Phonological features of Yazghulami
A field study

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Abstract

Yazghulami is a South-East Iranian language spoken in the Pamir area of Tajikistan by about 9000 people. This study gives an account of the phonology of the language by describing contrastive segments and their distribution and realizations, as well as describing suprasegmental features such as syllable structure and stress patterns. Field research was carried out in a community of Yazghulami speakers in Dushanbe, the capital of Tajikistan, by recording, transcribing and annotating spoken language. Yazghulami is analyzed as having 8 vowel phonemes of which one pair contrasts in length, and 36 consonant phonemes with a considerable display of palatal, velar and uvular phonemes, of which a set of three labialized plosives and three labialized fricatives is found. The syllable structure of Yazghulami allows for clusters of no more than two consonants in the onset and two in the coda; clusters in both positions do not occur in one and the same syllable. The stress generally falls on the last syllable of a word, although when nouns are inflected with suffixes, the stress instead falls on the last syllable of the stem. With these results, a foundation for further efforts to develop and increase the status of this endangered language is laid.

Keywords
Pamir languages, Tajikistan, Segmental phonology, South-East Iranian, Yazghulami
Fonologiska drag i yazghulami

En fältstudie

Matilda Narin

Sammanfattning


**Keywords**
Pamirspråk, Tadzjikistan, Segmentell fonologi, Sydöst-iranska, Yazghulami
List of abbreviations

1PL  1st person plural
2PL  2nd person plural
3PL  3rd person plural
1SG  1st person singular
2SG  2nd person singular
3SG  3rd person singular
ADJ  Adjective
ASP  Aspect
CONN Connective
IMP  Imperative
INF  Infinitive
INTR Intransitive
N    Noun
OBJ  Object
PL   Plural
POSS Possessive
PRS  Present
PST  Past
SBJ  Subject
TJ   Tajik
V    Verb

Acknowledgements

This project has led to a number of new connections and friendships, for which I am more than grateful:

To my host family in Dushanbe for letting me into their life and their home, for patiently talking to me in their own language and enabling all kinds of conversations, for introducing me to their extended family, friends and neighbours, and for making me feel welcomed in a place that could have felt foreign.

To Ranodegim Gavasova and Sitora Sardorova who worked with me through this project and without whom the collecting of data and my understanding of it would not have been possible; and to Ranodegim and her husband for taking me to the unforgettable Yazghulom valley.

To the Merritt family for introducing me to the Tajik society, for their hospitality, for checking on me and providing me with coffee.

To my supervisor Henrik Liljegren for making it possible for me to go on this journey, and for patiently suggesting revisions.

Thank you!
Contents

1 Introduction .................................................................................................................. 1
  1.1 The language and its speakers ............................................................................. 1
  1.2 Previous research ................................................................................................. 2
  1.3 Theoretical prerequisites ..................................................................................... 5

2 Method .......................................................................................................................... 6
  2.1 The setting ............................................................................................................ 6
  2.2 Data collection ..................................................................................................... 6
    2.2.1 Consultants .................................................................................................. 6
    2.2.2 Material ...................................................................................................... 6
    2.2.3 Data processing and software ...................................................................... 8
  2.3 Data analysis ......................................................................................................... 8

3 Results .......................................................................................................................... 10
  3.1 Vowels .................................................................................................................. 11
    3.1.1 Contrast ...................................................................................................... 11
    3.1.2 Distribution ................................................................................................. 12
    3.1.3 Variation ..................................................................................................... 13
  3.2 Consonants ........................................................................................................... 14
    3.2.1 Plosives ...................................................................................................... 14
    3.2.2 Fricatives ................................................................................................... 18
    3.2.3 Affricates ................................................................................................... 22
    3.2.4 Nasals .......................................................................................................... 24
    3.2.5 Approximants .............................................................................................. 25
    3.2.6 The lateral approximant and the trill .......................................................... 26
    3.2.7 Contrast in manner of articulation ................................................................ 27
  3.3 General phonological processes ........................................................................... 27
  3.4 Suprasegmentals ................................................................................................... 28
    3.4.1 Syllable structure ......................................................................................... 28
    3.4.2 Word stress .................................................................................................. 29

4 Discussion .................................................................................................................... 31
  4.1 Discussion of method ........................................................................................... 31
  4.2 Discussion of results ............................................................................................ 32
  4.3 Conclusion ............................................................................................................. 33

References ....................................................................................................................... 35

Appendix A ....................................................................................................................... 37
Appendix B ....................................................................................................................... 39
1 Introduction

The purpose of this study is to describe the phonology of Yazghulami, a South-East Iranian language (Payne 1987:514) spoken in Tajikistan in Central Asia. The description will include a) an account of the relationship between phones that are phonetically similar, i.e. if they stand in contrast, complementary distribution or free variation to each other, and in that way present a phoneme inventory of this language; and b) an account of suprasegmentals such as the syllable structure and stress on word level in Yazghulami.

For the present study, three months of field research have been carried out in the Yazghulami-speaking community in Dushanbe, the capital of Tajikistan. The language and the background of this study will be described below, followed by a presentation of the field trip, data collection and analysis of the material. Thereafter, a presentation of the results will be given, followed by a discussion on these results as well as on the study as a whole.

1.1 The language and its speakers

Yazghulami is spoken in the Yazghulom valley in the mountainous Gorno-Badakhshan Autonomous Province in Tajikistan, which is located in the Pamir Mountains, presented in Figure 1 below. The language has, according to an estimation made in year 2003, approximately 9000 speakers (Tiessen et al. 2010:6), and is, according to UNESCO, severely endangered (Wurm (ed.) 2001:36). Communities of Yazghulami speakers are also found in Dushanbe and Moscow, consisting of about 130 and 90 homes respectively (Tiessen et al. 2010:6). The speakers themselves call their language zjami, and apart from Yazghulami, other alternative names are Yazghulomi, Yazgulyam, Yazgulyami, Yazgulam, and Iazgulem; and the language’s ISO code is yah (Lewis et al. 2016). Previous research (presented in 1.2 below) describes the basic phonology, morphology and syntax of Yazghulami as well as the bilingualism of the speakers, but the language is still to be regarded as under-described.

