## DESCRIBING AND TRANSCRIBING
## THE PHONOLOGIES OF THE AMDO SPRACHBUND

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The Amdo Qinghai region, at the frontier of Tibet and China, comprises languages belonging to three genetic language families (Sino-Tibetan, Turkic, and Mongolic), three typological orientations (Sinitic, Bodic, and Altaic), and approximately 20 separate languages. These languages have undergone profound interaction at all levels of linguistic structure and substance in the context of what may be called the Amdo Sprachbund (Janhunen 2012), also known as the Qinghai-Gansu Sprachbund (Slater 2003) or the Qinghai Linguistic Complex (Janhunen 2007). Within the Amdo Sprachbund, several historical processes have taken place that have contributed to the transformation of the original typological orientations of the participating languages. We may speak of Altaicization (of the local varieties of Chinese), Tibetanization (of the local varieties of Turkic and Mongolic, and some varieties of Chinese), as well as of Sinicization (of some of the local varieties of Mongolic).

The present paper will discuss the impact of the Amdo Sprachbund on the phonological structures of the languages of the Amdo Qinghai region. Due to their interaction, the phonological systems of the languages concerned show a number of region-specific features, some of which are rare, even on a global scale. A separate, but related, issue is concerned with the challenge these systems provide for phonological notation in terms of a unified Roman transcription. The present paper will argue that for technical purposes it is convenient to use a system of Romanization based on the Pinyin system of Chinese. To some extent, the Romanization may be anchored in the practical orthographical notation already used for some of the local languages. For the purposes of literacy and native language use it is, however, also important to rely on local cultural traditions, which means the use of the Chinese, Tibetan, and Arabic scripts.

Within the Amdo Sprachbund there is a certain chronological layering of different typological orientations, in that most languages of the region seem to share a basic and possibly locally very ancient Altaic typology, reflected, among other things, in a systematic SOV word order as well as in a complex system of suffixal morphology, comprising markers for both nominal (number, case) and verbal (nominalization, converbialization) categories. As far as their synchronic phonologies are concerned, however, the extant languages of the Sprachbund represent either a Bodic or a Sinitic orientation. A common feature of these two orientations is the important role played by the syllable in the phonological structure. Thus, languages of both the Bodic and the Sinitic type show very different phoneme paradigms for the different phonotactic slots of the syllable. Maximally, it is possible to distinguish between the following slots: preinitial (H), initial (C), medial (M), vowel (V), final (F), as well as, marginally, postfinal (S).

The most complex syllable type with as many as five slots filled (HCMVF) is attested in several languages of the Bodic type, while languages of the Sinitic type normally leave the preinitial slot empty and have maximally only four slots filled (CMVF). The Sinitic syllable is, however, complicated by the presence of tones, though tones in the Sinitic languages spoken in the Amdo Qinghai region can also be absent, as in Wutun, or considerably reduced, as in most mainstream varieties of Northwest Mandarin, which have maximally three distinctive tones. On the other hand, the original Altaic syllable type, as still attested in most languages of the Altaic typology elsewhere in Central and North Asia, is generally much simpler and comprises normally only three segments (CVF), though marginally a medial can also be present (CMVF). None of the non-Sinitic languages of the Amdo Qinghai region has been shown to possess distinctive tonal phenomena, although it has been claimed that secondary suprasegmental distinctions have arisen in some of the local Mongolic idioms, notably Jishishan Bonan (Li 1986) and Minhe Mangghuer (Dwyer 2008).

As far as the segmental structure of the syllable is concerned, however, the Turkic and Mongolic languages of the Amdo Sprachbund have adapted to the locally dominant Bodic and Sinitic phonologies. In some cases, as in the case of Minhe Mangghuer and Jishishan Bonan, it is possible to distinguish between a primary Tibetanization and a secondary Sinicization of the phonological system, while in other cases only either Sinicization, as in Santa, or Tibetanization, as in Tongren Bonan, is present. In general, it may be said that the Bodic phonologies in the region are segmentally more complicated, in that they comprise more distinctions in both the horizontal (places of articulation) and vertical (manners of articulation) directions. They also typically contain initial clusters, composed of an initial and a preceding preinitial, which can variously yield monophonemic entities that additionally complicate the segmental paradigm.

