	—
	depalatalization	—	—	čhak	—
	*i-assimilation	—	šara	—	čhana
	sibilant weakening	hara	—	—	—
	fricativization	—	—	sak	šana
	other segmental changes	harə	šarə	sag	šanə
	Buriad	harə	šarə	sag	šanə

In some areas of the Jalaid dialect as well as in Gorlos, and in the language of the mongolized Dörbed of Heilongjiang province, \*s became t<sup>h</sup> (except before \*i): \*sahu > t<sup>h</sup>vu ‘to sit’, \*sehyl > t<sup>h</sup>uuł ‘tail’, \*usun > vt<sup>h</sup> ‘water’ (Rudnev 1911: 180f.; Ramstedt 1957: 70; Bao Xianglin 1985; Zhang and Shaobu 1990; Böke 1994; Chen 1995b: 664f.). This development took place in some Eastern Buriad dialects as well (Rassadin 1982: 80; Darbeeva 1996: 84).

Initial \*h disappeared in Mongolian, Buriad, Kamnigan, Oirad, Moghol, and Hailar Dagur, but is retained in the other Mongolic languages. Its reflex is h in Shira Yugur and Bonan, x in Buthaa Dagur, Santa, Monguor, and Kangjia (in some of these languages with the allophone [f] before rounded vowels). It is palatalized to š before \*i in Santa, Monguor, Bonan, and Kangjia (see \*hičhē in 9.13 for an example).

<sup>13</sup> Clark (1979); Boosiyang (1981); Badgaev and Omakaeva (1986); Buraev (1988a, b).

Non-initial *\*h* disappeared in all modern languages, normally causing the surrounding vowels to coalesce to one long vowel; see section 10.3.

#### 10.8.4 *Sonorants*

The Old Mongolian sonorants, that is, the nasals *\*m* and *\*n*, the liquids *\*l* and *\*r*, and the glide *\*j* (Ramstedt 1915), are very stable in syllable onset position and are normally retained unchanged in all modern Mongolic languages. Groups of the form *\*ijV* became long vowels (10.3).

The change of phonetic realization from *\*l* to *ł* seems to be unique for Halkh. Its exact distribution in the Halkh dialects is not known. As far as we know, it did not take place in other Mongolian dialects, nor in other Mongolic languages.

## 10.9 CODA CONSONANTS

As seen in section 8.7.4, only the unaspirated voiceless stops, the fricative *\*s*, and the sonorants occur as codas. The only Old Mongolian consonant that can be a coda but not an onset is the velar nasal *\*ŋ*. The nasal *\*n* and the liquids *\*l* and *\*r* are much more frequent than other codas.

The development of the Old Mongolian syllable codas is summarized in (33). Although the individual coda consonants were fairly stable in most languages, the system of coda consonants changed considerably from Old Mongolian to most modern languages, in particular Mongolian proper, due to changes of the word and syllable structure (see 10.12).

### (33) *Development of coda consonants*

N = nasal whose place of articulation is assimilated to a following obstruent.

OM	<i>*p</i>	<i>*t</i>	<i>*[k]</i>	<i>*[q]</i>	<i>*s</i>	<i>*m</i>	<i>*n</i>	<i>*ŋ</i>	<i>*N</i>	<i>*l</i>	<i>*r</i>
Hlh	w	t	g	g	s	m, N	ŋ	ŋ	N	ł	r
Cha	p	t	k	k	s	m, N	ŋ	ŋ	N	ł	r
Baa	p	(t)	k	k	s	m, N	n	ŋ	N	ł	r
Bur	b	d	g	g	d	m, N	n	n	n	ł	r
Kmn	p	t	k	k	t	(m)	n		N	ł	r
Klm	w	d	g	g	s	m	n	ŋ	N	ł	r
Dag	u	(t)	(k)	r	s	(m)	n	(n)	n	ł	r
ShY	p	t	k	k	s	m	n	ŋ	ŋ	ł	r
Mgr	p	(t)	q	q	s	m	n	ŋ	N	ł	r, š
San	Ø	(Ø, t)	Ø	Ø	s	(n, ŋ)	ŋ	ŋ	N	ŋ, n	Ø
Bon	p	(Ø, t)	(k,x)	q	š	m	ŋ	(ŋ)	m	ł	r
KJ		(Ø, t)	u		s	n	(ɔ)		N	r	r
Mog	(b)	(t)	(g)		s		n			ł	r

Examples are (see 9.13): \*/p/: \*ap, \*čop, \*napčin; \*/t/: \*khitat, \*morit, \*nahat, \*setkhil; \*/k/ [k]: \*čeček, \*čherik, \*øk, \*picħik; \*/kl/ [ql]: \*alak, \*čak, \*pulak; \*/sl/: \*emys, \*nis, \*pos; \*/m/: \*kem, \*sam, \*ertem, \*khamtħu, \*nimken, \*tumta; \*/n/: \*čakahan, \*hulahan, \*khalahun, \*kħen; \*/ŋ/: \*tokħalaj, \*tyhyrey, \*maylai; \*/N/: \*kħynty, \*ontekeñ, \*ynty, \*kħoñken, \*øjke; \*/l/: \*čil, \*kal, \*kħøl, \*alħan, \*čalki; \*/rl/: \*kačar, \*kar, \*ytyr, \*ertħe, \*kurpan, \*tørpen, \*umartħa.

Unaspirated voiceless \*p, \*t, \*k are the only stops that occur in Old Mongolian syllable codas. In most modern languages they developed in the same way as in onset position, but there are a few special developments. In Halh, coda \*p became w, as did onset \*p in word-medial position. In Santa, all coda stops were deleted, and in Dagur, \*k > r in a number of words (cf. Todaeva 1986: 33ff.; Šerbak 1992–3).

In Halh, coda \*k became g in both non-pharyngeal and pharyngeal words, while onset \*k became g in non-pharyngeal words and ɣ in pharyngeal words. Combined with deletion of short non-initial vowels, this led to a contrast between velar g and uvular ɣ in pharyngeal, but not in non-pharyngeal words (34) (see also 3.2.2). A similar development took place in Kalmuck, where the words exemplified in (34) are arg, alg, yg, øg.

(34) Old Mongolian	*arka	*alak	*yke	*øk
	'method'	'motley'	'word'	'to give'
allophones	[arpa]	[alaq]	[yke]	[øk]
velarization of coda *[q]	—	alak	—	—
other segmental changes	arga	alag	uge	og
vowel deletion	arg	aħg	ug	—
vowel epenthesis	arəg	aħəg	—	—
Halh surface form	arəg apra	aħəg alaq	ug yg	og ør

Old Mongolian coda \*s became d in Buriad, t in (Urul'ga) Kamnigan, and š in Bonan, but is retained in the other languages. Santa does not have s in syllable codas, but retains Old Mongolian coda \*s by adding a vowel after it.

The liquids \*l and \*r are usually retained in coda position, except in Santa, where \*l became a nasal and \*r was deleted. In Kangjia and in Minhe Monguor (Jagnasutu and Li 1982), \*l and \*r merged to r.

In Huzhu Monguor, coda \*r developed to š before \*tħ: OM \*umartħa > muštaa 'to forget'; \*ertħe > šte 'early'; \*urtħu > štur 'long'. This suggests that OM \*tħ was preaspirated, devoicing the preceding \*r (see also 10.10 below).

In Mongolian, Oirad, Dagur, and Shira Yugur, coda \*l disappeared before \*s (Poppe 1954b); see the examples \*mølsyn 'ice' and \*čħahalsun 'paper' (Halh mos moc, čħaas nnaac) in 9.13. If the \*l is not in coda position but separated from the \*s by a vowel, it does not disappear: \*kħølesyn 'sweat', Halh xoħs xølc.

There were three coda nasals in Old Mongolian, \*m, \*n and \*ŋ. In word-medial position, \*n and \*ŋ did not occur before non-homorganic stops, but \*m did. In the modern languages, there is a tendency for \*m to assimilate to the place of articulation of a following obstruent. All three nasals occur in word-final position. Word-final \*m is retained except in Santa and Kangjia, but merger of \*n and \*ŋ has taken

place in word-final position in many modern languages, including Hалх and Буряад. Eastern Mongolian (including Баянчин, Ордос, Оирад, and Шира-Үгүр) have kept final \**n* and \**y* apart, however (35) (see also Булчилагу 1960; 1998; Боке 1985; Лутайжигал 1990; Пэлжий 1992).

(35) *Word final \*n and \*y*

OM	*k <sup>h</sup> alahun	‘warm’	*tyhyren	‘full’
Hlh	xažun	халуун	tuurəŋ	дүүрэн
Bur	xalun		duurən	
Baa	xalun		tuurəŋ	
Klm	xalun		dyyrəŋ	
ShY	xaluon		tyreŋ	

The contrast was reintroduced in Hалх by the deletion of final short vowels:

(36)	Old Mongolian	*k <sup>h</sup> en	‘who’	*ene	‘this’
	velarization of <i>n</i>	k <sup>h</sup> en		—	
	final vowel deletion	—		en	
	other changes	xiŋ		in	
	Hалх	xiŋ xən		in ənə	

### 10.9.1 *Unstable \*n*

Many Old Mongolian nouns had a vacillation between a subject form ending with \**n* (e.g. \*čʰisun ‘blood’) and a form without \**n* (\*čʰisu) used as an indefinite object. In Hалх, this \**n* was usually lost in the nominative (*cʰus* цус ‘blood’), accusative (*cʰusig* цусыг), instrumental (*cʰusar* цусаар), and comitative (*cʰustʰai* цустай) while it is retained in the genitive (*cʰusni* цусны), dative (*cʰusənt* цусанд), and ablative (*cʰusnas* цуснаас).

Adjectives normally retain final \**n* (which became *y* in Hалх, e.g. \*nokahan > nɔgɔŋ ногоон ‘green’), as do attributive nouns (*cʰusəŋ* цусан ‘blood-’). Monosyllabic nouns (e.g. \*hon > ɔŋ он ‘year’) and a few others, such as \*økʰin > øjəŋ охин ‘girl’, have also retained \**n*. In many modern languages, analogy has created apparent reflexes of \**n* in words where Old Mongolian did not have it. The different modern languages have dealt with unstable \**n* in different ways, but since this primarily is a morphosyntactic and semantic problem and not a phonological one, we will not go into it further. Many examples can be found in the comparative vocabulary (9.13).

## 10.10 DEASPIRATION AND RELATED PROCESSES<sup>14</sup>

Some Mongolic languages have eliminated the occurrence of two aspirated consonants in a word by deaspirating one of them in a way similar to Grassmann’s

<sup>14</sup> For sources, see App. J, 10.10, p. 229.

(1863) law in Indo-European. In addition to the aspirated stops and affricates ( $*t^h$ ,  $*k^h$ ,  $*č^h$ ), the voiceless fricative  $*s$  also triggers deaspiration (although it is not changed by it).

In all dialects of Mongolian proper, except Northern Halkh and Eastern Mongolian, an initial aspirated stop or affricate ( $*t^h$ ,  $*č^h$ ,  $*k^h$ ) became unaspirated if the following syllable onset is an aspirated stop or affricate, or the voiceless fricative  $*s$ . Mongolian deaspiration is exemplified in (37a) with Chahar; the same pattern occurs, for example, in Ordos (Sun et al. 1990) and Naiman (Mönggönerel 1998). Standard Halkh forms are given for comparison. There is no deaspiration if the two aspirated consonants are separated by more than a short vowel (37b); note that  $x$  is the regular reflex of  $*k^h$ . This suggests that Old Mongolian had preaspiration, similar to that in Halkh, making it difficult to realize both post- and preaspiration with devoicing of both the initial and the final part of one short vowel in words such as  $*/t^h\text{at}^h\text{a}/ [t^h\text{a}^h\text{ta}]$ , while a longer distance gives more space for the realization of two consecutive aspirations (see Svantesson 2003a). The deaspirating effect of  $*s$  can be related to the fact that [s] is aspirated and may devoice the final part of the preceding vowel in Halkh (see 2.2).

Although Ulaanbaatar Halkh does not have phonological deaspiration, postaspiration is significantly shorter for initial aspirated stops in those positions where Chahar and other dialects have deaspiration, as was pointed out already by Ramstedt (1902: 12f.). Our measurements (Karlsson and Svantesson 2002) showed that Halkh postaspiration (VOT) is only about two-thirds of its normal value in these positions.

(37) *Deaspiration in Mongolian dialects*

	OM	Chahar	Halkh
(a) ‘to pull’	$*t^h\text{at}^h\text{a}$	<i>tat<sup>h</sup></i>	$t^h\text{at}^h$
‘fat’	$*t^h\text{osun}$	<i>tɔs</i>	$t^h\text{ɔs}$
‘ear’	$*č^h\text{ik}^h\text{in}$	<i>čix</i>	$č^h\text{ix}$
‘blood’	$*č^h\text{isun}$	<i>čus</i>	$č^h\text{us}$
‘China’	$*k^h\text{i}t^h\text{at}$	<i>kɪt<sup>h</sup>at</i>	$x^h\text{at}^h\text{ət}$
‘blue’	$*k^h\text{o}k^h\text{e}$	<i>kox</i>	<i>xox</i>
(b) ‘paper’	$*č^h\text{ahalsun}$	<i>č̊aas</i>	<i>č̊aas</i>
‘old’	$*k^h\text{auč}^h\text{in}$	<i>xuuč̊əŋ</i>	<i>xuuč̊əŋ</i>
‘cold’	$*k^h\text{oit}^h\text{en}$	<i>xiit̊əŋ</i>	<i>xuit̊əŋ</i>
‘sweat’	$*k^h\text{olesyn}$	<i>xols</i>	<i>xołs</i>
‘together’	$*k^h\text{amt}^h\text{u}$	<i>xamt<sup>h</sup></i>	<i>xamt<sup>h</sup></i>

In Monguor, the second of two aspirated consonants is deaspirated (38a). Here as well,  $*s$ , and also  $*h$ , trigger deaspiration (b). This kind of dissimilation also takes place in Santa and Bonan, although not as regularly as in Monguor, and in a few words in Kangjia and Shira Yugur. (Words with deaspiration are italicized.)