The Yazghulami speakers are generally multilingual, speaking both Tajik and Russian in addition to Yazghulami. In 2003, Tiessen et al. (2010) carried out a survey in the Yazghulom valley to describe the use of Tajik among the Yazghulom speakers. They found that Tajik and Yazghulami are used in different domains, where Yazghulami is used in inter-personal communication in the homes and out in the Yazghulom valley, and also with local staff in official contexts in local administration. Both Yazghulami and Tajik are used in school, especially in the lower grades and in the schoolyard between pupils, as well as in the mosques where Yazghulami can be used to explain certain issues. Tajik is used in reading and writing, when watching television and listening to radio, as well as in most official contexts, and with guests speaking Tajik (Tiessen et. al 2010:9–11). The proficiency in Tajik seems to differ between men and women, where Yazghulami men generally have a higher degree of proficiency than Yazghulami women. Tiessen et al. (2010:25) claim that men often have high or full proficiency in Tajik, and that it coincides with a higher degree of education. The high proficiency in the Tajik language is normally attained during longer periods of studies outside of the Yazghulom valley, periods that function as Tajik language immersion. It is not as common for women to experience such immersions, as they generally have a lower degree of education, and therefore do not become as
proficient in Tajik. To what extent Russian is used and what level of proficiency Yazghulami speakers have of Russian has not been researched, but it is plausible that the Yazghulami speakers living in Dushanbe and Moscow, as well as those with a higher degree of education, have attained a higher degree of proficiency in the language. It is reported that the Yazghulami speakers have positive attitudes toward their own language overall, regarding it as important for family life and communication as well as practicing religion and gaining respect (Tiessen et al. 2010:10).

Figure 1: Map of Tajikistan and bordering countries with the Pamir area circled. Credit to University of Texas Library for the provision of this map, here slightly modified.

Orthographies based on both Cyrillic and Latin script mixed with IPA symbols have been presented for Yazghulami (see Édel’man & Dodykhudoeva 2009:778) but are not used by the Yazghulami speakers. Members of the organization TICRO, carrying out linguistic work in Tajikistan, would now like to compile a more user-friendly orthography that is compatible with modern technology. In dialogue with members of TICRO, I therefore undertook the task of describing the phonology of Yazghulami in order to facilitate the development of such orthography, hence the purpose of this study, presented above.

1.2 Previous research

The first linguistic note found on Yazghulami was made by French scholar M. R. Gauthiot in 1916, who then presented a list of about 150 Yazghulami words (Gauthiot 1916). During the 1960s, the Russian researcher D. I. Édel’man carried out field research among Yazghulami speakers and has published a number of descriptions of the language (Édel’man 1966; 2000), including a Yazghulami-Russian dictionary (1971), and is considered the one who has contributed the most to what is now known about the language. The scholar J. Payne (1987, 1989) has furthermore described the Iranian
languages and the Pamir languages in general, their characteristics and relations, and has by that given a brief account of given traits in Yazghulami.

Payne (1989), Èdel’man (2000), and Èdel’man and Dodykhudoeva (2009) have in part described the phonological characteristics of the Yazghulami language, and stated that the language has a phoneme inventory of as many as 37 consonants, among which a series of six labialized velar and uvular consonants are found together with six non-labialized counterparts. According to Èdel’man and Dodykhudoeva (2009:779), Yazghulami also displays two palatal plosives, and altogether make use of as many as 8 palatal, velar, and uvular plosives. They further mention that Yazghulami displays a set of four alveolar and postalveolar fricatives, as well as four affricative counterparts. The occurrence of [h] does not function as a phoneme, but might be heard before vowel-initial words or syllables (Èdel’man & Dodykhudoeva, 2009:777).

Payne (1989) and Èdel’man and Dodykhudoeva (2009) also claim that the language has 8 vowels. There is said to be a length contrast in the pair of /a/ and /aː/, but not between any other vowels. The length contrast from Old Iranian is instead replaced by the unstable central vowel /ə/ which has a wide range of allophones in comparison to the other vowel phonemes of the language, and which tends to be reduced in open, unstressed syllables. Furthermore, /u/ has the labialized counterpart /uʷ/, and the remaining vowels are /i/, /e/ and /ɔ/ (Èdel’man & Dodykhudoeva 2009:777–8; Payne 1989:426–7).

According to Payne (1989:427), the syllables of Yazghulami can be both vowel- and consonant-initial. Two consonants can occur as a cluster in onsets, and when the unstable vowel /a/ is dropped, the onset can display three consonants. The coda, on the other hand, can consist of up to three consonants without any dropping of vowels. There is, however, no further description of the phonotactic constraints of the language, e.g. of how consonants can be combined. Payne (1989:427) also claims that word stress, with only a few exceptions, occurs on the final syllable of a word, even when the ending consists of an inflection, as common among the Pamir languages.

The Pamir area is home to a large number of mainly Iranian languages, and the South-East Iranian languages spoken in the west and south part of the Pamir mountains are referred to as the Pamir languages, to which Yazghulami also belongs (Èdel’man & Dodykhudoeva, 2009:773). In the 1890s, the German scholar W. Geiger presented an overview of the Pamir languages and their relations, but without mentioning the language of Yazghulami (Geiger 1974). The first to compare Yazghulami with other Pamir languages was Gauthiot (1916), mentioned above, and Yazghulami is thereafter included when the Pamir languages are mentioned.

The South-East Iranian language family consists of the following languages: The Shughni-Rushani group (i.e. Shughni, Rushani, Bartangi, Roshori and Khufi (Tiessen et al. 2010:7)), Sarikoli, Ishkashimi, Sanglechi, Zebaki, Wakh, Munji, Yidgha, Roshori (sometimes called Oroshori) and Pashto. Of these, all except Pashto are mainly spoken in the Pamir, and are generally labelled the Pamir languages (Payne 1987:514; 1989:417–420). Yazghulami, the Shughni-Rushani group and the now extinct language Wanji, form the so called North Pamir group, a sub-group of the Pamir languages. The languages of this sub-group seem to be genealogically related in such a way that it is possible that there once was an inner-Pamirian language from which they developed. This possible proto-language has in part been reconstructed by Sokolova (1967) and Èdel’man (1980), but to

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1 Èdel’man and Dodykhudoeva (2009) do not differentiate between dental and alveolar, or postalveolar and palatal in their text, and instead use the terms dental and palatal to describe the fricatives and affricates.
2 That is, the Badakhshan Provinces of both Tajikistan and Afghanistan, the south part of Xinjiang Province in China and parts of northern Pakistan (Èdel’man & Dodykhudoeva, 2009:773).
connect all of the Pamir languages to one common Pamirian proto-language is not possible as they derive from different East Iranian origins (Èdel’man & Dodykhudoeva 2009:776). For an overview of the position of Yazghulami within the Indo-European language family, see Figure 2 below.

The Pamir area is said to be a sprachbund where the languages display a number of common features, not necessarily due to genetic relationships, but to their close geographic connection. Some of these common features are a) alternation of vowels to express morphological distinctions; b) three verb stems, one for present, one for past and one for perfect tense; c) person inflection on the verb in present tense but on the first main constituent of the clause in past and perfect tenses; and d) Subject-Object-Verb as the basic word order, prepositions mainly and dependents preceding the head noun in noun phrases (Payne 1989:422). In Édel’man’s description of Yazghulami (2000), all of these features are presented, except that of vowel alternation. Moreover, the contrast of duration in vowels found in Old Iranian is, with a few exceptions, lost. As for consonants, neither of the Pamir groups are said to have a phonemic /h/, although a phonetic [h] can occur in word or syllable initial position preceding a vowel, as in the case of Yazghulami as mentioned above (Èdel’man & Dodykhudoeva 2009:777).