## THE ISSUE OF NOTATION AND ORTHOGRAPHY

There are only two fully developed written languages used in the Amdo Qinghai region: Written Tibetan and Written Chinese, of which the latter is today represented by the Standard Mandarin literary norm (Putonghua), but earlier also by various stages of Classical Chinese. Neither of these languages is strictly speaking native to the region, though both have been used for centuries for both documentational and educational purposes. Additionally, Written Mongol and Written Arabic have been used, and are still being used, in the region, though both may be classified as secondary to the populations that use them. Written Mongol functions today as the literary medium for several Oirat-speaking groups in Amdo, while Arabic is only used as a foreign language in connection with Quranic studies by the Muslim populations with Sinitic, Mongolic or Turkic vernaculars.

All the other languages in the region are traditionally unwritten. However, in recent decades, a semi-norm has been created for Amdo Tibetan, the principal dialectal complex of Tibetan in the region. This norm, which functions in the Tibetan script, combines

features of the Written Tibetan orthography with regional dialectal lexical, morphological and phonological idiosyncracies. Amdo Tibetan may today be viewed as a new Tibetan-based literary language, similar, for instance, to Dzongkha in Bhutan and Bhutia in Sikkim. It should be noted, however, that the Amdo Tibetan semi-norm omits several non-Amdo varieties of Tibetan also present in the region, especially in the Jone (Zhuoni) area in present-day southern Gansu and adjacent parts of Sichuan.

On a different basis, experimental Romanized orthographies and literary norms have been created for some languages of the region, notably Huzhu Mongghul and Minhe Mangghuer, the two principal varieties of 'Monguor' (Tu), but also for Santa (Dongxiang). Importantly, all of these new literary languages apply the principles of the Pinyin Romanization for Chinese, with the necessary modifications. This may be seen as a strategically wise choice, since the Pinyin system is today the main form of Roman script familiar to the local populations speaking non-Chinese languages. Although in scholarly publications the transcription system of the International Phonetic Association (IPA) still dominates, its application to the languages of the Amdo Sprachbund is not always consistent (and sometimes even mistaken). There are many reasons why, at least for the purposes of phonological description, the Pinyin system is the most practical choice even in scholarly publications. This choice will be adopted below.

It has to be noted, however, that some of the aboriginal populations of the Amdo Qinghai region gain literacy in either Tibetan or Arabic, and the choice of these scripts could well be defended for the purposes of practical orthographies. In fact, the Arabic script has been marginally used for writing Santa (Suutarinen 2013), while experimentations have been made to apply the Tibetan script for Wutun, which, although genetically a Sinitic language, is spoken by a population with a Tibetan ethnic identity (Janhunen 2009). Even the Chinese script would be a natural choice for literacy for the speakers of the mainstream forms of Northwest Mandarin, though it seems that in these cases the development is inevitably leading to the full replacement of these idioms by Standard Mandarin.

The paradigms of segments occurring in the slot of the initial consonant (C) in the languages of the Amdo Sprachbund are probably most conveniently described in terms of four primary and four secondary vertical columns, corresponding, roughly, to four to eight different places of articulation. The four primary places of articulation are present in the nasals, which are typically divided into a labial (*m*), a dental (*n*), a laminal or palatal (*ny*), as well as a velar (*ng*) segment (Table 1).

Table 1. Nasal initials.

| *m* | *n* |  |  | *ny* |  | *ng* |  |
|-----|-----|--|--|------|--|------|--|

The four additional places of articulation are present in the strong stops, which can have a sibilant (*c*), a retroflex (*ch*), and a distinctively palatal (*qh*) segment, as well as a postvelar segment (*kh*). The realizations of the sibilant, retroflex, laminal, and palatal stops involve also manner features, in that they are normally pronounced as affricates containing a homorganic stop + a fricative phase. Even so, in the matrix of initial consonants they are best placed in separate vertical columns (Table 2).[1]

Table 2. Strong stop initials.

| *p* | *t* | *c* | *ch* | *q* | *qh* | *k* | *kh* |
|-----|-----|-----|------|-----|------|-----|------|

In practice, the postvelar stop is rare in the region and may even be synchronically questionable in some cases, being attested mainly in the restricted subarea comprising Minhe Mangghuer, Santa, and Salar. The distinction between laminals and palatals is also not universal in the region, being only present in several, but not all,