## (38) Monguor type deaspiration

	OM	Mgr	Santa	Bonan	Kangjia	ShY
(a) 'to pull'	*t <sup>h</sup> at <sup>h</sup> a	t <sup>h</sup> ita	sta	šta	st <sup>h</sup> a	ht <sup>h</sup> a
'together'	*k <sup>h</sup> amt <sup>h</sup> u	xamti	xant <sup>h</sup> u	hamtu		xamty
'China'	*k <sup>h</sup> it <sup>h</sup> at	č <sup>h</sup> itar	q <sup>h</sup> utei	hti	xthe	k <sup>h</sup> ut <sup>h</sup> at
'to bark'	*k <sup>h</sup> uč <sup>h</sup> a	xoča	q <sup>h</sup> uča	hča	k <sup>h</sup> uč <sup>h</sup> a	k <sup>h</sup> uč <sup>h</sup> a
'old'	*k <sup>h</sup> auc <sup>h</sup> in	xaučin	q <sup>h</sup> uaič <sup>h</sup> en	xiičaj	xuaič <sup>h</sup> ɔ	xuuč <sup>h</sup> yn
'ear'	*č <sup>h</sup> ik <sup>h</sup> in	č <sup>h</sup> iki	č <sup>h</sup> iqen	č <sup>h</sup> ixaŋ	č <sup>h</sup> ixɔ	č <sup>h</sup> k <sup>h</sup> yn
'blue'	*k <sup>h</sup> ok <sup>h</sup> e	k <sup>h</sup> uko	k <sup>h</sup> ukie	k <sup>h</sup> uko	k <sup>h</sup> uk <sup>h</sup> u	hk <sup>h</sup> ø
(b) 'axe'	*syk <sup>h</sup> e	suko	sukie	ške	suku	suk <sup>h</sup> e
'to guard'	*sak <sup>h</sup> i	ski	saqi	saaqa	saxi	saaky
'be ashamed'	*hič <sup>h</sup> e	ščee	šiče	šče	šči	hč <sup>h</sup> e
'ox'	*hyk <sup>h</sup> er	xukor	xukie	ok <sup>h</sup> or		hkor

A similar process is 'aspiration flip-flop', which occurs regularly in Monguor. This process converts an unaspirated–aspirated consonant sequence to an aspirated–unaspirated sequence (39). In this case as well, the spreading of preaspiration through a vowel is a possible explanation. For example, preaspiration of the second consonant in \*/tot<sup>h</sup>ara/ \*[to<sup>h</sup>tara], realized as devoicing of the final part of the vowel, may have spread through the vowel and been reinterpreted as postaspiration of the initial consonant, \*[t<sup>h</sup>otara]. At least in one word (39b), \*[q] followed by \*s does not have the expected reflex q in Monguor, but appears as x, as if it were the reflex of \*[q<sup>h</sup>].

## (39) Aspiration flip-flop

	OM	Monguor	Santa	Bonan	Kangjia	Sh. Yugur
(a) 'inside'	*tot <sup>h</sup> ara	t <sup>h</sup> utor	sutoro			ht <sup>h</sup> ɔr
'forty'	*t <sup>h</sup> č <sup>h</sup> in	t <sup>h</sup> ičin				t <sup>h</sup> č <sup>h</sup> yn
'pig'	*kak <sup>h</sup> ai	xqai	q <sup>h</sup> wqeи	qaqui	kvakai	kak <sup>h</sup> ai
'to fit'	*čok <sup>h</sup> i	č <sup>h</sup> uqu		čoqui	čuku	č <sup>h</sup> ky
(b) 'bitter'	*kasihun	xašin	q <sup>h</sup> wušun	qašonj	kaši	kašoun

This process created an aspirated stop phoneme *p<sup>h</sup>* in some words in Monguor (40), and also in Santa, Bonan, Kangjia, and Shira Yugur, where aspiration flip-flop usually does not take place. This was also triggered by \*s in several words (40b). It seems that aspiration of the initial \*p is not triggered if the distance between it and the causing consonant is more than one short vowel (40c).

## (40) Aspiration of \*p

	OM	Monguor	Santa	Bonan	Kangjia	Sh. Yugur
(a) 'firm'	*pat <sup>h</sup> u	p <sup>h</sup> ati	p <sup>h</sup> utu	pat <sup>h</sup> uu		pat <sup>h</sup>
'to write'	*pič <sup>h</sup> i	p <sup>h</sup> uči	p <sup>h</sup> iči	p <sup>h</sup> uč <sup>h</sup> i	p <sup>h</sup> yč <sup>h</sup> i	p <sup>h</sup> yč <sup>h</sup> y

	OM	Monguor	Santa	Bonan	Kangjia	Sh. Yugur
(b) 'also'	*pasa		<i>p<sup>h</sup>ese</i>	sa		<i>p<sup>h</sup>ysa</i>
	*pos	posi	posu	oš	pəsu	<i>p<sup>h</sup>ɔs</i>
	*pyse	<i>p<sup>h</sup>usee</i>	<i>p<sup>h</sup>isie</i>	se	<i>p<sup>h</sup>use</i>	<i>p<sup>h</sup>ysi</i>
(c) 'tiger'	*pars	pas	pasu	pasu	pasu	parys
	*pōhesyn	poosi	posu	poosoj	posun	pyisvn

In some words with initial vowel, aspiration apparently moved from a medial consonant to the beginning of a word as in flip-flop, but since there was no initial consonant, the moved aspiration appears as an initial consonant *h* or *x* (cf. Helimskij 1984). In this way, what looks like spurious reflexes of initial \**h* were created (41). There are, however, some words where there is no apparent source for this spurious \**h* (41b).

(41) *Aspiration reinterpreted as initial \*h*

	OM	Monguor	Santa	Bonan	Kangjia	Sh. Yugur
(a) 'to die'	*yk <sup>h</sup> y	xuku	xuku	<i>hku</i>	ku	<i>hk<sup>h</sup>u</i>
	*alt <sup>h</sup> an	<i>xaltan</i>	ant <sup>h</sup> an	alt <sup>h</sup> an	ant <sup>h</sup> ɔ	alt <sup>h</sup> an
	*ert <sup>h</sup> e	še	et <sup>h</sup> ie	ert <sup>h</sup> e	et <sup>h</sup> e	<i>hyrt<sup>h</sup>e</i>
	*urt <sup>h</sup> u	štur	xutu	štur	št <u>u</u>	<i>hurt<sup>h</sup>u</i>
	*øk <sup>h</sup> in	ščun	ot <sup>h</sup> in	ok <sup>h</sup> uŋ		<i>hk<sup>h</sup>on</i>
	*jek <sup>h</sup> e	ške	xukie	ško		<i>šik<sup>h</sup>e</i>
	*unu	xuni	unu	<i>honu</i>	one	<i>hɔny</i>
(b) 'to ride'	*inehe	šinee	sinie	šine	šine	<i>hnii</i>
	*inehe	šinee	sinie	šine	šine	

## 10.11 PALATALIZATION

The Old Mongolian vowel \**i* had a palatalizing effect on some of the preceding consonants in all Mongolic languages. In Halkh and several other dialects of Mongolian proper, a series of palatalized consonant phonemes developed when the \**i* which conditioned palatalization disappeared by vowel reduction or by \**i*-assimilation, and similar developments took place in Buriad, Oirad, and Dagur. Similarly, the palatalizing effect of \**i* on a preceding vowel created new vowel phonemes in Oirad and in some Mongolian dialects.

### 10.11.1 Consonant palatalization<sup>15</sup>

Palatalized consonant phonemes occur only in pharyngeal words in Halkh, where they developed due to the influence of a following \**i*. In initial syllables, all \**i* were eliminated from pharyngeal words by \**i*-assimilation (10.7.3), and in non-initial syllables, all short vowels, including \**i*, were deleted from the phonological rep-

<sup>15</sup> Bitkeev (1975b); see also the literature referred to in 10.7.3.

resentation (10.5.1). The conditioning environments disappeared in both cases so that palatalized and plain consonants became contrastive:

(42)		'easy'	'black'	'to guard'	'beard'
Old Mongolian	*k <sup>h</sup> ilpar	*k <sup>h</sup> aara	*sak <sup>h</sup> i	*sak <sup>h</sup> al	
palatalization	[k <sup>h</sup> ilpar]	—	[sak <sup>h</sup> i]	—	
*i-assimilation	k <sup>h</sup> alpar	—	—	—	
vowel deletion	k <sup>h</sup> alpr	k <sup>h</sup> ar	sak <sup>h</sup>	sak <sup>h</sup> l	
segmental changes	x <sup>j</sup> al <sup>h</sup> pr	xar	sax <sup>j</sup>	sax <sup>h</sup> z	
vowel epenthesis	x <sup>j</sup> al <sup>h</sup> pər	—	—	saxəz	
Halh	x <sup>j</sup> al <sup>h</sup> pər	xar	sax <sup>j</sup>	saxəz	
	хялбар	хар	сахъ	сахал	

The Old Mongolian consonants \*k<sup>h</sup>, \*p, \*k, \*m, \*n, \*l, \*r were palatalized to Halh x<sup>j</sup>, p<sup>j(wj)</sup>, g<sup>j</sup>, m<sup>j</sup>, n<sup>j</sup>, ʂ<sup>j</sup>, r<sup>j</sup> in these environments. The consonants \*s, \*h, \*č, \*č<sup>h</sup> also developed in different ways depending on whether or not they preceded \*i (see 10.8.2–3), but \*t and \*t<sup>h</sup> never preceded \*i in Old Mongolian.

Similar developments took place in other dialects of Mongolian, and also in Buriad and Dagur. In Kalmuck, only the dentals \*l, \*n were palatalized. According to Bitkeev (1965), they became pure palatals, but we will write them as l<sup>j</sup>, n<sup>j</sup>. Examples of palatalization in these languages are given in (43).

#### (43) Consonant palatalization

	OM	Halh	Chahar	Buriad	Kalmuck	Dagur
*p 'cheese'	*pisilak	p <sup>j</sup> asłeg	бяслаг			
'fifty'	*thapin	thaw <sup>j</sup>	тавъ	t <sup>h</sup> ep <sup>j</sup>	t <sup>h</sup> ab <sup>j</sup> ən	t <sup>h</sup> ewn
*k 'to swallow'	*čalki	całg <sup>j</sup>	залпи	čel <sup>j</sup> k	zal <sup>j</sup> g	čelk <sup>j</sup>
*k <sup>h</sup> 'border'	*k <sup>h</sup> ičahar	x <sup>j</sup> acgar	хязгаар		x <sup>j</sup> izar	k <sup>h</sup> izer
'nail'	*k <sup>h</sup> imusun	xums	хумс	xoms	x <sup>j</sup> umhən	xumsn
'to offer'	*thak <sup>h</sup> i	t <sup>h</sup> ax <sup>j</sup>	таксъ		t <sup>h</sup> ax <sup>j</sup> ə	t <sup>h</sup> ek <sup>h</sup>
'hen'	*thak <sup>h</sup> iija	t <sup>h</sup> ax <sup>j</sup> a	таксиа	tex <sup>j</sup> a	t <sup>h</sup> ax <sup>j</sup> a	t <sup>h</sup> ak <sup>ha</sup>
*m 'thousand'	*mijk <sup>h</sup> an	m <sup>j</sup> ang	мянга	m <sup>j</sup> ik	m <sup>j</sup> angən	m <sup>j</sup> angn
'meat'	*mik <sup>h</sup> an	max	мах	max	m <sup>j</sup> axən	m <sup>j</sup> ak
'life'	*amin	am <sup>j</sup>	амъ	em <sup>j</sup>	am <sup>j</sup> ən	am <sup>j</sup>
*n 'baby'	*nilk <sup>h</sup> a	n <sup>j</sup> algx	нялх	nlx	n <sup>j</sup> ilxə	nilx
'to hide'	*nihu	nuu	нуу	nuu	n <sup>j</sup> uu	nu
'to recognize'	*thani	t <sup>h</sup> an <sup>j</sup>	танъ	t <sup>h</sup> en <sup>j</sup>	t <sup>h</sup> an <sup>j</sup> ə	t <sup>h</sup> an <sup>j</sup>
*l 'which'	*ali	al <sup>j</sup>	аль	el <sup>j</sup>	al <sup>j</sup> ən	al <sup>j</sup>
'fruit'	*alima	al <sup>j</sup> əm	алим	el <sup>j</sup> əm	al <sup>j</sup> me	al <sup>j</sup> mn
*r 'to hold'	*pari	par <sup>j</sup>	баръ	per <sup>j</sup>	bar <sup>j</sup> ə	ber
'horse'	*morin	mɔr <sup>j</sup>	моръ	mɔr <sup>j</sup>	mɔrn	mɔr <sup>j</sup>

There is no palatalization of initial consonants in Chahar, and palatalization took place in Halh only when the assimilating vowel was \*a, and never when it was \*u or \*o, as illustrated in (43). Palatalization of initial consonants is more common in Buriad, where it occurs before u (< \*u) as well, as in n<sup>j</sup>uu 'to hide' in (43), and even in non-pharyngeal words (Zolhoev 1973b); compare, for example, Buriad

*njudən* ‘eye’ and *unjen* ‘cow’ (OM \**nityn*, \**ynijen*) with Halkh *nut* нүд, *une* үнээ. Some pharyngeal words in Buriad retain *i* in the initial syllable (e.g. *xjizar* ‘border’); since all consonants became palatalized before *i* (Soktoeva 1988), there is no palatalized ~ plain contrast in this position.