Common for the North Pamir group, as well as for Wakhi, is to display a set of velar and uvular fricatives, sometimes both voiced and voiceless, as in Yazghulami (Èdel’man & Dodykhudoeva 2009:777). The proto-language of the North Pamir group is furthermore said to have had conditionally palatalized velar plosives, which now have become phonemic in the languages of the North Pamir group. Moreover, several of the Pamir languages display a set of retroflex consonants, however, this trait is not found among the North Pamir languages. Furthermore, stress is said to fall on the last syllable in nominal words in all of the Pamir languages; for verbs, the patterns of stress differ between the languages (Èdel’man & Dodykhudoeva 2009:779–780).

Not only do the Pamir languages share certain traits, but there are also features shared by languages in what can be referred to as the macro area of Central Asia, to which Yazghulami belongs. One of these features is the contrast between uvular and velar plosives, which are for instance not found in South Asia. Another feature is the dental or alveolar affricates, contrasting with palatal or alveopalatal affricates (Tikkanen 2008:253–4). As mentioned above, Èdel’man and Dodykhudoeva (2009:779) have suggested that these two features are present in Yazghulami.
1.3 Theoretical prerequisites

It should be noted that the analysis of this study is not carried out within a given theoretical framework, but the method of using minimal pairs to strengthen or dismiss contrasts between segments originates from Trubetzkoy (1969) and his structuralistic approach to phonology. He presented principles on how to determine the phonemic status of segments by comparing sounds in the exact same environment, noting if a) the segments cause a change in lexical meaning, i.e. being different phonemes; or if b) the segments are phonetic variants which do not cause any change in the lexical meaning, i.e. standing in free variation. If segments that are related in regard to acoustically or articulatory features are not found in the exact same environment, the segments are considered to be variants of the same phoneme, standing in complementary distribution \(^3\) (Trubetzkoy 1969:46–49).

The term *phoneme* is used throughout this thesis, although it is no longer a central concept in phonological theory (Dresher 2011:241). Different views of the phoneme have been presented during the 20\(^{th}\) century, describing it as a physical, psychological or merely a theoretical concept (for an overview of this, see Dresher 2011). Due to the lack of invariance, the view of the phoneme as a physical reality has more or less been discarded, while it is still regarded as a psychological and theoretical concept, although with several restrictions (Dresher 2011:244–245). Walsh (2009) has suggested that speakers in general have a phonemic awareness, i.e. a knowledge that words are constituted of sounds, but not necessarily have a phonemic skill, i.e. that speakers can experiment with these sounds. When the term is used in this thesis, it refers to a segment contrasting to another segment, which character distinguishes one word from another in minimal pairs. How Yazghulami speakers themselves think of a given segment has not played a significant role in the analysis; however, consultants have been able to discuss specific segments during the study.

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\(^3\) *The terms free variation and complementary distribution were not used by Trubetzkoy himself, but are found in later functional approaches to phonological analysis, such as Burquest and Payne (1993).*
2 Method

2.1 The setting
During my visit, which lasted for 12 weeks in the spring of 2015, I stayed in a Yazghulami family in the Asfaltyni area of Dushanbe, where a large part of the neighbours were Yazghulami speakers. I was very well received by the family, their relatives and neighbours, who included me in their everyday life. When I first came, we had no language in common, as I neither speak Tajik nor Russian, but the family regarded it as their task to teach me their language, and our level of communication grew throughout my stay, both through my understanding of Yazghulami, and their increased understanding of English.

In Dushanbe, there was a TICRO office working with a few languages spoken in Tajikistan, including Yazghulami. Before my arrival, Ranodegim Gavasova, a Yazghulami speaker, and Sitora Sardorova, a Tajik university lecturer of English, both from Dushanbe, had started discussing the phonology of Yazghulami, and the idea of an orthography had come about. Gavasova became my main consultant during my stay, and an important link to the Yazghulami community, while Sardorova helped me communicate with the speakers as she spoke both Tajik and English.

During one week at the end of my stay, I traveled together with Gavasova to the Yazghulom valley in Gorno-Badakhshan Autonomous Province in the Pamir Mountains. However, due to data of poor quality, the recordings from the Yazghulom valley are not used in this present study.

2.2 Data collection

2.2.1 Consultants
Mainly women were consulted for the data collection of this study, as there are some limitations to how men and women interact in this culture; there are generally no formations of groups of both men and women on social occasions. One exception is, however, the rhyme session, mentioned in 2.2.2 below, where one man was invited by one of the other consultants and contributed to the list of rhymes. The data from all consultants except that of Gavasova have been handled anonymously.

2.2.2 Material
Two types of material were recorded with the speakers: a) monologues, and b) word lists. The recordings of the monologues will be described first, followed by a description of the recordings of the word lists.

The settings for the recordings were two different Yazghulami homes in the Asfaltyni area of Dushanbe, and groups of 4 to 7 women invited by Gavasova were asked to tell a story of 5 to 10 minutes each. One woman spoke at a time, but the women listening were encouraged to ask questions to help the speaker forward in her story. Initially, they were suggested topics such as the ones listed below, which was helpful when someone did not know what to tell, and created a mix of anecdotes and stories on family relations:
During the sessions, tea and snacks were served, and the women were free to come and go as they liked, some stayed during the whole session, while some stayed only for a shorter time. Four sessions for recording monologues took place, resulting in 26 recorded monologues. Due to time limitation, all of the 26 recordings could not be used for this study, but 8 of them were transcribed, translated and glossed, giving a material of approximately 25 minutes. The 8 monologues were chosen partly based on the order they were recorded in – early recorded, early transcribed – and partly to get a good spread of the age and background of the consultants. In Appendix B, an extraction of one of these texts is presented.

As for the word lists, three different kinds of lists were recorded during the study: a) a Swadesh list; b) lists of rhymes; and c) lists of words beginning with or containing certain sounds. These are described in detail below. Gavasova was recorded for all word lists.

At the very beginning of the study, a Swadesh list of 207 words (see Appendix A) was recorded and transcribed to get a first understanding of the speech sounds of the language. The Swadesh list was presented in Tajik both in speech and in text to the consultant, who in turn said the equivalent words in Yazghulami and repeated them twice.

In order to elicit some minimal pairs in addition to those found in the monologues, a group of four Yazghulami speakers were asked to think of rhymes in their language. The informants together discussed and wrote down a list with the rhymes they could think of. Gavasova, who also was consulted for the other lists, kept a copy of the list in order to add a few words to it if she thought of any additional words, and was then recorded reading it two days later. The words were uttered in isolation, repeated twice and then translated into English via Tajik with the help of Sardorova, the lecturer of English.