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[1] The present paper will not go into the deeper phonetic implications of the terms used to classify the phonemic distinctions. In most cases, these terms follow the traditional understanding of articulatory phonetics, but due to the diversity of distinctions in the Amdo region some concepts might actually require more elaboration in the future. Note, for instance, that laminality, though used here, is a potentially disputable concept (on it, cf. e.g. Ladefoged and Madison 1996:23-25).

varieties of Amdo Tibetan as well as in a few areally contiguous languages, notably Wutun. Elsewhere, including in many Amdo Tibetan dialects, laminals and palatals are represented by one single column of what may be termed basic palatal stops. In the notation, it is practical to use the regular Pinyin convention (*q*) for the laminal column, which more or less corresponds to the pronunciation of this type of segment in Standard Mandarin, while the palatal column, if present, will have to be expressed in terms of a specific digraph (*qh*).

A similar range of distinctions is present in the weak stops (Table 3), except that the postvelar weak stop (*gh*) is paradigmatically ambiguous and may also be understood as the velar member of the weak fricative series (as discussed below). In fact, this segment is in most idioms pronounced with frication, which can even, as in many Amdo Tibetan dialects, result in pronunciation as a uvular trill [ʀ]. Otherwise, the distinction between strong and weak stops is universally present in the region and is typically realized in terms of aspiration (unvoiced aspirated vs. unvoiced unaspirated), with no phonetic voicing contrast involved. This is because voicing as a phonetic and phonemic feature is connected with the system of initial clusters (as also discussed below).

Table 3. Weak stop initials.

| *b* | *d* | *z* | *zh* | *j* | *jh* | *g* | *gh* |
|---|---|---|---|---|---|---|---|

The 8-column-structure of the stop system is itself rare among the languages of the world. In the Amdo region, however, this system is also present in the strong continuant obstruents, or voiceless fricatives (Table 4). This series typically comprises a dentilabial (*f*), a fricolateral (*lh* = [ɬ]), an aspirated dental sibilant (*s* = [sʰ]), a retroflex sibilant (*sh* = [ʂ]), a laminal sibilant (*x* = [ɕ]), a palatal fricative (*xh* = [ç]),]), a velar fricative (*h* = [x]), and a postvelar or laryngeal spirant (*hh* = [h]). Instead of the palatal fricative, many idioms of the region, including 'standard' Amdo Tibetan, exhibit the universally rare sound of a dorso-palatal approximant [ɦ], though, on the other hand, the distinction between the laminal and palatal columns (*x* vs. *xh*) can be dialectally neutralized. The distinction between the velar and postvelar columns (*h* vs. *hh*) is also not

universally present and is represented by a single velar to laryngeal segment in most idioms in the region. As far as the notation is concerned, there is already some tradition to mark the non-sibilant dental (*lh*), palatal (*xh*) and postvelar (*hh*) segments with non-standard digraphs, which are also used, when required, in the Roman orthographies of the languages concerned.

Table 4. Strong continuant initials.

| *f* | *lh* | *s* | *sh* | *x* | *xh* | *h* | *hh* |
|-----|------|-----|------|-----|------|-----|------|

It has to be added that Tibetan originally had two dental sibilants, expressed in Written Tibetan by the letters <s> vs. <z>, whose phonetic difference in Amdo Tibetan is basically one of aspiration, with both segments being unvoiced, i.e., [sʰ] vs. [s]. This distinction based on aspiration in the dental sibilants has no natural place in the phonological system, for which reason it is very commonly lost both in Amdo Tibetan dialects and in other local languages with a Bodic phonological orientation. The distinction between the segments *xh* and *x* is originally of a similar type, Written Tibetan <sh> vs. <zh>, but it has been integrated into the system of strong continuant initials and need not, for that reason, be eliminated (even though it is also synchronically absent in many idioms).

Finally, there is a series of corresponding weak continuants, or weak fricatives alias spirants, all of which are inherently voiced (Table 5). This system is phonetically and diachronically of heterogeneous origin and comprises a labial (*w*) and a palatal (*y*) segment which could also be classified as glides, a voiced dental lateral (*l*), and a retroflex rhotic with or without vibration (*r*), voiced dental (*ss*), and laminal (*xx*) sibilants, as well as a voiced velar to postvelar fricative (*gh*), which can also be pronounced as a uvular trill, and which can also be classified as the postvelar member of the weak stop series (see above). The adherence of the lateral (*l*) to the obstruent system is an important, though not a universally unique, feature characteristic of the phonologies of the Amdo Sprachbund. No language in the region seems to have a distinctive segment in the postvelar column in this series. Note that in a Pinyin-based

phonological notation, special digraphs (here doubled letters) have to be used for the voiced dental and laminal sibilants (*ss* and *xx*).