There are some words where expected palatalization does not take place in Halkh, for example, *max max* ‘meat’, OM \**mik<sup>h</sup>an* (cf. Buriad *m<sup>j</sup>axən*). These irregularities have no obvious explanation. Apparently, \**i*-assimilation took place in several waves, so that for instance the word \**mik<sup>h</sup>an* ‘meat’ assimilated its \**i* before palatalization had taken place in Halkh, while words as \**mijk<sup>h</sup>an* ‘thousand’ did not assimilate \**i* until after palatalization (44). Two or even three different ‘breakings’, possibly combined with a change of the vowel from non-palatalizing \**u* to palatalizing \**i* (cf. 8.6.4), were assumed by Vladimirov (1929: 176ff.), Sanžeev (1953: 104ff.), Janhunen (1990b), and others. This does not really solve the problem of why the initial consonant was palatalized in certain words but not in others, however.

(44)	Old Mongolian	* <i>mik<sup>h</sup>an</i> ‘meat’	* <i>mijk<sup>h</sup>an</i> ‘thousand’
	* <i>i</i> -assimilation (1)	<i>mak<sup>h</sup>an</i>	—
	palatalization	—	[ <i>m<sup>j</sup>ijk<sup>h</sup>an</i> ]
	* <i>i</i> -assimilation (2)	—	<i>m<sup>j</sup>anj<sup>h</sup>an</i>
	other changes	<i>max</i>	<i>m<sup>j</sup>ang</i>
	Halkh	<i>max max</i>	<i>m<sup>j</sup>ang</i> мянга

Word-final consonants were often palatalized in Dagur, even when they did not occur before \**i*. For example, OM \**k<sup>h</sup>øl* ‘foot’, \**k<sup>h</sup>elen* ‘tongue’, \**kar* ‘hand’ became Dagur *k<sup>h</sup>ul<sup>j</sup>*, *xyl<sup>j</sup>*, *kar<sup>j</sup>* (cf. Poppe 1955: 59). There was a special development in Monguor, where \**k<sup>h</sup>* often became *č<sup>h</sup>* before \**i*: OM \**k<sup>h</sup>imusun* ‘nail’ > Mgr *č<sup>h</sup>imsi*, \**øk<sup>h</sup>in* ‘girl’ > *ščun* (cf. Badgaev 1989c).

### 10.11.2 Vowel palatalization<sup>16</sup>

Eastern Mongolian dialects have no palatalized consonant phonemes. Instead, palatalized vowel phonemes developed when a word with an originally back vowel (\**a*, \**o*, \**u*) had an \**i* in the following syllable. It seems that the development took place in four steps: (i) \**i* palatalized the preceding consonant; (ii) palatalized consonant phonemes were created by loss of final vowels; (iii) the palatalized consonant made the preceding vowel palatal; and (iv) consonant palatalization was lost, making the palatalized vowel phonemic. Halkh went through the first two steps (and also the third step on the phonetic level (see 1.3)), and Baarin went through all four (45).

<sup>16</sup> Ramstedt (1932); Rudnev (1911: 188); Cenggeltei (1959); Bayancogtu (1962); Bosson and Unensečen (1962); Pavlov (1963a); Tömörčerèn (1969b); Rassadin (1982: 116ff.); Togog-a (1983a); Kögiltü (1984; 1986a); Kuribayashi (1985a); Sun et al. (1990); Kim Chu-wǒn (1998; 1999b); Gereltü (1999).

(45)	Old Mongolian	*ama/n ‘mouth’	*ami/n ‘life’
(i)	consonant palatalization	—	[am <sup>j</sup> i]
(ii)	deletion of short vowels	am	am <sup>j</sup>
Halh		am am	am <sup>j</sup> амъ
(iii)	vowel palatalization	—	[ɛm <sup>j</sup> ]
(iv)	loss of consonant palatalization	—	em
Baarin		am	em

A similar development took place in Oirad (including Kalmuck). Examples are given in (46), where Chahar and Halh forms are given for comparison.

(46) *Vowel palatalization*

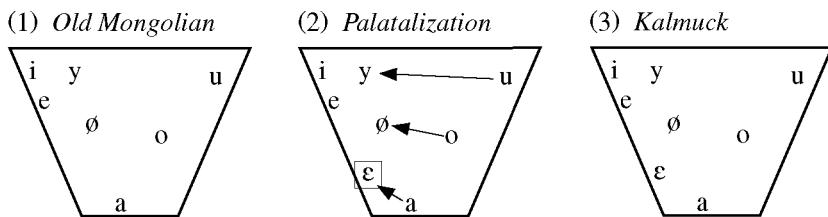
		OM	Baarin	Kalmuck	Chahar	Halh
*a	‘life’	*amin	ɛm	ɛmn	ɛm <sup>j</sup>	am <sup>j</sup> амъ
	‘to return’	*k <sup>b</sup> ari	xər	xər	xər <sup>j</sup>	xar <sup>j</sup> харь
	‘fifty’	*t <sup>h</sup> apin	t <sup>h</sup> ep	t <sup>h</sup> ewn	t <sup>h</sup> ep <sup>j</sup>	t <sup>h</sup> aw <sup>j</sup> тавъ
	‘which’	*ali	ɛl	al <sup>j</sup>	ɛl <sup>j</sup>	al <sup>j</sup> аль
	‘to recognize’	*t <sup>h</sup> ani	t <sup>h</sup> en	t <sup>h</sup> an <sup>j</sup>	t <sup>h</sup> en <sup>j</sup>	t <sup>h</sup> an <sup>j</sup> танъ
*o	‘sheep’	*k <sup>b</sup> onin	xœn	xœn	xœn <sup>j</sup>	xœn <sup>j</sup> хонъ
	‘horse’	*morin	mœr	mœrn	mœr <sup>j</sup>	mœr <sup>j</sup> моръ
*u	‘to summon’	*uri	yṛ	yṛ	yṛ <sup>j</sup>	yṛ <sup>j</sup> уръ
	‘destiny’	*k <sup>b</sup> upi	xœp	xyw	xyp <sup>j</sup>	xuw <sup>j</sup> хувъ

Since Kalmuck did not undergo any vowel shift, the original back vowels \*a, \*o, \*u were not changed before they were palatalized by a following \*i, becoming ε, φ, y. The vowels φ and y merged with the unchanged reflexes of Old Mongolian \*φ and \*y (e.g. OM \*mφr ‘path’ > mφr, \*yče ‘to see’ > yz) so the resulting vowel system has eight vowels. This is illustrated in Figure 10.3a. Kalmuck has only two palatalized consonant phonemes, n<sup>j</sup> and l<sup>j</sup> (and the marginal d<sup>j</sup>, t<sup>jh</sup>). Vowel palatalization usually took place only before non-dental consonants which have no corresponding palatalized consonant.

In Baarin, Old Mongolian \*a was palatalized to ε as in Kalmuck, but the Mongolian vowel shift changed \*o, \*u to ɔ, ʊ before they were palatalized, so that their palatalized reflexes are œ, y (Figure 10.3b). Unlike in Kalmuck, the palatalized vowels did not merge with any existing vowels, so three new vowel phonemes were created. The vowel y was added to the system by monophthongization of the diphthongs \*φi and \*yi (10.4).

The Chahar dialect is analysed in different ways by different authors. Dobo (1983a) describes Shuluun Höh Chahar as having palatalized consonants as well as vowels. He writes the words ‘life’ and ‘mouth’ as em<sup>j</sup> and am. From the data given by Dobo, it seems that palatalized short vowels in initial syllables occur only before palatalized consonants, as in Halh. There is one difference from Halh, however: the diphthongs \*ai, \*oi developed to monophthongs εε, œœ (shortened in non-initial syllables) in Chahar, but are retained as ai, oi in Halh. This is an independent

## (a) Kalmuck



## (b) Baarin

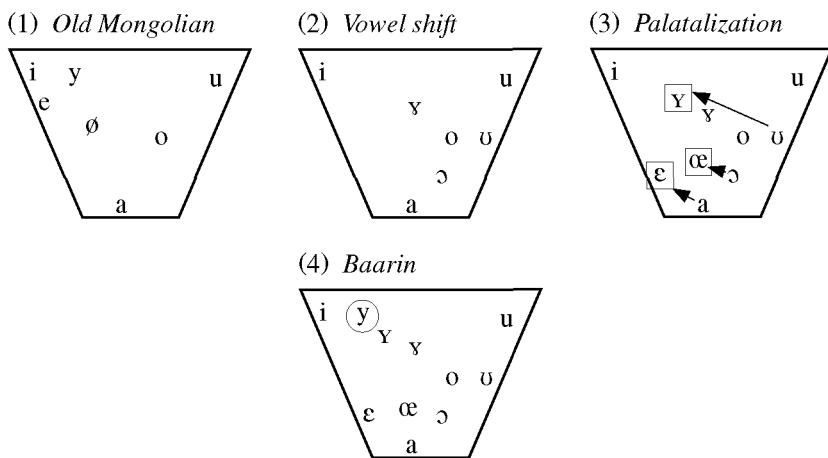


FIGURE 10.3 Vowel palatalization

reason to assume vowel phonemes /ɛ/, /œ/ in Chahar (but not in Halh), and the [ɛ] in [em<sup>j</sup>] and [œ] in [mœr<sup>j</sup>] must belong to these phonemes.

Sun et al. (1990) do not write palatalized consonants word-finally for Shuluun Höh Chahar (so that ‘life’ ~ ‘mouth’ are *em* ~ *am*), but they write palatalized consonants in other positions (e.g. *un<sup>j</sup>y* ‘cow’, *ul<sup>j</sup>as* ‘aspen’). Under both analyses, it is necessary to assume the existence of palatalized vowels as well as consonants. We will follow Dobo.

10.11.3 *Vowel palatalization and vowel harmony*<sup>17</sup>

Although palatalization restructured the vowel systems of both Eastern Mongolian and Oirad, it had quite different consequences for vowel harmony in these two languages, here exemplified with Baarin and Kalmuck.

<sup>17</sup> Poppe (1965: 184); Vago (1973).

Using the vowel features introduced in section 5.1, palatalization can be regarded as an addition of the feature [palatal] (47). The main acoustic effect is to increase F2.

- (47) *u* [R] > *y* [PR]  
*a* [FO] > *ɛ* [PFO]  
*o* [OR] > *ø* [POR]  
*ʊ* [FR] > *ʏ* [PFR]  
*ɔ* [FOR] > *œ* [PFOR]

In Baarin, vowel harmony is based on the feature [pharyngeal], and vowel palatalization did not change the harmony class of the vowels, because this feature is not involved (48).

- (48) *Baarin vowel palatalization and vowel harmony*

- |                |                       |   |                 |                       |
|----------------|-----------------------|---|-----------------|-----------------------|
| <i>a</i> [FO]  | <i>pharyngeal</i>     | → | <i>ɛ</i> [PFO]  | <i>pharyngeal</i>     |
| <i>ɔ</i> [FOR] | <i>pharyngeal</i>     | → | <i>œ</i> [PFOR] | <i>pharyngeal</i>     |
| <i>ʊ</i> [FR]  | <i>pharyngeal</i>     | → | <i>ʏ</i> [PFR]  | <i>pharyngeal</i>     |
| <i>u</i> [R]   | <i>non-pharyngeal</i> | → | <i>y</i> [PR]   | <i>non-pharyngeal</i> |

In Kalmuck, vowel harmony is based on palatality, and palatalization changed the harmony class of a non-palatal vowel to palatal (49).

- (49) *Kalmuck vowel palatalization and vowel harmony*

- |               |                    |   |                |                |
|---------------|--------------------|---|----------------|----------------|
| <i>a</i> [FO] | <i>non-palatal</i> | → | <i>ɛ</i> [PFO] | <i>palatal</i> |
| <i>o</i> [OR] | <i>non-palatal</i> | → | <i>ø</i> [POR] | <i>palatal</i> |
| <i>u</i> [R]  | <i>non-palatal</i> | → | <i>y</i> [PR]  | <i>palatal</i> |

Thus, palatalization changed the vowel harmony class of words with original back vowels in Kalmuck, but not in Baarin. This is illustrated in (50) with the instrumental suffix, *-er/ar* in Kalmuck and *-yr/or/ar/ɔr* in Baarin; for verbs, the direct past (Kalmuck *-le/la*; Baarin *-ly/lo/la/lɔ*) is used. Halh forms are given for comparison. The words in (50a), which had front vowels in Old Mongolian, take non-pharyngeal suffixes in Baarin and Halh, and front-vocalic suffixes in Kalmuck. Those in (b) and (c) are originally back-vocalic, and take pharyngeal suffixes in Baarin and Halh. They take back-vocalic suffixes in Kalmuck (b), but if the stem vowel has been fronted (c), the word changed its harmony class and takes front-vocalic suffixes.

- (50) OM Kalmuck Baarin Halh

(a)	<i>front vowel</i>				
	*ker ‘house’	ger-er	kvr-vr	gir-er	гэрээр
	*mør ‘path’	mør-er	mor-or	mor-or	мөрөөр
	*yke ‘word’	yg-er	uk-vr	ug-er	үгээр
(b)	<i>back vowel</i>				
	*aman ‘mouth’	am-ar	am-ar	am-ar	амаар
	*motun ‘tree’	mod-ar	möt-ɔr	möt-ɔr	модоор
	*sur ‘to learn’	sur-la	sur-la	sur-ʒa	сурлаа

	OM	Kalmuck	Baarin	Halh
(c)	<i>fronted back vowel</i>			
	*amin ‘life’	em–er	em–ar	am <sup>j</sup> –ar амиар
	*morin ‘horse’	mør–er	mør–or	mør <sup>j</sup> –or мориор
	*uri ‘invite’	yr–le	yr–la	ur <sup>j</sup> –la урълаа

As seen in section 10.4, \*-i-diphthongs usually developed to front monophthongic vowels in Southern and Eastern Mongolian (including Baarin and Chahar), as well as in Oirad (including Kalmuck). In these languages, but not in Halh (1.3), long vowels (from OM \*VhV combinations) which were followed by \*i in the next syllable merged with the reflexes of \*-i-diphthongs. Words whose vowels became fronted by monophthongization of \*-i-diphthongs (51a) or by palatalization of long vowels (51b), changed their harmony class in Kalmuck (Bitkeev 1968) but not in Baarin or other dialects of Mongolian proper.