Gavasova was moreover asked to make lists of words starting with or containing some of the different sounds that were suspected to be phonemes. This was done in order to get a clearer picture of different speech sounds that were similar to each other concerning place or manner of articulation. The sounds recorded were [θ], [ð], [c], [kʷ], [j], [gʷ], [q], [qʷ], [x], [xʷ], [χ], [γ], [w], and [d z]. As with the list of rhymes, these lists were made up and written down a few days before they were recorded, in order to give the informant time to think of words of interest. The lists were, however, not produced in group. In order to avoid list intonation in the recordings, the words were put into the sentence zamiμaj zveμ qataide X, ‘In Yazghulami language, you say X’, and moreover repeated twice and translated into English in the same way as in the list of rhymes mentioned above.

In total, the Swadesh list, the list of rhymes, and the lists of words starting with or containing specific segments, generated 404 words, most of them repeated twice. Some overlap is found between the lists as a given word occurs in several lists.
2.2.3 Data processing and software

All of the material was recorded with the Roland brand audio recorder Edirol R-09 in 24 bit wav-format.

The process of transcribing, translating and interlinearizing the material will be described below. The process differs slightly in the monologues and the word lists; the process for the monologues will be described first followed by a description of the process for the word lists.

As a first step in the transcription of the monologues, Gavasova made transcriptions into the Tajik Cyrillic alphabet with certain combinations of letters for sounds not represented in the Cyrillic alphabet. To transcribe the monologues, she used Audacity, a program for transcribing audio data, in which she had some training. The transcriptions were then transferred into IPA symbols by means of a find-and-replace tool. This allowed for a first sketch of the monologues, and the transcriber presented word boundaries which would have been time-consuming for me to extract. In order to make the transcriptions more phonetically accurate, I went through the monologues to make sure that the transcriptions corresponded to the speech sounds, and made changes where needed. The programs WaveSurfer and Speech Analyzer were used to view spectrograms and pitch contours, which helped to secure the accuracy of the transcriptions.

As a second step, the monologues were translated into English via Tajik. Gavasova was the consultant during these translating sessions, and Sardorova was present, making the translation into English possible. The monologues were played in short sections, after which the speaker was asked to give a word-by-word translation as well as a sentence-by-sentence translation. The transcribed text was also presented to the speaker in order to assist when the whole section could not be remembered. When two or more words with different forms were said to have the same or similar meaning, we compared the words and in that way elicited inflections, compound words etc. When a loanword occurred, this was noted as well. The translation was both recorded and written down during the sessions.

As a third step, the monologues were added and interlinearized in FLEx (FieldWorks Language Explorer), which allows for word-by-word translation, interlinearization and the writing of grammatical rules. No standardization was made for words that showed different forms, e.g. zawd and zawd ‘heart’, but all forms were added into FLEx, in order to make a thorough phonological analysis possible, where all different forms are of interest.

As for the word lists, they were transcribed in IPA using Elan, another program for transcribing data, and then transferred to FLEx. WaveSurfer and Speech Analyzer were used when needed, to view spectrograms and pitch contours, just as with the monologues. As the lists were translated at the same time as they were recorded, no further sessions were used in order to make an initial interlinearization of the words, which most of the time were in their basic form.

2.3 Data analysis

The analysis of the data was made manually, by listing phones that are similar to each other by means of manner or place of articulation, and thereafter looking for minimal or near minimal pairs in the data within these parameters, in order to verify or rule out a phonemic contrast. The parameters are as followed:
For vowels, the contrast between different heights of the tongue, the front and back position of the tongue, as well as length and roundness were examined.

For plosives, the contrast of voice in all places of articulation was examined, as well as the contrast of position of bilabial, dental, palatal, velar and uvular plosives; and, finally, labialized and non-labialized plosives were compared.

For fricatives, the contrast of voice was examined, as well as the contrast of position of alveolars and postalveolars, and furthermore in velar and uvular position (no palatal plosives were found in the data). Finally the contrast of labialized and non-labialized fricatives was examined.

For affricates, the contrast in voice and place of articulation was examined, as well as the contrast to their plosive and fricative counterparts.

For nasals, the contrast between bilabial, dental, palatal and velar phones was examined.

For approximants, the contrast to other consonants in the same or similar place of articulation was examined where relevant, as well as their contrast to their vowel counterparts.

For the lateral approximant and the trill, the contrast to consonants of similar place or manner of articulation was examined.

Furthermore, to describe the phonotactic constraints of Yazghulami, the occurrences of different syllables were listed, and the consonant clusters were studied. Labialized consonants as well as affricates were moreover compared with consonant clusters to distinguish if they consisted of one or more phones.

Stress patterns on word level were examined for verbs and nouns, both in basic and inflected forms of the words. The ambition was to cover inflections by all affixes found in the data, as different kinds of affixes resulted in different stress patterns for the word inflected. It is however possible that some affixes have been missed due to inaccurate annotation. Lists of affixes for the different parts of speech were made, and for each affix, two to five words where studied. The number of words studied depended on the clarity of the position of stress.
3 Results

Yazghulami plausibly has as many as 44 phonemes, of which 8 are vowels and 36 are consonants.

The vowel system is found to consist of two front vowels, four central vowels of which two contrast in duration, and finally two back vowels, as presented in Table 1 below. The vowels are described further in section 3.1 below.

Table 1: The vowel phoneme inventory of Yazghulami.

<table>
<thead>
<tr>
<th>Front</th>
<th>Central</th>
<th>Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>/i/</td>
<td>/u/</td>
<td>/u/</td>
</tr>
<tr>
<td>/e/</td>
<td>/a/</td>
<td>/o/</td>
</tr>
<tr>
<td>/a/</td>
<td>/aː/</td>
<td></td>
</tr>
</tbody>
</table>

The consonant system consists of six manners of articulation, namely plosives, fricatives, affricates, nasals, approximants, a lateral approximant and a trill, distributed on eight positions, namely bilabial, labiodental, dental, alveolar, postalveolar, palatal, velar and uvular. Among the velar and uvular plosives and fricatives there seems to be a set of labialized phonemes, although these have not been fully affirmed within this study. The status of the alveolar affricate /d̪z/ is moreover somewhat uncertain, hence the parentheses in Table 2 below, where the consonants are presented. The consonants are described further in section 3.2 below.