Table 5. Weak continuant initials.

| w | l | ss | r | xx | y | gh | |
|---|---|----|---|----|---|----|--|

What makes the matrix of initial consonants in the Amdo Sprachbund special in a global context is its extreme compactness: of the theoretically available 5 x 8 = 40 slots in the system up to thirty-four can be filled (Table 6). In practice, no single idiom in the region has all these segments in a synchronically coherent system. Most commonly absent are the postvelar strong stop (*kh*) and the palatal stops (*qh, jh*), but depending on the language several other segments, for instance, the palatal nasal (*ny*) and the voiceless fricolateral (*lh*) can also be absent as independent phonemes. In general, the systems with a Sinitic orientation exhibit a smaller number of segmental distinctions than those with a Bodic orientation (cf. Janhunen 2006), but this does not correlate with the genetic origin of the languages. For instance, Wutun, which is genetically Sinitic, is phonologically Bodic and has an almost complete matrix of distinctions in its synchronic system.

Table 6. Complete matrix of initial consonants.

| m | n |    |    | ny |    | ng |    |
|---|---|----|----|----|----|----|----|
| b | d | z  | zh | j  | jh | g  |    |
| p | t | c  | ch | q  | qh | k  | kh |
| f | lh | s | sh | x  | xh | h  | hh |
| w | l | ss | r  | xx | y  | gh |    |

THE SYSTEMS OF INITIAL CLUSTERS

The voiced dental and laminal sibilants (*ss* and *xx*), in those languages that have them, are diachronically connected with the presence of preinitials. Since the latter are typically a feature of Bodic phonology, they are present only in languages of a Bodic orientation.

Originally, Tibetan could have as many as five distinct preinitials, including a sibilant (*s*), a lateral (*l*), a retroflex (*r*), a labial obstruent (*b*), an archiphonemic obstruent (*d/g*), a labial nasal (*m*), and an archiphonemic nasal (*v*). In most varieties of Amdo Tibetan, and apparently in all non-Bodic languages of the Amdo Sprachbund, these are represented as a residual system comprising only the features of prenasalization (N), preaspiration (H), and preglottalization (Q) (Kalsang Norbu and Janhunen 2000: 261-269).

Prenasalization is synchronically present only before a single series of stop obstruents, which in this position are pronounced as voiced and may be paradigmatically identified as the weak series (*b*, *d*, *z*, *zh*, *j*, *jh*, and *g*), implying that this series is also inherently unmarked as compared with the strong series (phonemically marked and phonetically aspirated). The system of prenasalized stops comprises maximally seven members, with a diachronically conditioned empty slot in the postvelar column (Table 7). Prenasalization is conveniently expressed in the notation by the letter <v>, as used for archiphonemic nasalization also in the modified Wylie system for Written Tibetan (Balk 2005). As long as the system has also other preinitials, the prenasalization element is best analysed as a separate segment, meaning that we are dealing with initial clusters of archiphonemic nasal + stop. Alternatively, it would be possible to analyse these clusters as a separate set of monophonemic prenasalized initial consonants, which would correspondingly increase the paradigm of initials.

Table 7. Prenasalized stops.

| *vb* | *vd* | *vz* | *vzh* | *vj* | *vjh* | *vg* | |
|------|------|------|-------|------|-------|------|--|

Preaspiration is likewise attested before a single series of stop obstruents, which in this position are pronounced as voiceless but without aspiration, and which may paradigmatically be identified with the presumably unmarked weak series. In the notation, preaspiration can be conveniently expressed by the letter <h>. Preaspiration can, however, also be present before the nasals (*m*, *n*, *ny*, and *ng*), which in this position can become slightly or even fully devoiced. Thus, the system can have maximally eleven sequences

with preaspiration. These are probably best analysed as initial clusters, though it would also be possible to operate with a set of separate monophonemic preaspirated stops and voiceless nasals.