(51)	OM	Kalmuck	Baarin	Halh
(a)	*k <sup>h</sup> aič <sup>h</sup> i ‘scissors’	xεeč <sup>h</sup> –er	xεeč <sup>h</sup> –ar	xaič <sup>h</sup> –ar хайчаар
	*oira ‘near’	øør–er	œœr–or	ɔir–or ойроор
	*k <sup>h</sup> ui ‘sheath’	xyy–ger	xyy–kar	xoi–gar хуйгаар
(b)	*tahari ‘sore’	deer–er	teer–ar	taar <sup>j</sup> –ar даариар
	*sahurin ‘base’	syyr–er	syyr–ar	suor <sup>j</sup> –ar сууриар

## 10.12 SYLLABLE AND WORD STRUCTURE<sup>18</sup>

As seen in Chapter 8 and in section 6.1, syllable structure was much simpler in Old Mongolian than in Halh. At the same time, the number of syllables and phonemes per word decreased considerably from Old Mongolian to Halh, as is shown in Figure 10.4, which is based on the 254 uninflected Old Mongolian words given in section 8.9 and their Halh cognates. This figure shows the number of words with a given number of syllables (1–4; top panel) or a given number of speech sounds, including Halh schwas (1–9; bottom panel). The average number of syllables per word decreased from 2.2 in Old Mongolian to 1.4 in Halh. Two-thirds of the words were disyllabic in Old Mongolian, but two-thirds are monosyllabic in Halh. Thus there is a clear tendency towards monosyllabic stems in Halh. There is a similar decrease in the number of speech sounds per word, from 4.8 in Old Mongolian to 3.5 in Halh.

The decrease of the number of syllables per word is accompanied by a corresponding increase of the number of possible syllables (52). The maximal syllable was CVC in Old Mongolian but is CVCCC in Halh. Furthermore, the number of different consonants has increased, and the number of consonants which are possible codas has increased as well. The number of possible consonants in a syllable

<sup>18</sup> Tömörčerèn (1970); Galsan (1976); Sun (1981); Tömörtogoo (1987b, c; 1992: 176ff.); Kuribayashi (1988; 1992); Qaserdeni (1995); Norjin (1998).

differs depending on the vowel harmony class of its vowel nucleus, and this was taken into account when the number of possible syllables was calculated.

(52) *Possible number of phonemes and phoneme combinations in different positions*

	Old Mongolian	Halh
Onset	16	23
Vowel nucleus	13	17
Coda	9	27
Complex codas	—	157
Number of possible syllables	1,872	50,328

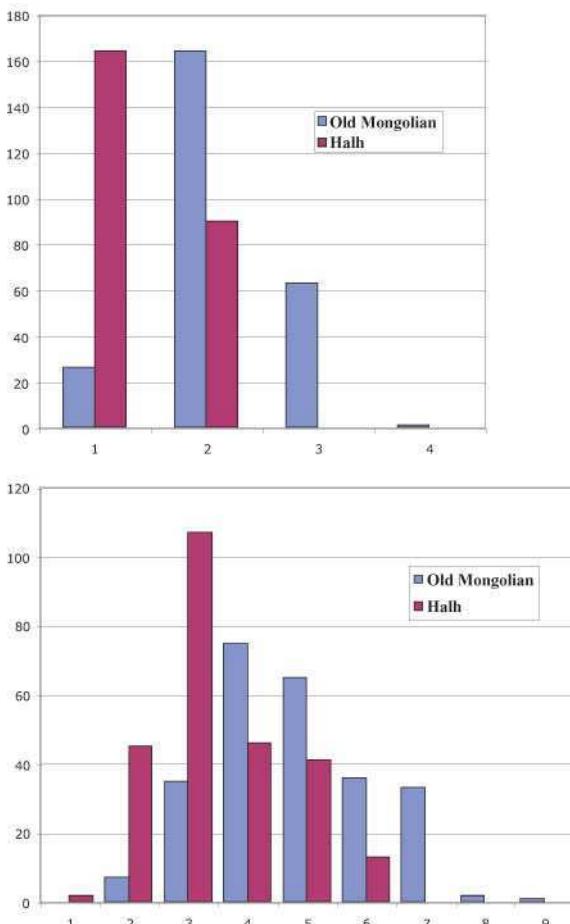


FIGURE 10.4 Number of syllables (top) and speech sounds (bottom) per word in Old Mongolian and Halh

The lower number of syllables per word is mainly due to the larger set of different phonemes, and less to the existence of more complex syllables. The increase of the number of phonemes and the decrease of the number of syllables per word are mainly the consequences of two processes: the development of long vowels in connection with loss of \**h*, and deletion of short non-initial vowels. Vowel deletion also increased the number of consonants which are possible in coda position, since several consonants which did not occur in syllable codas in Old Mongolian were transferred from onset to coda position in the resyllabification that was a consequence of vowel deletion. In Halkh, these include č, c, j and the reflexes of aspirated consonants (*t<sup>h</sup>*, *c<sup>h</sup>*, *č<sup>h</sup>*, *x*). Examples are OM \**khačhi* > *xaičh* хайч ‘scissors’; \**peje* > *pij* бые ‘body’; \**huhut<sup>h</sup>a* > *vut<sup>h</sup>yyt* ‘bag’; \**k<sup>h</sup>øk<sup>h</sup>e* > *xox* xox ‘blue’. Furthermore, consonant palatalization created a number of new phonemes, which can occupy the coda (as well as the onset) position: \**k<sup>h</sup>onin* > *xɔn<sup>j</sup>* хонь; ‘sheep’; \**masi* > *maš* маш ‘very’; \**pari* > *par<sup>j</sup>* барь ‘to hold’, etc. Similar developments took place in other dialects of Mongolian proper, in Dagur, and in Oirad.

It is interesting to note that although Mongolian is typologically very different from the isolating tone languages spoken in East and South-east Asia (Sino-Tibetan, Kadai, Hmong-Mien, and some branches of Austroasiatic), it shows the same tendency to pack more and more information into each syllable which is typical for the South-east Asian linguistic area (see Svantesson 1988c).

### 10.13 CONCLUSION

The development of Mongolian proper, Oirad, and Buriad is more regular, and easier to describe, than the development of the other, ‘peripheral’ languages, which have been geographically isolated. This might indicate that Mongolian, Buriad, and Oirad are direct descendants of Old Mongolian, and that the peripheral languages are rather its sister languages. On the other hand, the peripheral languages have developed independently, in contact with Chinese, Tibetan, or Persian, and also without the stabilizing influence of the Mongolian written language. These facts may explain their more complicated linguistic history. It should also be noted that the peripheral languages have not been described in great detail, and that the available sources for them vary somewhat, sometimes due to dialect differences, but sometimes possibly due to different analyses by different investigators.

There is no generally accepted classification of the Mongolic languages into subgroups. Binnick (1987) and Rybatzki (2003) discuss this problem at some length. At least sixteen different classification schemes have been proposed: Rudnev (1908), Vladimirov (1929), Nomura (1940), Poppe (1955), Poppe (1960a; 1965), Doerfer (1964a), Bertagaev (1968b), Beffa and Hamayon (1983), Yu Shichang (1983), Cenggeltei (1989a), Binnick (1992), Jahontova (1997a), Nugteren (1997), Secencogtu (1999), Svantesson (2000), and Rybatzki (2003). One reason for this diversity is that the sets of languages for which different innovations have occurred often overlap, and furthermore it is difficult to sort out which innovations

are genetic and which are areal. Thus the choice of criteria affects the classification to a relatively high degree.

One might ask if it is at all meaningful to attempt a genetic classification of a group like the Mongolic languages, with a complicated history of language contacts, using standard criteria such as shared innovations. In an article devoted to Mongolic classification, Binnick (1987: 194) says that ‘. . . no simple *Stammbaum* can do justice to Mongolian linguistic history’. In our opinion, a definitive classification of the Mongolic languages must wait at least until all Mongolic languages have been studied thoroughly and a reliable reconstruction of Proto-Mongolic exists. Even then it can be doubted if a family tree model is appropriate; perhaps the ‘punctuated equilibrium’ model proposed by Dixon (1997) is more suitable for the Mongolic languages where relatively long periods when closely related languages and dialects have been in constant contact resulting in linguistic convergence have been interrupted by short periods with rapid demographic and linguistic change.

# APPENDICES

The appendices contain notes and details on the literature and sources used in the relevant sections.

## Appendix A – Introduction

Additional literature on Mongolian and its phonology, and Mongolian speech processing

*General descriptions of Mongolian and its phonology:* Abel-Rémusat (1820); Schmidt (1831); A. I. Bobrovnikov (1835); Kowalewski (1835); A. A. Bobrovnikov (1849); Grunzel (1895); Kotwicz (1902); Ramstedt (1902); Rudnev (1905); Öyabu (1920); Haenisch (1925); Whymant (1926); Vladimircov (1929); Poppe (1936; 1937; 1951a; 1954a; 1970); Takeuchi (1937); Kojima (1938); Hattori (1943); Hambis (1946); Todaeva (1951); Sanžeev (1959; 1964b); Luvsanvandan (1961a; 1964b; 1966c; 1967; 1975b; 1985); Vanduj (1961; 1970); Cenggeltei (1963; 1979a); Street (1963); Dobo (1964; 1983a); Posch (1964a); Rinčen (1966; 1979); Coloo (1967b; 1976); Qagancilagu (1970); Sühbaatar (1970); Beffa and Hamayon (1975); Hagiwara (1975); Möömöö (1977; 1979; 1997); Bayancogtu (1978); Nasumbayar et al. (1982); Jin (1983); Delige’erma (1987); Nadeljaev (1987); Sanžaa (1990; 1998); Nadmid and Sanžaa (1993); Qaserdeni et al. (1996); Sun (1996b); Jahontova (1997b); Orlovskaja (1997); Svantesson (2003b). See Chapter 9 for descriptions of other Mongolic languages.

*Mongolian speech processing:* Dawa, Ôkawa, and Shirai (1996; 1999a, b, c, d; 2001a, b); Dawa et al. (1997; 1998; 1999; 2000); Köke, Bao, and Coyijongjab (1997); Bao Huaiqiao and Chen (1998); Köke et al. (1998); Dawa, Shirai, and Ôkawa (2000); Köke, Chen, and Zheng (2001); Dawa and Shirai (2003); Köke (2003a); Radnaeva (2003).

## Appendix B – Chapter 1

1.1 *Acoustic properties of monophthongs. Duration:* Sanžeev (1978); Bayancogtu (1982a); Rialland and Djamouri (1984); Köke (1997; 2001; 2003a). *Formant frequencies:* Obata and Teshima (1934; 1935); Jôo (1971; 1973a; 1975; 1976b; 1997); Rialland and Djamouri (1984); Svantesson (1985; 1995b); Coyijongjab (1989b); Coyijongjab and Jôo (1993); Bayarmendü (1997c; 1998a, b); Franzén and Svantesson (1999); Köke (1999b; 2003a); Franzén (2001). See the literature cited in section 3.1.1 for reduced vowels. *Intrinsic pitch:* Köke (1999c; 2003a).

The Mongolian vowels given here as [u, ø/o, ʊ, ɔ] are often transcribed as ü, ö, u, o (e.g. by Poppe 1951a), which corresponds to their (reconstructed) pronunciation in Old Mongolian ([y, ø, u, o] in IPA symbols). In theoretical discussions,

especially of vowel harmony, Mongolists have used the terms ‘front vowels’ for the two first ones and ‘back vowels’ for the two last ones (e.g. Vladimircov 1929: 115; Poppe 1951a: 15). Their more detailed descriptions of vowel qualities show that they were aware of the phonetic incorrectness of this, and the use of this terminology may be due to the historical bias in Mongolian studies, or to the lack of an alternative terminology. This practice has been unfortunate since non-Mongolists have ignored the detailed descriptions and assumed that the vowel symbols denote phonetically front and back vowels.

According to Kim Chu-wǒn (1997), sixteenth-century Korean sources transcribe Mongolian [ʊ] and [ɔ] with Korean ㅗ [o]. A. I. Bobrovnikov (1835) says that the Mongolian letters 𢂑 (i.e. [ɔ, u]) and 𢂒 [u, o] are similar to Russian [o] and [u], respectively, and that each Mongolian letter represents two sounds, one of which is ‘milder’ (*něžněe*) than the corresponding Russian sound. A. A. Bobrovnikov (1849) says that Mongolian *ii* (our [u]) is almost like Russian [u], and *u* (our [ʊ]) is between Russian [u] and [o]. Edkins (1871: 212) says that the vowels written by Schmidt (1831) as *o, u, ö, ii* (our [ɔ, u, ø/o, u]) are rather *ö, o, o, u~ii*; he states that Schmidt’s *o* and *u* are like *o* in *fond* and *o* in *bone*, and that *ii* varies between *oo* in *tool* and French *u*; he describes the difference between *u* and *ö* as one of pitch, the former having lower pitch. Vitale and Sercey (1897) say that there is no *ö* or *ii* in Halkh. Ramstedt (1902) writes the main allophones of the four rounded vowels (our [u, ø/o, u, ɔ]) as *u, ü, ყ, o* and uses the then current term ‘mixed’ (i.e. central) for the two first ones; he describes some of their allophones as front. He says that *ყ* is a sound intermediate between [u] and [o]. Poppe (1951a) follows Ramstedt’s description. Rudnev (1905) says that he was advised by the Iranist Carl Salemann to use the Cyrillic based letters э, ю (for our [u, ø/o]) in order to distinguish them from *ii*, *ö*, which are not found in Halkh. He further says (p. 7) that э and ю are similar to Russian [u] and that ѕ and љ are similar to Russian [o]. Cybikov (1915: 1–2) says that [our [ʊ]] is pronounced as [u] with the tongue pulled backwards (*s ottjagivaniem jazyka nazad*). Kamiyama (1919) uses the symbols *i, è* (i.e. [v]), *ü, ö, a, o, u* and says that *u* and *o* are pronounced ‘making an effort in the throat’ (喉に力ヲ入レテ *nodo ni chikara o irete*). Vladimircov (1929: 57) uses the Cyrillic based letters э, ю, ѕ, љ (for our [u, ø/o, u, ɔ]) and the terms central series (*srednij rjad*) and back series (*zadnij rjad*). He says (p. 159) that Mongolian *u* is intermediate between [u] and [o]. Obata and Teshima (1934) say that *ii* (our [u]) is similar to [u]. Hattori (1936; 1937a) says that *ii, ö, u, o* (our [u, ø/o, u, ɔ]) are pronounced as *u, ö, o, ɔ* in the spoken language. Kojima (1938) says that *u* (our [ʊ]) is between [u] and [o]. Sanžeev (1941) describes Buriad э, ю as central (*srednij*), but uses the terms front ~ back (*perednj ~ zadnj*) when analysing vowel harmony. Aberle and Austin (1951) say that Chahar *ii* (our [u]) is a back vowel and *ö* (our [ø/o]) is a central vowel. Cenggeltei and Sinedke (1959) use the IPA symbols *u, o, ɔ* [equivalent to *u, ɔ*] for the rounded vowels.