Table 2: The consonant phoneme inventory of Yazghulami, uncertain phonemes within parentheses

<table>
<thead>
<tr>
<th>Bilabial</th>
<th>Labiodental</th>
<th>Dental</th>
<th>Alveolar</th>
<th>postalveolar</th>
<th>Palatal</th>
<th>Velar</th>
<th>Uvular</th>
</tr>
</thead>
<tbody>
<tr>
<td>p</td>
<td>b</td>
<td>t</td>
<td>d</td>
<td>c</td>
<td>k</td>
<td>q</td>
<td>q</td>
</tr>
<tr>
<td>Fricative</td>
<td>f</td>
<td>v</td>
<td>θ</td>
<td>δ</td>
<td>s</td>
<td>z</td>
<td>/x̌ y/</td>
</tr>
<tr>
<td>Affricate</td>
<td>t̪ s (dz)</td>
<td>t̪ f</td>
<td>d̪ z</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nasal</td>
<td>m</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approximant</td>
<td>w</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>j</td>
</tr>
<tr>
<td>Lat. approximant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>l</td>
</tr>
<tr>
<td>Trill</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>r</td>
</tr>
</tbody>
</table>

Where free variation of the realization of phonemes is mentioned, this is found both to be due to variation between speakers, as well as to variation of one and the same speaker.

As for suprasegmentals, the syllable structure is found to allow for clusters of no more than two consonants in the onset and two in the coda, as presented in 3.4.1. The stress is found to generally fall on the last syllable of a word, although some exceptions are found, as presented in 3.4.2.
3.1 Vowels

Eight vowels are found to be phonemic in Yazghulami, namely /ɪ/, /ʉ/, /u/, /ɛ/, /ə/, /ɔ/, /a/ and /aː/, as presented in Table 1 above. The values of the first and second formants (F1 and F2) are presented in Figure 3 below. The vowels /a/ and /aː/ differ in length, a contrast that is not found in the other vowel phonemes. A presentation of contrasts, distribution, and variation of the vowels is given below.

![Formant plot of vowels in Yazghulami.](image)

3.1.1 Contrast

Duration

A contrast of length is found between /a/ and /aː/, where the longer /aː/ tends to be articulated somewhat farther back than its shorter counterpart. The difference in quality does not seem to be the main contrastive factor, as the quality of the two vowels is overlapping at times, the reason why length is analyzed as the primarily contrasting feature here. Measured in monosyllabic words with CVC structure recorded in list format, the shorter /a/ has a mean length of 86 ms, while the longer /aː/ has a mean length of 158 ms. A minimal pair that illustrates the difference between these vowels is shown in (1).

(1) Contrast of length

/a/ vs. /aː/  
/xʷan/ ‘blood’  /xʷaːn/ ‘cow’

Although there is some variation of length between the other vowels, /ɪ/, /ʉ/, /u/, /ɛ/, /ə/ and /ɔ/, no other vowel pair has been found where length seems to be the primary contrastive factor. There is a clear difference in length between the vowels of /u/ and /ʉ/, where /u/ has a mean length of 82 ms, while /ʉ/ has a mean length of 182 ms, measured in monosyllabic words with CVC structure. The place of articulation is, however, distinct, where /u/ is more central than /ʉ/, as presented in Figure 3 above. The duration is therefore not regarded as the contrastive factor but rather as a characteristic of the vowels. The vowel /ə/ has the shortest duration of the vowels with a mean length of 55 ms in
monosyllabic words of CVC structure, but is not found to contrast in length to any of the other vowels. Duration has therefore not been given any phonologic status for the vowels except for /a/ and /aː/ in this analysis.

**Place of articulation**

Contrast has been affirmed between some vowel phonemes where minimal pairs are found, as presented in (2) below. Some essential contrasts have, however, not been affirmed, such as that between /u/ and /ʉ/, where no minimal pairs are found, and the contrast can therefore not be fully established. The vowels do occur in analogous environment, also shown below, which indicates that they do not stand in complementary distribution. It is in other words plausible that they are contrastive, although it cannot be proven within this study. The contrast between /e/ and /ə/ is moreover not fully established, as no minimal pair is found; however, as they occur in analogous environment as well, they are regarded as phonemes in this study.

\[(2) \text{Contrast in place of articulation}\]

| /u/ vs. /e/ | /γw/  | ‘hunt’ | /χw/  | ‘ox’ |
| /sm/  | ‘wire’ | /sm/  | ‘third’ |
| /i/ vs. /u/ | /ðis/  | ‘sharp’ | /ðus/  | ‘ten’ |
| /u/ vs. /a/ | /ðzuq/  | ‘poke’ | /ðuz/  | ‘torn’ |
| /ðust/  | ‘hand’ | /pust/  | ‘short’ |
| /u/ vs. /ə/ | /kum/  | ‘little’ | /kəm/  | ‘when’ |
| /gʊ/  | ‘listen’ (PST) | /gəxt/  | ‘meat’ |
| /u/ vs. /ʊ/ | /χ”uy/  | ‘sweet’ | /χ”ʊy/  | ‘hard’ |
| /e/ vs. /ə/ | /wʊ’gen/  | ‘some’ | /wʊ’ən/  | ‘black’ |
| /pəð/  | ‘foot’ | /pəv/  | ‘fat’ (ADJ) |
| /e/ vs. /ə/ | /ðed/  | ‘hit’ (PST) | /ðəd/  | ‘smoke’ |
| /e/ vs. /a/ | /səm/  | ‘third’ | /sam/  | ‘half’ |
| /e/ vs. /ə/ | /χ”er/  | ‘scratch’ | /χ”ə.r/  | ‘eat’ (INF) |
| /ə/ vs. /e/ | /kənda/  | ‘stop’ (V) | /kənda/  | ‘where’ |
| /ʃəd nər/  | ‘channel’ | /ʃəd/  | ‘hear’ (PST) |
| /ə/ vs. /a/ | /kəl/  | ‘all’ | /kal/  | ‘head’ |
| /ə/ vs. /ə/ | /dəyd/  | ‘daughter’ | /da:yd/  | ‘cut’ (PST 3SG?) |
| /ðəm/  | ‘tail’ | /ðə:n/  | ‘tooth’ |
| /ə/ vs. /ə/ | /ʃəd/  | ‘hear’ (PST) | /ʃat/  | ‘near’ |
| /ʃən/  | ‘how long’ | /ʃəm/  | ‘eye’ |

**3.1.2 Distribution**

The phoneme of /u/ is not found word initially in the data and only occurs in grammatical words and suffixes in final position. The usage of /u/ therefore seems to be limited to this extent. A similar distribution is plausible for /e/, which is only found word initially in one occurrence in the data, and
that time sentence medial. It is therefore plausible that /ɛ/ does not occur word initially, as more occurrences should then be expected. This can, however, not be stated with certainty in this analysis. The phoneme of /ɛ/ only occurs before /n/ word initially, and is not found in final position, and therefore seems to be limited to this extent. The distribution for each vowel is presented in (3) below.