Table 8. Preaspirated nasals and stops.

| *hm* | *hn* | | | *hny* | | *hng* | |
|---|---|---|---|---|---|---|---|
| *hb* | *hd* | *hz* | *hzh* | *hj* | *hjh* | *hg* | |

Finally, preglottalization is, again, attested before a single series of stop obstruents, which in this position are pronounced as voiced, and which may be identified with the unmarked weak series of stops. The preglottalization element itself is normally lost as a segmental feature, leaving only a set of voiced initial stops. These could conveniently be analysed as monophonemic entities were it not that preglottalization is also attested before the segments *l* and *y* of the weak continuant series, in which case the glottal element is often segmentable as a specific voiced onset. Thus, preglottalization is maximally attested in 9 sequences (Table 9). In the notation, preglottalization, as well as the phonetically observable feature of voicing, may be expressed by letter doubling, a convention already established in Chinese minority language studies.

Table 9. Preglottalized stops and continuants.

| *bb* | *dd* | *zz* | *zzh* | *jj* | *jjh* | *gg* | |
|---|---|---|---|---|---|---|---|
| | *ll* | | | *yy* | | | |

In most idioms of the Amdo Sprachbund, the relatively complex system of initial clusters has been simplified in a number of ways. Most obviously, the preglottalized continuants *ll* and *yy* (occurring only in a few diachronically conditioned Tibetan lexical items) are marginal to the system, and their distinction with regard to the simple *l* and *y* is widely neutralized. Also, the distinction between the regular and the preaspirated nasals is commonly lost, leaving preaspiration as a feature of stops only. After these reductions, the typical system of initial clusters will only comprise the full sets of prenasalized, preglottalized and preaspirated stops (Table 10). This is the system attested in, for instance, Wutun, and it would be

synchronically possible to analyse these clusters as monophonemic prenasalized, voiced, and preaspirated consonants.

Table 10. Reduced system of initial clusters.

| vb | vd | vz | vzh | vj | vjh | vg |  |
|----|----|----|-----|----|-----|----|--|
| bb | dd | zz | zzh | jj | jjh | gg |  |
| hb | hd | hz | hzh | hj | hjh | hg |  |

The reduction of the system can proceed even further, in which case preaspiration can lose its distinctiveness, leaving only the basic set of unmarked stops (*b*, *d*, *z*, *zh*, *j*, *jh*, and *g*). At the same time, the distinction between prenasalization and preaspiration can be lost, resulting in a single series of voiced stops, which can variously be pronounced with or without a nasal onset. This seems to be the synchronic situation for, for instance, many younger speakers of Wutun. In such an idiom, we are definitely dealing with only three sets of monophonemic stops: one basic unmarked unaspirated and unvoiced (*b*, *d*, *z*, *zh*, *j*, *jh*, and *g*), another distinctively voiced (*bb*, *dd*, *zz*, *zzh*, *jj*, *jjh*, and *gg*), and a third distinctively (post)aspirated (*p, t, c, ch, q, qh*, and *k*) (Table 11).

Table 11. Simplified system of initial stops.

| b  | d  | z  | zh  | j  | jh  | g  |  |
|----|----|----|-----|----|-----|----|--|
| bb | dd | zz | zzh | jj | jjh | gg |  |
| p  | t  | c  | ch  | q  | qh  | k  |  |

On the other hand, we have to recall that some, in this respect 'archaic', languages and dialects of the Amdo Qinghai region still have a larger paradigm of preinitials. A case in point is Huzhu Mongghul, which has the distinctive retroflex preinitial *r*. The latter can, moreover, occur both before the weak obstruents, in which position it has the phonetic value of a voiced retroflex approximant [ɻ], and before the strong obstruents, in which position it has the phonetic value of a voiceless retroflex sibilant [ʂ], meaning that the two series of stops can contrast after this particular preinitial (*rg* [ɻg] vs. *rk* [ʂk] etc.). A similar system is present in several Amdo Tibetan dialects.

Compared with the systems of initials and initial clusters, the distinctive potential of medials, finals, and main vowels is considerably more restricted. Most languages of the Amdo Sprachbund seem to have a system of five vowels, comprising two rounded back vowels (*u* and *o*), two unrounded back vowels (*e* and *a*), and one high unrounded front vowel (*i*). Many forms of Amdo Tibetan have, however, only one distinctive round vowel, resulting in a system of four vowels (*u*, *i*, *e*, and *a*), while other languages, like Wutun, have an additional non-high front vowel (*ai* = [e]), yielding a symmetric rectangular system of six vowels (Table 12). This system can be further expanded by two long or tense high vowels, which, however, can also be analysed as sequences of two segments (*uu* and *ii*).