**1.1.1 The phonetic basis for vowel harmony.** A. I. Bobrovnikov (1835) and Kljukin (1926) use the terms loud (*gromkij*) and soft (*tihij*) for the vowel harmony classes, corresponding to the Mongolian traditional terms *er-e* ‘male’ and *em-e*

'female'. Adam (1874) uses the terms strong ~ weak (*forte* ~ *faible*). Orlov (1878) uses the terms loud (*gromkij*) and dull (*gluhoj*). The terms hard (series) (*tverdyj* (*rjad*)) and soft (series) (*mjakkij* (*rjad*)) are used by many Russian and Soviet authors in descriptions of Mongolian and Buriad: A. A. Bobrovnikov (1849: 6); Cybikov (1908); Rudnev (1913–14); Nadeljaev (1957); Buraev (1959; 1960; 1985a; 1986). According to Buraev, the soft series vowels are characterized by raising of the central part of the tongue blade. The terms pharyngeal ~ palatal are used by Grunzel (1888) (*guttural* ~ *palatal*); Rudnev (1905; 1913–14) and Cybikov (1908: 2) (*gortannyyj* ~ *nebnyj*); Vladimircov (1929: 115) (*guttural'nyj* ~ *palatal'nyj*); Abematsu (1936) and Kojima (1938) (喉音 *kōon* ~ 口蓋音 *kōgaion*). Some authors use the terms back ~ front for modern Mongolian or Buriad: Vladimircov (1929) and Sanžeev (1941) (*zadnij* ~ *perednij*); Poppe (1951a: 20 (*hintere* ~ *vordere*); 1970); Todaeva (1951) (*zadnij* ~ *perednij*); Street (1963). The traditional terms *cingg-a* ~ *kön-dei* (*čanga* ~ *höndij* in Cyrillic Mongolian) are used by e.g. Tömörčérén (1967b; 1969c), who gives the Russian equivalents as *sil'nyj* 'strong' ~ *slabyj* 'weak'; Bayancogtu (1982b); Qaserdeni et al. (1996: 104 ff.); Jin (1987). Hattori (1975; 1978; 1980) uses the terms open ~ closed. Tömörčérén (1969c), Jôo (1976b), and Norjin (1992b) use the terms vertical harmony (*uužimših zohicol*), diagonal harmony, and wide–narrow harmony (*aguu uyitan-u jokical*), respectively.

The assumption that Mongolian vowel harmony is based on tongue root retraction was first formulated by Cenggeltei (1963). In Cenggeltei (1959) and Cenggeltei and Sinedke (1959), the traditional terms *er-e* 'male' and *em-e* 'female' are used. Cenggeltei and Sinedke (1959) interpret their X-ray pictures of vowel articulation as showing that the main difference between [ʊ, ɔ, ɪ] and [u, o, i] is that the whole tongue body is more retracted in the first set of vowels. In Cenggeltei (1963), the traditional terms *cingg-a* 'tense, strong' ~ *kön-dei* 'hollow' are used with the interpretation (p. 11) that tense vowels are pronounced with tensing of the upper pharynx cavity and with the tongue root pulled backwards. Cenggeltei (1982) says that tense vowels are produced with tensed pharynx muscles and a retracted tongue root. In the 1983 Chinese version of Cenggeltei (1982), the terms 緊 *jǐn* 'tense' ~ 松 *sōng* 'lax' are used, and these are subsequently used by other scholars from China, e.g. Dobo (1984); Sun (1996b: 73). Analyses similar to Cenggeltei's have been proposed by Gregerson (1976: 361ff.) (tongue root fronted ~ backed) and Svantesson (1985) (pharyngeal ~ non-pharyngeal). Rialland and Djamouri (1984) use the feature [arrière] ('back') which is realized phonetically as [-ATR].

Jôo (1991–2; 1992; 1997) found that for each vowel harmony pair [u ~ ʊ, o ~ ɔ, ɤ ~ ə], the second member has higher oral airflow than the first one. Bao Huaiqiao and Lü (1992) measured the intensity level of the two first formants, and found that the 'tense' (pharyngeal) vowels have a relatively higher F2 level than the 'lax' vowels. (See also the literature cited in 5.2.)

## Appendix C – Chapter 2

**2.1 Stops and affricates.** Vitale and Sercey (1897) say that Halh *d* (our [tl]) is similar to *t*. Vladimircov (1929: 60ff., 384, 402), Poppe (1931; 1936: 11; 1951a; 1955:

103), and Sanžeev (1953: 87) repeat Ramstedt's description of strong and weak stops (using the terms *sil'nyj ~ slabij* when writing in Russian). Rudnev (1905: 7) and Todaeva (1951) characterize the two series as voiceless ~ voiced (*gluhoj ~ zvonkij*), as does Hattori (1943) (無声 *musei* ~ 有声 *yúsei*). Mongolists from China, including Qaserdeni (1958), Cenggeltei (1959; 1963; 1979a: 55ff.), Cenggeltei and Coyijongjab (1959), Qaserdeni et al. (1996: 101), and Sun (1996b), usually label the two series of stops and affricates as aspirated (Ch 送气 *sòng qì*, Mo (*kei-yin*) *türilte-tei*) vs. unaspirated (Ch 不送气 *bú sòng qì*, Mo (*kei-yin*) *türilte ügei*).

Most Mongolian researchers use the Mongolian terms *čanga ~ sul* 'strong/tense ~ weak/lax' or Russian *sil'nyj ~ slabij* 'strong ~ weak'. Luvsanvandan (1966c: 27) and Coloo (1976) interpret these terms as being more or less equivalent to voiceless ~ voiced (*duugüi ~ duutai*). Möömöö (1976; 1977; 1979) says that the strong ~ weak opposition involves the degree of tenseness (*naprjažennost'*); strong stops are voiceless and may be aspirated, while weak stops sometimes are voiced. He does not regard voicing as phonologically relevant, however. Sanžaa (1987a) says that strong stops are aspirated except when the next syllable has a strong stop and the intervening vowel is short (cf. 10.10). See also Luvsanvandan (1960).

2.1.1 *Stops in other Mongolian dialects.* Aberle and Austin (1951) say that the Chahar Mongolian stop series are voiceless fortis aspirated vs. voiceless lenis unaspirated. Austin, Hangin, and Onon (1956) say that Chahar stops are aspirated vs. unaspirated voiceless. Jôo (1973b) found that Chahar stops are aspirated vs. unaspirated voiceless, but that the Halh ones are unaspirated voiceless vs. voiced. VOT measurements for Chahar were published by Köke (1998a) and by Köke and Coyijongjab (1999: 121, 162).

2.1.2 *Buriad and Kalmuck stops.* Podgorbunskij (1910: 16) says that Halh *t* and *d* (our [*t<sup>h</sup>*, *t*]) are very similar to each other, and that the corresponding consonants in Buriad (i.e. our [*t<sup>h</sup>*, *d*]) are less similar. According to Ramstedt (1957: 42), the weak consonants in Western Halh, Kalmuck, and Buriad are often voiced, but in Southern and Eastern Halh, the strong consonants are more heavily aspirated, and the voicing of the weak consonants depends on sandhi rules (cf. deaspiration, 10.10). Poppe (1930b: 12) says that all Buriad dialects as well as Oirad have a voiced rather than voiceless *d*, and a *t* that is not very aspirated; he says that, in contrast, Mongolian *d* (our [*t*]) is voiceless. Poppe (1938: 39) says that the Buriad weak stops may be voiced depending on the dialect. According to Sanžeev (1941), the Buriad stop series are voiceless ~ voiced (*gluhoj ~ zvonkij*) or strong ~ weak. Buraev (1959: 41) analyses the two series in Buriad as strong vs. weak, the weak consonants often being voiced in syllable-initial position or before voiced sounds. Buraev (1987a: 42) says that the strong stops often, but not always, are aspirated, and that *b* often is voiceless initially. Bitkeev (1965; 1983) describes the two series of consonants in Kalmuck as strong ~ weak (*sil'nyj ~ slabij*), and says that the weak consonants may be voiced, but that this is not their distinctive property. Iliškin (1973) and Pavlov (1983) use the terms voiceless ~ voiced (*gluhoj ~ zvonkij*).

## Appendix D – Chapter 3

3.2.1 *Palatalized consonants.* Scholars who recognize the existence of palatalized consonant phonemes in Mongolian or Buriad are: Castrén (1857: 1); Rudnev (1913–14); Ramstedt (1932); Poppe (1938: 39); Nadeljaev (1957); Buraev (1959: 49); Sanžeev (1959: 23); Bitkeev (1975b); Coloo (1976; 1987: 28); Rassadin (1976); Möömöö (1977); I. D. Buhaeva (1980); Saitô (1986); Sanžaa (1987a); Zolhoev (1989; 1991). Todaeva (1951) says that there are palatalized consonants in Mongolian (p. 41), but does not include them in the table of ‘all consonants’ (p. 33). Similarly, Sanžeev (1941: 20) says that palatalized consonants are phonemes in Buriad, but does not include them in the consonant table (p. 21). Sanžeev (1982) says that Mongolian and Buriad palatalized consonants have not been completely phonemized, but does not explain what that means. Scholars who do not recognize the existence of palatalized consonant phonemes include Ramstedt (1902), Poppe (1951a; 1970), Street (1963), Luvsanvandan (1964b; 1967; 1982b; 1985), and Tömörčérèn (1969b).

3.2.2 *Velar and uvular consonants.* Vladimircov (1929: 123ff.); Damdinsürèn (1958: 25); Tömörčérèn (1966b); Luvsanvandan (1978; 1980a); Saitô (1985); Shimizu (1992). Badmaev (1980b) and Soktoeva (1980a) give X-ray pictures which show clearly the velar ~ uvular alternation in Tsongool Mongolian and Buriad, respectively.

## Appendix E – Chapter 5

5.2 *Vowel harmony.* Literature on the phonetic basis of vowel harmony is cited in Appendix B, 1.1.1, p. 219. Mongolian vowel harmony, especially the transparent vowel *i* and the blocking of rounding harmony by the rounded non-open vowels *u* and *ü*, has been debated quite extensively in the theoretical linguistic literature: Bin-nick (1969; 1980); Tretiakoff (1975); Odden (1977; 1980); Chinchor (1979); Jensen and Stong-Jensen (1979); Steriade (1979; 1987: 355ff.; 1995: 148); S. Anderson (1980); Hamp (1980); Cohen (1981); Halle and Vergnaud (1981: 12f.); Leben (1982: 178f.); Yamada (1983: 47ff.); Goldsmith (1985); van der Hulst and Smith (1986); Schein and Steriade (1986: 716); J. Anderson and Ewen (1987: 276ff.); Lieber (1987: 134ff.); Demirdache (1988: 74); Walker (1993). All these assume palatal harmony and are therefore of limited value as analyses of Hallh Mongolian. Analyses which assume vowel harmony of the pharyngeal ([–ATR] or [RTR]) type are Cenggeltei (1963; 1982); Rialland and Djamouri (1984); Svantesson (1985); van der Hulst and Smith (1987; 1988); Kim Chu-wǒn (1988a, b; 1992; 1999a); Archangeli and Pulleyblank (1994: 266ff.); Ch'o Mi-hŭi (1994: 191ff.); Hong Söng-hun (1994a: 170–231; 1994b; 1996); Denwood (1995; 1996; 1997a, b); Kaun (1995: 39–65); Xiao (1995); Li Bing (1996; 1999); Esenova (1998); see also Kurabayashi (1981c) and Sun (1981).

## Appendix F – Chapter 6

6.2 *Syllabification of morphologically simple words.* Mongolian syllabification has not been treated extensively in the literature. Cenggeltei (1979a: 148) gives a

right-to-left syllabification rule, expressed in the form of a rule for converting the Classical Mongolian script into the modern pronunciation. Rialland and Djamouri (1984: 337ff.) also give a right-to-left syllabification rule for Mongolian; see also Kuribayashi (1988) and Harada (1999).

6.4 *Cyclic syllabification.* Various restrictions on resyllabification after morphological operations have been proposed in the literature. Booij (1992) proposes that resyllabification can only change the final coda of the input form. This is too strict for Mongolian, where the entire final syllable can be changed. On the other hand, resyllabification restrictions are crucial in Mongolian, since they explain why words with different morphology are syllabified (and given epenthetic vowels) in different ways.