(3) Distribution in the word

<table>
<thead>
<tr>
<th>Initial:</th>
<th>Medial:</th>
<th>Final:</th>
</tr>
</thead>
<tbody>
<tr>
<td>/u/</td>
<td>/ˈtaː/</td>
<td>‘come’ (PST)</td>
</tr>
<tr>
<td>/u/</td>
<td>—</td>
<td>/nug/</td>
</tr>
<tr>
<td>/u/</td>
<td>/ˈuda/</td>
<td>‘he’ (SBJ)</td>
</tr>
<tr>
<td>/o/</td>
<td>/on/</td>
<td>‘in’</td>
</tr>
<tr>
<td>/o/</td>
<td>/ˈɔzɛr/</td>
<td>‘now’</td>
</tr>
<tr>
<td>/a/</td>
<td>/aˈɡaː/</td>
<td>‘if’</td>
</tr>
<tr>
<td>/aː/</td>
<td>/aːs/</td>
<td>‘I’</td>
</tr>
<tr>
<td>/ɛ/</td>
<td>[ɛrˈkaf]</td>
<td>‘spoil’ (3SG)</td>
</tr>
</tbody>
</table>

In unstressed position, the longer vowel /aː/ is reduced to /a/, giving patterns such as [χʰaː]r ‘eat (IMP)’ and [χʰarəd] ‘eat (INF)’. The feature of length is therefore not found to be contrastive in unstressed position. Some variation in vowel quality is found in unstressed position regarding the other vowels, which is presented in 3.1.3 below, however, these vowels still occur in unstressed position, as shown in (4) below.

(4) Distribution in unstressed syllable

| /i/      | /dзиˈwak/ | ‘noisy’ |
| /u/      | /kuˈdak/ | ‘child’ |
| /u/      | /wuˈɡen/ | ‘some’ |
| /ɛ/      | /weˈχuːɡ/ | ‘man’ |
| /o/      | /ɣoˈɣɔn/ | ‘ear’ |
| /o/      | /dɔˈwuf/ | ‘snake’ |
| /a/      | /qaˈtɔl/ | ‘big’ |
| /aː/     | — |

3.1.3 Variation

The quality of the vowels varies to some degree. Word final and between voiceless consonants, vowels can be devoiced. Some free variation is furthermore found for the vowels, as presented in (5) below.
(5) Free variation of vowels

/ʉ/ [u] and [ʉ] /jʉk/ ‘this’ /juk/ or [jɔk]
/ʉ/ [u] and [ʊ] /nayu/ ‘don’t like’ /ˈnɔjʊ/ or /ˈnɔjʊə/
/e/ [ɛ] and [e] /ded/ ‘father’ /ded/ or [ded]
/ə/ [ə] and [ʌ] /ʃɔd/ ‘went’ /ʃɔd/ or [ʃɒd]
/a/ [a] and [æ] /wanda/ ‘here’ /wanˈda/ or [wanˈde]
/aː/ [aː] and [ɐː] /naːn/ ‘mother’ /naːn/ or [nɐːn]

In unstressed position /a/ and /ɔ/ tends to be realized as [ə], as in the examples in (6) below, where the vowel of one and the same root is realized differently depending on whether the syllable is stressed or not.

(6) Neutralization to /ə/ in unstressed position

/gʷɔl/ [gʷɔl] ‘flower’ but /gʷəlˈɔr/ [gʷəlˈɔr] ‘wild rose’
/mad/ [mad] ‘became’ but /məd/ [məˈdə] ‘became-CONN’

The variation of /ɔ/ is not a matter of quality; instead the vowel tends to be omitted, either word initially before nasals, making the nasal the syllabic segment, or in between consonants, regardless of manner of articulation or voice. The vowel drop is moreover found both in stressed and unstressed syllables. This variation is presented in (7) below.

(7) Variation of /a/

/əndə/ ‘there’ /ənˈda/ or [nˈda]
/χɔkɔstɔr/ ‘ash’ /χɔkɔsˈtɔr/ or [χksˈtɔr]
/ζɔn/ ‘knee’ /ζɔn/ or [zn]
/ɪsəɡəm/ ‘small’ (1PL) /ɪsəˈɡəm/ or [ɪsˈɡəm]

3.2 Consonants

36 consonants are found to be phonemic in Yazghulami, being plosives, fricatives, affricates, nasals, approximants, one lateral approximant and one trill. Three plosives and three fricatives are furthermore found to be labialized. A presentation of contrasts, distribution, and variation of the consonants is given below, divided into the categories mentioned.

3.2.1 Plosives

Contrast

Eleven plosives are found to be phonemic in Yazghulami, giving /p/, /b/, /t/, /d/, /k/, /kʷ/, /g/, /gʷ/, /q/ and /qʷ/. These are distributed on five places of articulation: bilabial, alveolar, palatal, velar and uvular. For the bilabial, alveolar and velar plosives, there is a contrast in voicing, and for the velar and uvular plosives, there is a contrast of labialization. The phone [j] occurs in the data, and is regarded as an allophone of /c/ rather than as a phoneme of its own. Aspiration occurs but is not found to be
contrastive, which is described further in *Variation* below. We will start by looking at the contrast of voice, thereafter turn to the contrast of place of articulation, and finally turn to the contrast of labialization.

The voiced and voiceless bilabial plosives /p/ and /b/ are contrasting, as well as the velar plosives /k/ and /g/. For the alveolar plosives /t/ and /d/, no minimal pairs are found in the data to assure their contrast, although the two phones occur in analogous environment, which indicates that they function as phonemes in the language. Examples of these contrasts are presented in (8) below. The two palatal plosive [c] and [j] are furthermore present in the data; however, their voicing does not seem to be contrastive but rather depend on position in the word, which is explained further in *Distribution* below.

(8) Contrast of voice

| /p/ vs. /b/   | /paj/   | ‘scar’   | /baj/   | ‘go away’        |
| /peθ/       | ‘foot’  | /beθ/    |         | ‘drop’ (3PL OBJ) |
| /t/ vs. /d/ | /tɛda/  | ‘mulberry’ | /dɛd/  | ‘father’         |
| /dɛst/     | ‘breast’ | /sɔd/    |         | ‘push’ (PST)     |
| /k/ vs. /q/ | /kəɭ/  | ‘all’    | /ɡəɭ/  | ‘mute’           |
| /ɭuːɭ/  | ‘lisp’  | /ɣuːɡ/   |         | ‘eat’ (PST)      |

As for the contrasts in the places of articulation, there is a series of palatal, velar and uvular plosives. As both [c] and [j] occur in the data, these are compared with their velar counterparts, to rule out allophony with these phonemes. The plosive [c] is found to contrast with [k], and [j] is found in analogous environment as [g], which indicates that they contrast, although no minimal pair is found to confirm this. Moreover, the velar plosive [k] is found to contrast with the uvular plosive [q]. This is all exemplified in (9) below.