Table 12. Complete paradigm of basic vowels.

| *u* | | | | | *i* | *e* | |
|---|---|---|---|---|---|---|---|
| *o* | | | | | *ai* | *a* | |

The vowels are in a direct phonetic relationship with three places of consonantal articulation: labial, palatal and velar, and the high vowels (*u*, *i*, and *e*) may simply be seen as the vocalic counterparts of the corresponding weak continuant consonants (*w*, *y*, and *gh*), which may also be classified as glides. The other weak continuants (*l*, *ss*, *r*, and *xx*) do not normally have vocalic counterparts in the languages of the Amdo Sprachbund, though such vowels (at least sibilant and retroflex) are present elsewhere in East Asia.

Finals are originally a category paradigmatically similar to that of preinitials, and some forms of Amdo Tibetan do, in fact, preserve as many as eight distinct finals, comprising three nasals (*m*, *n*, and *ng*), three obstruents (*b*, *d*, and *g*) and two continuants (*l* and *r*). In most languages of the region, however, the system of finals is much simpler and comprises in the extreme case only one archiphonemic nasal and one archiphonemic non-nasal. The nasal final is then realized variously as either a dental or a velar segment, or

also as the nasalization of the preceding vowel. For practical purposes, it is convenient to use the standard Pinyin finals *n* and *ng* in combination with different vowel letters even when the two finals stand for a single nasal final phoneme (Table 13).

Table 13. Vowels with a nasal final.

| un | | | | | in | en | |
|-----|---|---|---|---|-----|------|---|
| ong | | | | | an | ang | |

The non-nasal final is typically combined with a substantially reduced paradigm of vowels, comprising only two (as in many forms of Amdo Tibetan) or three (as in Wutun) distinct segments. The final itself is realized as a velar to postvelar to uvular stop or continuant, which can also be phonetically very weak. For reasons of tradition and convenience it is perhaps best written as *k* in the phonemic notation (Table 14). It may be noted that vocalic finals related to the labial and palatal glides (*w* and *y*), as commonly attested in many forms of Chinese, are generally absent in the Amdo Sprachbund.

Table 14. Vowels with a non-nasal final.

| ok | | | | | ak | ek | |
|----|---|---|---|---|----|----|---|

The role of medials (M) is also very limited in the languages of the Amdo Sprachbund. Although sequences comprising either the labial (*w*) or the palatal (*y*) glide, or the corresponding high vowels (*u* and *i*), between the initial consonant (C) and the main vowel (V) are attested in most languages of the region, they are not a central feature of the local phonologies. For diachronic reasons, they are more important in the Sinitic than in the Bodic languages, though their role has been decreased by neutralizing processes on the Sinitic side, while they have arisen also independently on the Bodic side.

For paradigmatic and segmental phonology, the most important implication of medials is perhaps connected with the role that the labial medial (*w*) can play in connection with the velar column of initials. In many idioms of the Amdo Sprachbund, the labial medial occurs either predominantly or solely after initials of the velar column. In such idioms, the resulting sequences could also be

interpreted as monophonemic labiovelar segments. One possible outcome would be a system that has a complete set of labiovelars beside the regular velars. In such a system, the three columns of vowels would be naturally associated with the palatal, velar, and labiovelar columns of the consonants, respectively (Table 15).

Table 15. Integrated system of segments.

| m | n | | | ny | | ng | |
|---|---|---|---|---|---|---|---|
| bb | dd | zz | zzh | jj | jjh | gg | ggw |
| b | d | z | zh | j | jh | g | gw |
| p | t | c | ch | q | qh | k | kw |
| f | lh | s | sh | x | xh | h | hw |
| w | l | ss | r | xx | y | gh | ghw |
| | | | | | i | e | u |
| | | | | | ai | a | o |

Ultimately, the two-dimensional representation of phonological paradigms in terms of a rectangular matrix of the traditional type (Tables 1 to 15) is misleading. A better picture of the interrelationships between the members of the paradigm would be gained with a model organized cylindrically, or perhaps spherically. The elaboration of such a model remains, however, outside the scope of the present discussion, which is only concerned with the basic taxonomy of the phonological distinctions present in the languages of the Amdo Sprachbund.

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