## Appendix G – Chapter 7

7. *Prosody.* Esenova (1985; 1986b; 1987c; 1992b, c); Pjurbeevo (2000). *Mongolian intonation:* Möömöö (1985); Esenova (1992a); Ichinose (1992a); Bao Huaiqiao and Köke (2000); Karlsson (2001; 2003b); Köke (2003a, b). *Buriad intonation:* Zolhoev (1973c); Bjuraeva (1976a, b, c; 1977; 1978; 1983; 1986a, b, c; 1987; 1988; 1989; 1990; 1991; 1996; 1998; 1999); B. Budaev (1983; 1987b); Mohosoeva (1986a, b; 1988; 1989); Balagunova (1987b); Pavlova (1987a, b; 1988; 1989; 1991); Bjuraeva and Pavlova (1989); Žargalov (1989); Buraev (1991); Esenova (1992d); Dambueva (1998). *Kalmuck intonation:* Esenova (1979; 1980; 1984; 1986a; 1987a, b; 1989a, b); Pavlov and Esenova (1984); Mušaev (1987); Barangova and Esenova (1990).

7.5 *Word stress.* Shimizu (1979; 1985; 1991–2; 1996); Batujirgal (1981); Jôo and Mikami (1981); Kakudô (1982a; 1992); Bayancogtu (1987); Buraev (1987c); B. Budaev (1991); Coyijongjab (1993a); Bayarmendü (1997b); Erdenicugla (1998); Köke (1998c); Tugtambayar (2002). Kakudô (1982a) says that the first mora of a word is low, then there is a rise, and finally a fall before the last or next to last mora. *Buriad:* Poppe (1930b: 67ff.); Bajčura (1961: 232; 1971; 1978); B. Budaev (1979; 1981; 1984; 1986a, b; 1987a, b; 1989; 1991). Bajčura says that there is tonic stress (i.e. higher pitch) on the last syllable.

## Appendix H – Chapter 8

8.2 *Sino-Mongolian.* The Mongolian name of the *Secret history of the Mongols* is *Monggol-un niguca tobciyan*. The Modern Standard Chinese pronunciation of the Chinese name form is *Menggu mishi*, but the obsolescent pronunciation *Menggu bishi* (Wade-Giles transcription: *Mēng-ku pi-shih*) is often used in the Mongolist literature. The book is also known as the *Secret history of the Yuan dynasty* (*Yuan chao mishi* in Chinese). Hung (1951) and de Rachewiltz (1965) deal with the history of the text. *Additional literature on Sino-Mongolian phonology:* Kobayashi (1954); Street (1957a; 1986); Manlažav (1973a, b); Saitô (1993b); Kökebars (1994); Žam"jan (1995).

8.3 *Arabic Mongolian.* In his publication of the Mongolian material of the Leiden manuscript, Poppe (1927–8) dates it to 1245 (following M. T. Houtsma),

but in the introduction to a reprint of this article (Poppe 1972b), he says that the correct date is 1343. See Saitô (2003) for several aspects on Arabic Mongolian.

8.5 *Old Mongolian vowels*. A few authors, including Kögjiltü (1982), Cenggeltei (1985b: 24), Kuldinow (1985), and Möngkebuyan (1998), reconstruct Old Mongolian with only five vowels \*i, \*e, \*a, \*u, \*o. These authors do not make it clear, however, how the development to the Modern Mongolian seven-vowel system took place. Li Bing (1996; 1999) assumes that Old Mongolian had a vowel system similar to the one found in Modern Mongolian proper, and Kögjiltü (1986b; 1989a; 1991; 1993) makes a similar assumption for the Middle Mongolian vowels. Irincin (1976–8) and Nangrub (1981) assume that Old Mongolian \*e was pronounced [y] (as in most Mongolian dialects of South Mongolia), but Kögjiltü (1986b) reconstructs its sound value as [e]. *Additional literature*: Poppe (1933c); Rincindorji (1960); Nomura (1965–73; 1971; 1976; 1979); Luvsanvandan (1966e; 1977); Manlažav (1969); Tömörčerēn (1976); Yu Shichang (1985); Jalsan (1989); Kürelbagatur (1989); Bayanbagatur (1994); Qaserdeni (1994); Tulgaguri (1994); Kökebars (1998); Bayar (2000); Dašcēdēn (2000).

8.5.1 *Primary long vowels*. Nomura (1953) and Poppe (1955: 74ff.) observed that Monguor has long vowels corresponding to Mongolian short vowels in some words, but did not derive them from Proto-Mongolic. The existence of long vowels in Proto-Mongolic, based on Monguor, Dagur, and Moghol data, and also on comparisons with some Turkic (Turkmen, Yakut) and Tungusic (Evenki) languages was proposed by Hattori (1959); Nomura (1959a, b; 1972; 1979); Poppe (1959; 1960a: 92, 96ff.; 1961; 1962; 1965: 179; 1967); Ligeti (1964); Pritsak (1964: 162); Kim Pang-han (1971); Kuz'menkov (1989); Kürelbagatur (1991a). Vladimircov (1929: 305) and Ramstedt (1957: 165) do not reconstruct long vowels, and Doerfer (1964c; 1970; 1974) finds that the theory of long vowels in Proto-Mongolic is far from being proved. See also Murayama (1970), Bulucilagu (1986), and Möngkebuyan (2000a).

8.6 *Vowels in non-initial syllables and vowel harmony*. Almost everyone who wrote about vowel harmony in Proto-Mongolic or Classical Mongolian assumed palatal harmony: Poppe (1951b; 1954a; 1955: 84ff.; 1960a: 147ff.; 1965: 184); Ramstedt (1957: 150ff.); Hamp (1958); Sanžeev (1964b); Lightner (1965); Zimmer (1967); Kiparsky (1968: 19, 33); Ultan (1973: 42ff.); Kim Sök-tük (1976; 1982); Lieber (1987: 56ff.); Darbeeva (1996: 111ff.); Guw-a (1996). Li Bing (1996) assumes, however, that Proto-Mongolic had RTR harmony (pharyngeal harmony), like Modern Mongolian proper. *Additional literature*: Thomsen (1959); Poppe (1960a: 117ff.; 1966; 1968; 1969b; 1975b); Tömörtogoo (1969; 1971); Bayancogtu (1981a, c); Kuz'menkov (1986); Qasbagan-a (1988).

8.6.4 *Proto-Mongolic \*u?* The vowel \*u is reconstructed in back-vocalic words by Vladimircov (1929: 118ff., 170ff.); Sanžeev (1953: 118; 1964b: 31ff.); Poppe (1955: 33, 42; 1960a: 92, 112ff.); Tömörtogoo (1992: 54ff.). Ramstedt (1957: 137) says that Proto-Altaic might have had this vowel, but that it merged with \*i in Mongolic. See also Yu Shichang (1983: 12ff.); Darbeeva (1996: 31); Sinedke (1998).

8.7.1 *Stops and affricates*. According to Vladimircov (1929: 384), the two

series are voiceless ~ voiced (*gluhie* ~ *zvonkie*) in ‘Written Mongolian’. Poppe (1955; 1960a: 9; 1976) uses the terms strong ~ weak (*stark* ~ *schwach* or *fortis* ~ *lenis*) and says that aspiration was important. Furthermore, Poppe (1955) says that the two series were voiceless ~ voiced in Common Mongolian (pp. 95–6), but also that ‘Common Mongolian \**t* [our \**t<sup>h</sup>*] was probably a strongly aspirated dental consonant’ (p. 102) and ‘Common Mongolian \**d* [our \**t*] was a voiceless weak consonant (*media lenis*)’ (p. 105). Ramstedt (1957: 37) says that the two series (in Proto-Altaic) were perhaps voiceless ~ voiced (*tenuis* ~ *media*), but more probably *fortis* ~ *lenis*, and that aspiration was an important feature of the *fortis* series. Doerfer (1964b: 54) uses the terms voiceless ~ voiced (*stimmlos* ~ *stimmhaft*). Hattori (1972: 63; 1973: 36) says that Proto-Mongolic had voiceless aspirated *fortes* vs. (half-)voiced unaspirated *lenes*. Tömörtoogoo (1992: 118) uses the terms voiceless ~ voiced (*duugüi* ~ *duutaj*). Darbeeva (1996) uses the symbols for voiceless and voiced consonants, but does not describe the two series, except that \**t* (our \**t<sup>h</sup>*) is characterized as voiceless (*gluhoj*) and \**d* (our \**t*) as weak (*slabyj*) (pp. 74–5). Möngkebuyan (2002) reconstructs aspirated and unaspirated series. See also Šongqor (1987). *Velars and uvulars*: Poppe (1955: 129ff.); Odden (1980); Finch (1989–91); Möngkebuyan (2002). Poppe (1960a: 10) says that uvulars and velars were allophones in Proto-Mongolic (*Urmongolisch*), but on p. 16 he says that they had developed to two different phonemes already in Pre-Mongolic (*Vormongolisch*). *Absence of \*t and \*t<sup>h</sup> before \*i*: Ramstedt (1902: 11; 1914; 1932; 1957: 42, 81); Vladimircov (1929: 395, 405); Sanžeev (1953: 93); Poppe (1955: 103; 1956b; 1960a: 14, 22, 26; 1966); Clauson (1962: 206); Doerfer (1985b: 176); Badgaev (1989c); Tömörtoogoo (1992: 123ff.); Kuz'menkov (1993b).

8.7.2 *The fricative \*h*: Poppe (1955: 96; 1958; 1960a: 10; 1969a; 1976), Luvsanvandan (1975a), Krippes (1992), and Möngkebuyan (2002) reconstruct Proto-Mongolic \**p*. Tömörtoogoo (1992: 121) reconstructs Proto-Mongolic \**f* (from Proto-Altaic \**p*), and says that it developed to *x* in Old Mongolian and *h* in Middle Mongolian. See also Širokogorov (1931: 113ff.); Kobayashi (1954); Aalto (1955); Clauson (1962); Luvsanbaldan (1962); Doerfer (1968; 1985b: 148ff.; 1996); Poppe (1969c); Vanduj (1978); Yu Shichang (1983: 17ff.); Bayanbagatur (1987); Kuz'menkov (1988b); Bulag (1990; 1993b); Wang (1992a, b); Huang (1993; 1997); Ardjab (1994); Rozicki (1994); Darbeeva (1996: 69ff.); Janhunen (1999).

## Appendix I – Chapter 9

9. *The Mongolic languages*. Vladimircov (1929); Sanžeev (1952; 1953); Benzing (1953); Ramstedt (1957: 25ff.); Cenggeltei (1957–8; 1985b); Poppe (1965); Ber-tagaev (1968b); Comrie (1981); Möömöö and Mönh-Amgalan (1984); Schwarz (1984); Sun (1985); Ramsey (1987); Sun et al. (1990); Pjurbee (2001b).

9.1 *Mongolian. Dialects of Mongolia*: Luvsanvandan (1959; 1961b); Nagy (1960); Coloo (1967c; 1985; 1987); Vanduj (1973); Rinčen (1979); Janhunen (2003d). *Dialects and standard language of South Mongolia*: Hattori (1937b); Nomura (1941b); Sturt (1941); Todaeva (1956; 1957; 1960a, b; 1985; 1997d); Coyijongjab (1957; 1978; 1993b); Cenggeltei (1957–8; 1978; 1979b); Qaserdeni

and Naranbatu (1978); Türgen (1978); Chen (1993; 1995b; 1999); Sun (1996b); Qaserdeni (2000); Péljei (2001); Janhunen (2003d).

*Northern Halkh.* *Bayad:* Öljetibürin (1992). *Darhad:* Sanžeev (1931); Tömörto-goo (1967); Šarhüü (1979–80; 1984). *Mongolian of Tuva:* Bitkeev (1973; 1980); Ulanova (1987; 1988). *South Selenge ‘Burriad’:* Poppe (1934a; 1971); Čagdurov (1951); Radnaev (1960); C. Budaev (1962; 1965; 1977b; 1980); Buraev (1965); Badmaev (1980a, b); Sanžina (1989).

*Southern Halkh.* *Abaga:* San (2002). *Arhangai:* Coloo (1962; 1969). *Darigan-ga:* Róna-Tas (1960a). *Eastern Halkh:* Vanduj (1967). *Gobi Halkh:* Coloo (1967a). *Övörhangai:* Tömörčérén (1967a). *Sönid:* Qadacilagu (1984); Cogbayar (1989); Öljetibürin (2000; 2001). *Western Halkh:* Bese (1961). *Zavhan Sartuul:* Vanduj (1964); Baatar (1987).

*Southern Mongolian.* *Chahar:* Aberle and Austin (1951); Hattori (1951); Bayancogtu (1962); Hangin and Street (1962); Tömörčérén (1966a); Jőo (1973b; 1975); Danzan (1978); Nadamid (1978; 1986; 1993; 1998); Qaserdeni (1980b); Secenbagatur (1982); Temür (1982); Uuda (1982); Sun (1983); Todaeva (1985); Türgen (1985, 1988); Coyijongjab (1989a, b); Qasbagan-a (1990); Ichinose (1992b); Coyijongjab and Jőo (1993); Kürelbagatur (1993); Idam (1994); Köke and Coyijongjab (1996); Köke and Sodobagatur (1996); Bayarmendü (1997c; 1998a); Naranbatu (1999). *Ordos:* Soulié (1903); Rudnev (1911); Whymant (1926); Mostaert (1926–7); Qaserdeni (1959; 1981a; 1985); Poppe (1964c); Street (1966); Batujirgal (1981); Kurabayashi (1982a); Todaeva (1985); Serengnorbu (1986; 1996); Erdenimönge (1987); Möngkebuyan (1990); Banzargarudi (1998); Erdenibagatur (1998); Naranbatu (1999); Georg (2003a). *Üjemchin:* Kara (1962; 1963); Tömörčérén (1964; 1969a); Kökebars (1991); Nomintuyag-a (1992); Kökebars and Cimeg (1997).

*Naiman.* Bulu (1984); Sangdögüreng and Cegen (1989); Öljetitogtaqu (1991); Secen (1994; 2000); Xi Caiyun (1995); Mönggügerel (1998).