(9) Contrast of place of articulation

| /c/ vs. /k/  | /caːɭ/  | ‘work’   | /kaːɭ/  | ‘deaf’         |
| /caʃ/      | ‘look’   | /kaf/    |         | ‘warm’         |
| /k/ vs. /q/ | /kəɭ/   | ‘all’    | /ɡəɭ/   | ‘lake’         |
| /dək/      | ‘that’   | /dzəq/   |         | ‘poke’         |
| /ɡ/ vs. [j] | /aɡa/   | ‘awake’  | [maɡas] | ‘fly’ (N.)     |
| /ɡʷʊɾaɡ/ | ‘cane’   | [wadaŋ]  |         | ‘lamb’         |

As for the three labialized plosives, /kʷ/, /ɡʷ/ and /qʷ/, the consonants consist of only one segment which has a rounding of the lips from the start. A plausible assumption would be that they consist of two segments – a cluster of the plosive and [w] – but spectrograms show only one segment, which seems to be rounded from the start, as no significant change occurs during its articulation, as shown in Figure 4. The syllable structure of Yazghulami, presented in 3.4.1, is moreover found not to allow for any clusters of plosives and approximants, which further motivates the analysis of the labialized plosives as consisting of one segment. The labialized plosives are furthermore equal in length to their non-labialized counterparts.
The distinct sounds of the labialized plosives do not seem to be triggered by their surroundings, as all vowel phonemes are found to follow some or all of the labialized plosives, and these vowels are also found to follow the non-labialized consonants. The exception is /qʷ/, which is only found to be followed by /ə/; this might be due to a restriction of the phoneme, or to the fact that few occurrences of the phoneme are found in the data set, as the phoneme is not very frequent in the language. No minimal pairs are found for any of the contrasts between labialized and non-labialized plosives, and the labialized sounds only occur in initial position, except for /kʷ/, which is also found word medially. This makes the status of them as phonemes somewhat questionable, but as nothing is found to trigger the labialization of these plosives, they are regarded as phonemes in this analysis. The plausible contrast is presented in (10) below.

(10) Contrast by labialization

<table>
<thead>
<tr>
<th>/kʷ/ vs. /k/</th>
<th>/kʷɔnda/</th>
<th>‘where’</th>
<th>/kɔlada/</th>
<th>‘animal’</th>
</tr>
</thead>
<tbody>
<tr>
<td>/kʷɔnda/</td>
<td>‘suck’</td>
<td>/ʒəkad ʒ/</td>
<td>‘squeeze’</td>
<td></td>
</tr>
<tr>
<td>/kʷɔnda/</td>
<td>‘stop’ (v.)</td>
<td>/kɔnc/</td>
<td>‘dig’</td>
<td></td>
</tr>
<tr>
<td>/qʷ/ vs. /ɡ/</td>
<td>/qʷɔlɛr/</td>
<td>‘wild rose’</td>
<td>/ɡal/</td>
<td>‘mute’</td>
</tr>
<tr>
<td>/qʷɔlɛr/</td>
<td>‘cane’</td>
<td>/ɡuʃə/</td>
<td>‘if’</td>
<td></td>
</tr>
<tr>
<td>/qʷ/ vs. /q/</td>
<td>/qʷɪqadʒ/</td>
<td>‘envy’ (v.)</td>
<td>/qɪn/</td>
<td>‘hard’</td>
</tr>
<tr>
<td>/qʷɪqadʒ/</td>
<td>‘nosy’</td>
<td>/qəq/</td>
<td>‘dry’</td>
<td></td>
</tr>
</tbody>
</table>

Distribution

The plosive phonemes /p/, /b/, /t/, /d/, /k/, /g/, and /q/ and are found in initial, medial and final position of a word, as presented in (11) below. The palatals [c] and [ʃ] are found to stand in complementary distribution, where [c] only occurs word or stem initially and after nasals, while [ʃ] only occurs between vowels and word finally. Either of the two could be chosen as the phoneme representative; /c/ has been chosen here as it occurs word initially. Note that /c/ does occur word medial and final in (11) below, but only as it is stem initial in /nacɛg/ na-cɛg ‘NEG-do’, and follows a nasal in /yaŋɔ/. The labialized plosives are also limited in their distribution as they only occur word initially, and for /kʷ/ also word medially, which is also presented in (11) below.
(11) Distribution of plosives

<table>
<thead>
<tr>
<th>Initial</th>
<th>Medial</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>/p/</td>
<td>/pɪsɪt/</td>
<td>‘ask’ (2PL)</td>
</tr>
<tr>
<td></td>
<td>/gapaθ/</td>
<td>‘word’ (PL)</td>
</tr>
<tr>
<td>/b/</td>
<td>/bɪjɛr/</td>
<td>‘yesterday’</td>
</tr>
<tr>
<td></td>
<td>/mabuːr/</td>
<td>‘thing’</td>
</tr>
<tr>
<td>/t/</td>
<td>/tʂɔdʒ/</td>
<td>‘burn’ (INF)</td>
</tr>
<tr>
<td></td>
<td>/pataʃ/</td>
<td>‘cousin’</td>
</tr>
<tr>
<td>/d/</td>
<td>/dɛvuz/</td>
<td>‘thick’</td>
</tr>
<tr>
<td></td>
<td>/mada/</td>
<td>‘became’</td>
</tr>
<tr>
<td>/c/</td>
<td>/caːr/</td>
<td>‘work’</td>
</tr>
<tr>
<td></td>
<td>/nacɛ/</td>
<td>‘don’t do’</td>
</tr>
<tr>
<td>/k/</td>
<td>/kɪrəm/</td>
<td>‘worm’</td>
</tr>
<tr>
<td></td>
<td>/ɪkud/</td>
<td>‘home’</td>
</tr>
<tr>
<td>/kʷ/</td>
<td>/kʷɔnda/</td>
<td>‘where’</td>
</tr>
<tr>
<td></td>
<td>/rakʷadʒ/</td>
<td>‘suck’ (INF)</td>
</tr>
<tr>
<td>/g/</td>
<td>/gɔxt/</td>
<td>‘meat’</td>
</tr>
<tr>
<td></td>
<td>/mɑɡa/</td>
<td>‘died’</td>
</tr>
<tr>
<td>/ɡʷ/</td>
<td>/ɡʷɔrag/</td>
<td>‘cane’</td>
</tr>
<tr>
<td>/q/</td>
<td>/qatɔl/</td>
<td>‘big’</td>
</tr>
<tr>
<td></td>
<td>/maqəl/</td>
<td>‘like’</td>
</tr>
<tr>
<td>/qʷ/</td>
<td>/qʷɔnts/</td>
<td>‘nosy’</td>
</tr>
</tbody>
</table>

When a plosive occurs in cluster with another consonant, they are both either voiced or voiceless, except in combination with nasals. For instance, /d/ always follows another voiced consonant, while /t/ follows both other voiceless consonants and nasals. No examples are, however, found to argue that this is due to co-articulation; instead I regard it as a feature of the syllable structure, which is presented further in 3.4.1.