*Eastern Mongolian.* *Arhorchin:* Rudnev (1911); Secen (1988, 2000). *Baarin:* Cenggeltei (1959; 1961); Secenbagatur (1959; 1982); Bayancogtu (1962); Jalcib (1962); Dobo (1964; 1982); Todaeva (1985); Bayarmendü (1997a, b, c; 1998a); Secen (2000). *Gorlos:* Rudnev (1911). *Harchin:* Nomura (1940–1; 1941a; 1950; 1951; 1957; 1960); Todaeva (1985); Nolmajab (1986; 1991); Kögjiltü (1987b; 1990); Sodobagatur (1999; 2000; 2001); Qasbagatur (2002). *Horchin:* Bosson and Unensečen (1962); Caganqada (1979; 1981; 1985b; 1996); Coyijongjab (1982a); Togog-a (1983a, b); Öljei (1984); Todaeva (1985); Qayirqan (1990); Tulguri (1996; 1997); Bayarmendü (1997b, c; 1998a); Möngkebuyan (1997); Tong (1998); Cenggeltü (1999); Bayancogtu (2001); Soyol (2002). *Hüree:* Togog-a (1991b); Guw-a (1993); Sinquwa (1994); Xiuhua (2002). *Ih Minggan:* Todaeva (1985; 1988). *Jalaid:* Nasunbayar (1987c); Böke (1994); Öljetibürin (1994). *Jaruud:* Togog-a (1991a); Xiao (1995). *Jirim:* Ilan and Saran (1998). *Mongoljin:* Qai (1987); Edquriyagci and Uran-a (1991); Edquriyagci (1996); Mansang (1998). *Tariach:* Boo (1997).

*Urad.* Bulu (1980); Batusayiqan (1985); Möngkebuyan (1992a; 1997); Naranbatu (1994; 1999); Ulagantuyag-a (1997).

9.2 *Buriad*. The number of Buriad speakers in Russia was calculated from data given by D. D. Damdinova ([www.belti.msk.ru/unesco/d10e.htm](http://www.belti.msk.ru/unesco/d10e.htm), accessed December 2001) (see also Dyrheeva, Budaev, and Bažeeva 1999).

*Older sources.* During the eighteenth century, Buriad word lists were recorded by Daniel Gottlieb Messerschmidt, Gerhard Friedrich Miller, Mihail Tatarinov, Peter Simon Pallas, Ivan Čemesov, and others. See C. Budaev (1992: 6ff.), who also uses these collections for tracing the development of Buriad dialects through time.

*Phonology.* Castrén (1857); Podgorbunskij (1910); Poppe (1933a; 1938; 1960b; 1964b); Sanžeev (1941; 1951); Bertagaev (1947; 1968a); Buraev (1962; 1983; 1987a, b; 1988a, b; 1989; 1993; 1995); Zolhoev (1963a, b; 1977; 1980); Buraev, Bažeeva, and Pavlova (1975); Rassadin (1976; 1982); Darbeeva (1978; 1988; 1992; 1997); Clark (1979); Soktoeva (1980b; 1986a, b); Matheev (1984); C. Budaev (1986; 1987); Damdinov (1986); Gantogtoh (1990); Walker (1994); Skribnik (2003). See Chapter 7 for literature on Buriad stress and intonation, and Chapter 2 for Buriad stops.

*Dialects.* Bálint (1877); Poppe (1933b; 1941a); Hattori (1940); Sanžeev (1953: 46ff.); Alekseev (1949; 1955); Rygdylon (1957); Cydendambaev (1960; 1968); Šagdarov and Rassadin (1968); C. Budaev (1978; 1986; 1992; 1993); Balagunova (1986; 1989); Cyrenov (1998).

*Eastern Buriad.* Aga: Poppe (1932c); Šagdarov (1968). *Buriad of Mongolia:* Gantogtoh (1990; 1993). Hori: Rudnev (1913–14); Bertagaev (1936); Sanžeev (1939); Bese (1964). *Ulan-Ude:* Cyrendoržieva (1977).

*Northwestern Buriad.* *Baigal-Hudari:* Abašeev (1951; 1956); Cydendambaev (1964); Matheev (1972b); Buraev (1976). *Bargazhan:* Radnaev (1958; 1965). *Boohon:* Homonov (1958; 1965); Bjuraeva (1996). *Ehired-Bulagad:* Matheev (1956; 1957; 1968). *Ivalga:* Abašeev (1951); Bese (1962); Cyrenov (1996). *Kabansk:* Čeremisov (1947). *Kachug:* Mitroškina (1968). *North Selenge:* C. Budaev (1977a). *Oł'hoon:* Babuev (1991). *Osa:* Balagunova (1987a).

*Southwestern Buriad.* Rassadin (1991; 1996a). *Aha:* Rassadin (1989a). *Alair:* Poppe (1930b); Buraev (1968). *Tünhen:* Čeremisov (1941); Abašeev (1958; 1965); Matheev (1972a).

*Nizhneudinsk.* Sanžeev (1930); Darbeeva (1960); Rassadin (1988; 1999).

*Bargu.* Poppe (1932a); Tömörčérèn (1971); Boosiyang (1981); Pürbü (1987); Janhunen (1988); Rassadin (1989b); Boosiyang and Jirannige (1996).

9.4 *Oirad*. During the eighteenth century, Kalmuck vocabularies were collected by several persons including Nicolaas Witsen from Amsterdam, and the Swedes Filip Johan Stralenberg and Johan Christian Schnitscher (see Doerfer 1965 and Krueger 1975). The Swedish missionary Cornelius Rahmn, who was among the Kalmucks from 1819 to 1823, wrote unpublished Kalmuck–Swedish and Swedish–Kalmuck dictionaries, whose manuscripts are kept in Uppsala University Library. A Kalmuck–German dictionary was published in 1854 by the Herrnhutian missionary Heinrich August Zwick.

*Phonology.* Navrockij (1840); Popov (1847); A. A. Bobrovnikov (1849); Kotwicz (1929); Sanžeev (1940); Posch (1957–8; 1964b); Coyijongjab (1959); Bormanshi-

nov (1961); Pavlov (1963a); Bitkeev (1965; 1978; 1981; 1982; 1983; 1985a, b; 1988); Todaeva (1968); Benzing (1985); Secen (1989); Sambuudorž (1996; 2002); Süriüng (1997); Birtalan (2003); Bläsing (2003).

*Dialects.* Kara (1958); Kičikov (1967a); Ulanova (1992). *Alshaa:* Secenbilig (1982); Cogtu (1985); Gereltü (1986; 1991; 1992); Batugerel (1989). *Bayad:* Baldan and Coloo (1974). *Buzaawa:* Kičikov (1967b). *Dörbed:* Vanduj (1962; 1965); Kičikov (1963; 1967a). *Hoshuud:* Todaeva (1970); Jia (1982; 1986a, b); Caganqada (1985a); Sonam (1985); Oyunceceg (1986; 1987); Bayasqal (1987); Cüngkerja (1987); Dobo and Caganqada (1987); Dorjicang (1987); Dobo (1997). *Karakol Kalmuck:* Dondukov (1973; 1975); Tenišev (1976; 1997); Pavlov (1990); Esenova (2001). *Ööld:* Badmadorž (1984; 1987a, b). *Subei:* Qaserdeni (1990). *Torguud:* Coloo (1964); Ubušaev (1969a, b, c; 1979); Luvsanbaldan (1975); Bimba (1981); Taya (1992). *Tsaatan:* Ubušaev (1970); Badgaev (1989b). *Ural:* Pavlov (1964). *Urianhai:* Coloo (1973a). *Zahchin:* Coloo (1964; 1965).

9.5 *Dagur:* Aberle and Austin (1951); Austin (1952); Nomura (1960); Martin (1961); Poppe (1964d); Zhong (1965; 1980; 1982); Weiers (1978); Qagancilagu and Kögjimtei (1979); Engkebatu (1982); Namtsarai and Qaserdeni (1983); Söng Paeg-in (1983); Satô (1985); Sun (1985; 1996a); Todaeva (1986; 1997b); Kakudô (1987a); Üjügür (1987); Badarangg-a (1988); Kurabayashi (1993); Ardjab (1994); Chuluu (1994c; 1996); Tsumagari (2003). *Hailar dialect:* Poppe (1930a; 1934b); Tsumagari (1985). *Qiqihar dialect:* Wang (1989). *Xinjiang dialect:* Ding (1992; 1995).

## Appendix J – Chapter 10

10. *Development of the modern Mongolic languages.* In addition to the standard works mentioned, other general works on the historical phonology include Šmits (1898); Osada (1952); Murayama (1960); Poppe (1964a; 1975a); Luvsanvandan (1966a); Weiers (1969); Nangrub (1981); Pürbü (1981); Liu (1984); Luvsanvandan and Bold (1985); Kuz'menkov (1988a); Sanžaa (1993; 1998); Ang (1994); Qasbagan-a (1996); Šongqor (1996); Janhunen (2003a, b); Rybatzki (2003a); Saitô (2003). Rassadin (1982) and Buraev (1987a) discuss the historical phonology of Buriad from a general Mongolic point of view.

10.1 *The Mongolic vowel shifts.* Mongolists have often ignored the vowel shifts in Mongolian proper and Buriad, implicitly regarding them as surface phenomena which only affect the pronunciation of the vowels, not the vowel system as such. An exception is Bosson and Unensečen (1962), who describe the vowel shift for Horchin (Eastern Mongolian) in terms of centralization and a shift backwards (corresponding to our velarization) and a shift downwards (pharyngealization). See also Hattori (1978; 1980); Janhunen (1981); Qaserdeni (1981b); Darbeeva (1996: 18ff.). Kögjiltü (1982; 1985; 1986c; 1989a, b; 1991) and Cenggeltei (1985b: 24), who refers to a ‘young researcher’, presumably Kögjiltü, give vowel correspondences corresponding to the Dagur and Monguor vowel shifts, but assume that the Old Mongolian vowel system was a five-vowel system similar to that in Monguor, and that Middle Mongolian had more or less the same vowel qualities as modern

Halh. Kögjiltü regards the front rounded vowels *y*, *ø* in Oirad as secondary, having developed due to Turkic influence.

10.2 *Vowel splits and mergers. Split of \*i in Mongolian dialects:* Bayancogtu (1981b); Dobo (1983a); Batusayiqan (1985); Ünenci (1987); Ichinose (1992b); Möngkebuyan (1992b; 1997); Kürelbagatur (1993); Nadamid (1998); Qasbagan-a (2002). Bitkeev (1973) provides X-ray pictures which show that [u] is the reflex of \*i in back-vocalic words in the Mongolian dialect spoken in Tuva. *Opening of \*u:* Kičikov (1967a); Bitkeev (1976); Sinquwa (1994); Böke (1999).

10.3 *Long vowels.* Ramstedt (1912); Kobayashi (1954); Posch (1957–8); Luvsanvandan (1966d); Tömörtoogoo (1967; 1980; 1990; 1995); Bertagaev (1971); Ubušaev (1973); Bulag (1982; 1983–4); Rassadin (1982: 38ff.); Tian (1983); Kürelbagatur (1991; 2001); Nasunöljei and Nabčingerel (1997); Kökebars (1998); Jirannige (1999); Möngkebuyan (2000b); Li Meiling (2001).

10.7.3 *Regressive \*i-assimilation.* A. A. Bobrovnikov (1849: 22ff.); Grunzel (1895: 22ff., 27); Poppe (1930b: 48ff.; 1956a); Nomura (1953); Kobayashi (1954); Sanžeev (1957; 1964a; 1970); Kałużyński (1965); Pavlov (1969); Tömörtoogoo (1971; 1987a); Rassadin (1976; 1982: 23ff., 119ff.); Thomsen (1976; 1987); Kuribayashi (1981a, b; 1982a, b; 1985b); Hattori (1983a, b); Kögjiltü (1984); Bulucilagu (1985b); Erdenimönge (1987); Janhunen (1990b); Qayirqan (1990); Kürelbagatur (1993); Garudi (1996); Kim Chu-wön (1999b); Möngkebuyan (2001); Qasbagan-a (2002).

10.10 *Deaspiration and related processes. Regressive deaspiration:* Luvsanvandan (1960; 1975c); Kara (1962; 1963); Coloo (1967a; 1969); Vanduj (1967); Tömörcérén (1969a); Gantogtoh (1978); Dobo (1981); Temür (1982); Cenggeltei (1985a; 1989b); Serengnorbu (1986); Sanžaa (1987b; 1988); Öljevitogtaqu (1991); Kökebagatur (1992); Nadamid (1993); Idam (1994); Kökebars and Cimeg (1997). *Progressive deaspiration:* Poppe (1955: 98); Hattori (1972: 65ff.); Cenggeltei (1985a; 1989b); Satô (1991–2). *Creation of p<sup>h</sup>:* Buraev (1987a: 41); Cenggeltei (1988); Darbeeva (1996: 142ff.).

## REFERENCE

All references to the same author are collected under one name form; for ethnic Mongolian authors, the Mongolian name has been preferred. Cross-references are given in the Index.

For some periodicals, for example *Studia Mongolica*, the volumes are divided into fascicles. In some cases, a number of fascicles which are only part of a volume of the series are bound as a separate physical volume. This is indicated in the following way in the bibliography: *StMo* 3/6–11: fasc. 8 (pp. 14–35), that is, fascicle 8 of volume 3 of *Studia Mongolica*, a fascicle that consists of pages 14 to 35 in the physical volume consisting of fascicles 6 to 11 of volume 3 of the series. If the physical volume coincides with the series volume, the number of fascicles of the physical volume is not shown, for example, *StMo* 8: fasc. 14 (pp. 183–90).

### Abbreviations

In general, we follow the abbreviations used in the *Linguistic bibliography*.

AH	<i>Alt'ai hakpo</i> ( <i>Journal of the Altaic society of Korea</i> ) (Söul).
AN	Akademija nauk [Academy of sciences].
AOH	<i>Acta orientalia Academiae scientiarum Hungaricae</i> (Budapest).
BF	Burjatskij filial Sibirskogo otdelenija Akademii nauk SSSR [Buriad branch of the Siberian division of the USSR Academy of sciences].
BIHP	<i>Zhōngyāng yánjiūyuàn lìshǐ yúyán yánjiūsuǒ jíkān</i> ( <i>Bulletin of the Institute of history and philology, Academia Sinica</i> ) (Táiběi).
BION	Burjatskij institut obšestvennyh nauk Sibirskogo otdelenija Akademii nauk SSSR [Buriad institute of social sciences at the Siberian division of the USSR Academy of sciences]; from 1992: . . . Rossijskoj akademii nauk [. . . of the Russian Academy of sciences] (Ulan-Udè).
BKI	Burjatskoe knižnoe izdatel'stvo.
BM	Burjat-Mongol'skij [Buriad Mongol].
BMNIIK	Burjat-Mongol'skij naučno-issledovatel'skij institut kul'tury [Buriad Mongol scientific research institute of culture] (Ulan-Udè).
BNC	Burjatskij naučnyj centr Sibirskogo otdelenija Akademii nauk SSSR [Buriad scientific centre at the Siberian division of the USSR Academy of sciences]; from 1992: . . . Rossijskoj akademii nauk [. . . of the Russian Academy of sciences] (Ulan-Udè).
CAJ	<i>Central Asiatic journal</i> (The Hague; Wiesbaden).
CLS n	<i>Papers from the nth regional meeting of the Chicago linguistic society</i> .
GIJaLI	Gosudarstvennyj institut jazyka, literatury i istorii [State institute of language, literature, and history] (Ulan-Udè).
GK	<i>Gengo kenkyû</i> ( <i>Journal of the Linguistic society of Japan</i> ) (Tôkyô).

- HBK* *Hoppô bunka kenkyû* (*Bulletin of the Institute for the study of North Eurasian cultures, Hokkaido University*) (Sapporo).
- HK* *Hitotsubashi kenkyû* (*Hitotsubashi journal of social sciences*).
- HOM* *Handbuch der Orientalistik I:V/2: Mongolistik* (Leiden: Brill). 1964.
- HZS* *Hèl zohiol(yn) (sudlal)*. Ulaanbaatar. (The name forms *Hèl zohiol*, *Hèl zohiol sudlal* and *Hèl zohiolyn sudlal* occur.)
- IAMS* International association for Mongol studies.
- IIFF* Institut istorii, filologii i filosofii Sibirskogo otdelenija Akademii nauk SSSR [Institute of history, philology, and philosophy at the Siberian division of the USSR Academy of sciences].
- IK* *Ibaraki Kirisutokyô daigaku kiyô* (*Academic journal of Ibaraki Christian college*).
- JSFOu* *Suomalais-ugrilaisen seuran aikakauskirja* (*Journal de la société finno-ougrienne*) (Helsinki).
- KKI* Kalmyckoe knižnoe izdatel'stvo.
- KNIIIFÈ* Kalmyckij naučno-issledovatel'skij institut istorii, filologii i èkonomiki [Kalmuck scientific research Institute of history, philology, and economics] (Èlista).
- KNIIJaLI* Kalmyckij naučno-issledovatel'skij institut jazyka, literatury i istorii [Kalmuck scientific research institute of language, literature, and history] (Èlista).
- KSBurNII* *Kratkie soobšenija Burjatskogo kompleksnogo naučno-issledovatel'skogo instituta* (Ulan-Udë: SO AN SSSR).
- KSINA* *Kratkie soobšenija Instituta narodov Azii* (Moskva).
- MK* *Mongoru kenkyû* (*Bulletin of the Japan association of Mongolian studies*). (Cf. *NMGK*.)
- MKB* *Monggol kele bicig* (*Mongolian language journal*). Kökeqota. (1954–7, continued as *Monggol teüke kele bicig* in 1958, and as *Monggol kele jokiyal teüke* in 1959–60; reestablished as *Monggol kele bicig* in 1979.)
- MKJT* *Monggol kele jokiyal teüke*. Kökeqota. (Cf. *MKB*.)
- MKSÖ* *Monggol kele sinjilegen-ü ögülel-üd* (Kökeqota: Öbör Monggol-un arad-un keblel-iin qoriy-a). 1987.
- MKUJ* *Monggol kele udq-a jokiyal* (*Mongolian language and literature*) (Kökeqota).
- MSYQ 2* *Öbör Monggol-un yeke surgaguli-yin qoyadugar udagan-u Monggol sudulul-un olan ulus-un erdem sinjilegen-ü yarilcaqu qural: kele bicig; Nèimènggû dàxué dì sān cì Mènggǔxué guójì xuéshù tǎolùnhui: yǔwén; The second international symposium on Mongolian studies under auspices of Inner Mongolia University: language* (Kökeqota). 1991.
- MSYQ 3* *Öbör Monggol-un yeke surgaguli-yin gurbadugar udagan-u Monggol sudulul-un olan ulus-un erdem sinjilegen-ü yarilcaqu qural: ögülel-ün tobci; The third international symposium on Mongolology sponsored by Inner Mongolia University: summaries of symposium papers* (Kökeqota). 1998.
- MTKASC* *Monggol töröl-ün kele ayalgun-u sudulul-un cuburil; Mènggǔ yǔzú yǐyán fāngyán yánjiū cóngshū* (Kökeqota: Öbör Monggol-un arad-un keblel-ün qoriy-a).
- MTKB* *Monggol teüke kele bicig* (Kökeqota). (Cf. *MKB*.)
- MUISÈ* *Mongol ulsyn ih surguul': èrdèm šinžilgèènij bičig* (Ulaanbaatar).
- MY* *Mínzú yǔwén* (*Minority languages of China*) (Běijīng).
- NagoKR* *Nagoya daigaku bungakubu kenkyû ronshû* (*The journal of the faculty of literature, Nagoya University*) (Nagoya).

- NDX* *Nèimēnggǔ dàxué xuébào: zhéxué shèhuì kēxué bǎn* (*Journal of Inner Mongolia University: philosophy and social sciences*). Subtitle changed in late 1990s to *Rénwén, shèhuì kēxué bǎn* (*Humanities and social sciences*) (Kökeqota). Chinese edition.
- NELS* *Proceedings of the North East linguistic society.*
- NLLT* *Natural language and linguistic theory* (Dordrecht).
- NMGK* *Nippon Mongoru gakkai kiyô* (*Bulletin of the Japan association for Mongol studies*) (Tôkyô). (This name is used from issue No 19; the journal started as *Nippon Mongoru gakkaihô* (No. 1), continued as *Nippon Mongoru gakkai kaihô* (No. 2–9, also abbreviated *NMGK*), and then as *Mongoru kenkyû* (No. 10–18)).
- NOS* *Nihon onkyô gakkai shûki kenkyû happyôkai kôen ronbunji* (*Proceedings of the autumn meeting of the Acoustical society of Japan*).
- ÔGDG* *Ôsaka gaikokugo daigaku gakuhô* (*Journal of Osaka University of foreign studies*).
- ÔGDR* *Ôsaka gaikokugo daigaku ronshû* (*Journal of Osaka University of foreign studies, new series*).
- OGK* *Onseigakkai kaihô* (*Bulletin of the Phonetic society of Japan*) (Tôkyô).
- OK* *Onsei no kenkyû* (*The study of sounds*) (Tôkyô).
- ÖMBDS* *Öbör Monggol-un bagsi-yin degedü surgaguli-yin erdem sinjilegen-ü sedgül* (Kökeqota).
- ÖMBYS* *Öbör Monggol-un bagsi-yin yeke surgaguli-yin erdem sinjilegen-ü sedgül* (Kökeqota). (Continuation of *ÖMBDS* after 1982/3.)
- ÖMSK* *Öbör Monggol-surgen kömüjil-ün keblel-ün qoriy-a.*
- ÖMÜBDS* *Öbör Monggol-un ündüsüten-ü bagsi-yin degedü surgaguli, erdem sinjilegen-ü sedgül: gün uqagan neyigem sinjilekü uqagan-u Monggol keblel* (*Journal of social sciences, Inner Mongolia teachers' college of the nationalities, Mongolian edition*) (Töngliáo).
- ÖMÜYS* *Öbör Monggol-un ündüsüten-ü yeke surgaguli, erdem sinjilegen-ü sedgül: neyigem-ün sinjilekü uqagan-u keblel* (*Journal of Inner Mongolia University for nationalities: social sciences, Mongolian edition*) (Töngliáo). (Continuation of *ÖMÜBDS*, 2001–).
- ÖMYSS* *Öbör Monggol-un yeke surgaguli-yin erdem sinjilegen-ü sedgül: gün uqagan neyigem sinjilekü uqagan* (Kökeqota). (Mongolian edition. From 1991 the title is given in English as *Journal of Nei Mongol University: philosophy and social sciences in Mongolian*; 1992/4 changed to *Journal of Inner Mongolia University: philosophy and social sciences in Mongolian*.)
- OShKR* *Ozawa Shigeo kyôju taikan kinen ronbun to omoide no ki* (Tôkyô: Jichôsha). 1993.
- ÖT* *Ögülel-ün tegübüri* ([Xiníng]: Dumdadu Ulus-un Monggol kele bicig-ün sinjilegen-ü neyigemlig-ün Kökenagur qubiyari neyigemlig).
- OUMÈ n IH* *Olon ulsyn mongolč èrdëmtñij n ih hural* [*n-th International congress of Mongolists*] (Ulaanbaatar).
- PIAC 12* Hazai, György and Peter Zieme (eds.) (1974), *Sprache, Geschichte und Kultur der Altaischen Völker* (*Schriften zur Geschichte und Kultur des alten Orients*, 5) (Berlin: Akademie-Verlag).
- PIAC 14* Ligeti, Lajos (ed.) (1975), *Researches in Altaic languages* (Budapest: Akadémiai Kiadó).

- PIAC 25 Jarring, Gunnar and Staffan Rosén (eds.) (1984), *Altaistic studies: papers presented at the 25th meeting of the Permanent international Altaistic conference at Uppsala June 7–11 1982* (Stockholm: Almqvist & Wiksell).
- PIAC 29 *Istoriko-kul'turnye kontakty narodov altajskoj jazykovoj obšnosti: tezisy dokladov XXIX sessii postojannoj meždunarodnoj altaističeskoj konferencii (PIAC). II: lingvistika* (Moskva: AN SSSR). 1986.
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- PIAC 38 Stary, Giovanni (ed.) (1996), *Proceedings of the 38th Permanent international Altaistic conference* (Wiesbaden: Harrassowitz).
- PIAC 39 Berta, Árpád (ed.) (1997), *The historical and linguistic interaction between Inner-Asia and Europe: proceedings of the 39th Permanent international Altaistic conference (Studia Uralo-Altaica, 39)* (Szeged: University of Szeged).
- PIAC 41 Janhunen, Juha and Volker Rybatzki (eds.) (1999), *Writing in the Altaic world (Studia orientalia, 87)* (Helsinki).
- RAN Rossijskaja Akademija nauk [Russian Academy of sciences].
- SO Sibirskoe otdelenie [Siberian division].
- StMo *Studia Mongolica (Mongolyn sudla)* (Ulaanbaatar). (After eight volumes, the issues were renumbered from 1, but both the old and new numbers are printed in each volume. In this bibliography, this is shown as e.g. StMo 10(18), i.e. number 10 in the new series = number 18 in the old series. After StMo 13(21), the series changed name to *Mongolica*, again with both the new and old number printed in the book, indicated in this bibliography as e.g. *Mongolica* 2(23).)
- ŠUA Šinžlex uhaany akademii [Academy of sciences].
- ŠUAM Šinžlex uhaany akademij mèdèè [Bulletin of the Academy of sciences] (Ulaanbaatar).
- SUS Suomalais-ugrilainen seura (Société finno-ougrienne) (Helsinki).
- SUST *Suomalais-ugrilaisen seuran toimituksia* (Mémoires de la société finno-ougrienne) (Helsinki).
- TBION *Trudy Burjatskogo instituta obšestvennyh nauk* [Working Papers of the Buriad institute of social sciences] (Ulan-Udë). (Special volumes: 2 *Issledovanie burjatskih govorov*, 2 (1968); 13 *Materialy po istorii i filologii Central'noj Azii*, 5 (1970); 27 *Issledovaniya po istorii i filologii Central'noj Azii* (1976); 29 *Sibirskij fonetičeskij sbornik* (1976).)
- TBurNII *Trudy Burjatskogo kompleksnogo naučno-issledovatel'skogo instituta* (Ulan-Udë: SO AN SSSR). (Special volume: 17 *Issledovanie burjatskih govorov*, 1 (1965).)
- TPV *Teoretičeskie problemy vostočnogo jazykoznanija* [Theoretical problems in oriental linguistics], 5 (Moskva: Nauka). 1982.
- UAJb *Ural-Altaische Jahrbücher* (24–52 Wiesbaden; 53–4 Berlin).
- UAJb NF *Ural-Altaische Jahrbücher; neue Folge* (Wiesbaden).
- VBF *Voprosy burjatskoj filologii* (Ulan-Udë: Burjatskij gosudarstvennyj pedagogičeskij institut imeni Dorži Banzarova).
- VGS *Voprosy grammatičeskoj sistemy Mongol'skih jazykov* [Problems about the grammatical system of Mongolian languages] (Elista: KNIIIFÈ). 1980.
- VJa *Voprosy jazykoznanija* (Moskva).
- VLU *Vestnik Leningradskogo universiteta* (Leningrad).

WPLund	<i>Working papers (Department of linguistics, Lund University).</i>
XMY	<i>Xibei mínzú yánjiū</i> (North west minorities research) (Láñzhōu).
ZASB	<i>Zentralasiatische Studien</i> (Wiesbaden).
ZBurNII	<i>Zapiski Burjat-Mongol'skogo naučno-issledovatel'skogo instituta kul'tury</i> (Ulan-Udè).
ZDMG	<i>Zeitschrift der Deutschen Morgenländischen Gesellschaft.</i>
ZKEL	<i>Bičvr; (Učeny) Zapiski</i> (Èlista: KNIIJaLI).
ZSMY	<i>Zhōngguó shǎoshù mínzú yúyán</i> [The languages of the minority peoples in China] (Chéngdū: Sichuān mínzú).
ZY	<i>Zhōngguó yǔwén</i> (Běijīng).

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