Variation

Some variation is found for plosives; in word final position, the release of the plosive can be non-audible, giving the variation presented in (12) below.

(12) Non-audible releases

/ʃaːt/ ‘came’ | [ʃaːt] or [ʃaːt̚]
/deːd/ ‘father’ | [deːd] or [deːd̚]

When /ɡ/ occurs word finally after /n/, it can be omitted, although the nasal is still assimilated to the velar’s place of articulation. The same tendency is moreover found for other final plosives without any nasal preceding it, although such variation is not as frequent as that of omitting /ɡ/ after /n/. The variation is presented in (13) below.

(13) Omitted plosives in final position

/ʃaŋ/ ‘leg’ | [ʃaŋ] or [ʃaŋ]
/nɛst/ ‘not have’ | [nɛst] or [nɛst]
Aspiration occurs for all voiceless plosives except the labialized, but is not found to be phonemic. Instead, aspirated plosives are found to be in complementary distribution with unaspirated ones; the aspiration generally occurs word initially, at the beginning of a stressed syllable, or utterance finally, while the plosives generally are unaspirated in other positions. This is presented with examples in (14) below.

(14) Complementary distribution of aspiration of plosives

Aspiration word initially: /kʰaʃ/ ‘warm’ [kʰaʃ]
Aspiration in stressed syllable: /χətʰen/ ‘wife’ [χəˈtʰen]
Aspiration utterance finally: /dʒətʰ/ ‘hair’ [dʒətʰ]
Unaspirated elsewhere: /xətɪ/ ‘near’ (POSS.) [ˈxətɪ]

The glottal plosive [ʔ] is found over word boundaries in between vowels or after an approximant followed by vowel, and as a variant of [h] in Tajik loanwords (see Variation in 3.2.2 below). The phone is not found to be phonemic, as it is limited to these environments. Examples are presented in (15) below.

(15) Occurrence of glottal plosive

In between vowels: /vəda a:s/ ‘…more, I…’ [vəda ?a:s]
Between /w/ and /a/: /znaw a:səm/ ‘…daughter-in-law, I…’ [znaw ?əzəm]
In Tajik loan: /ˈʔar/ ‘every’ (TJ) [ˈʔar]

3.2.2 Fricatives

Contrast

Fifteen fricatives are found to be phonemic in Yazghulami, giving /f/, /v, /θ/, /ð/, /s/, /z/, /ʃ/, /ʒ/, /x/, /xʷ/, /θ/, /ð/, /s/, /z/ and /x/. These are distributed on six places of articulation: labiodental, dental, alveolar, postalveolar, velar and uvular. All places display a contrast of voice, and the velar and uvular fricatives, with the exception of /θ/, have a contrast of labialization. We will start by looking at the contrast of voice, thereafter turn to the contrast of place of articulation, and finally look at the contrast of labialization.

The voiced and voiceless dental fricatives /θ/ and /ð/ are found to be contrasting, as well as the alveolar fricatives /s/ and /z/ and, moreover, the velar fricatives /x/ and /ɣ/. For the labiodental fricatives /f/ and /v/, as well as the post-alveolar fricatives /ʃ/ and /ʒ/ and finally the uvular fricatives /x/ and /ɣ/ and their labialized counterparts /xʷ/ and /ɣʷ/, a contrast has not been assured as no minimal pairs are found in the data, however, the pairs do occur in analogous environments, as presented in (16) below, which indicates that the phones are phonemic.

(16) Contrast of voice

/ʃ/ vs. /χ/ /ʃarən/ ‘child’ /χarən/ ‘bring back’
/ʃəfədʒ/ ‘say’ (INF) /ʃəndʒavədʒ/ ‘sew’ (INF)
/θ/ vs. /ð/ /θəd/ ‘liver’ /ðəd/ ‘hit’
/s/ vs. /z/ /swəd/ ‘year’ /zəwəd/ ‘heart’
Regarding the contrast of place of articulation, there is a contrast between the voiceless alveolar and post-alveolar /s/ and /ʃ/, as well as between the voiceless velar and uvular /x/ and /ɣ/, and furthermore between the voiced velar and uvular /u̯/ and /u̯/. These are therefore found to be phonemic in the language. For the voiced alveolar and post-alveolar fricatives /z/ and /ʒ/, as well as for the labialized voiceless velar and uvular /xʷ/ and /u̯/, no minimal pair is found to assert their status as phonemes, although the pairs do occur in analogous environments, which indicates that they are phonemic. The phonemes contrasting in place of articulation is presented in (17) below.

(17) Contrast of place of articulation

| /s/ vs. /ʃ/ | /ʃam/ ‘belly’ /ʃamnda/ ‘send’ |
| /z/ vs. /ʒ/ | /ʒamɪnda/ ‘belly’ /ʃam/ ‘half’ |
| /x/ vs. /ɣ/ | /ʃam/ ‘belly’ /ʃam/ ‘belly’ |
| /xʷ/ vs. /u̯/ | /ʃam/ ‘belly’ /ʃam/ ‘belly’ |

As for the three labialized fricatives, /xʷ/, /u̯/ and /u̯/, these are found to consist of only one segment which has a rounding of the lips from the start, as the case with the labialized plosives presented in 3.2.1 above. The fact that a labialized voiced velar fricative [ɣʷ] is not found is probably due to its overlap in pronunciation with /w/, which is also labial, velar and voiced. In Figure 5, a spectrogram of the labialized /ɣʷ/ is shown to demonstrate that only one segment is displayed.
The labialization of the labialized fricatives do not seem to be triggered by phonetic environment, but all vowel phonemes are found to follow some or all of the labialized fricatives, and these vowels are also found to follow the non-labialized counterparts. However, as for the labIALIZED plosives, no minimal pairs are found for any of the contrasts between labialized and non-labialized fricatives, and the labialized sounds only occur in initial position. Their status as phonemes are therefore somewhat questionable, but as nothing is found to trigger the labialization of these fricatives, they are regarded as phonemes in this analysis. The plausible contrasts between the labialized fricatives and their non-labialized counterparts are presented in (18) below.

(18) Contrast of labialization

```
/x/ vs. /xʷ/  /xant/  ‘hear’ (3SG)  /xʷan/  ‘blood’
/xɔd/  ‘hear’ (PST)  /xʷɔs/  ‘soft’
/χ/ vs. /χʷ/  /χuŋ/  ‘eat’ (PST)  /χʷuŋ/  ‘sweet’
/χaj/  ‘well’ (INTR)  /χʷajerg/  ‘mill’
/u/ vs. /uʷ/  /ua/  ‘still’  /uᵃf₃/  ‘return’
/ᵣam/  ‘sorrow’  /ᵣʷi³aᵣ/  ‘turn over’ (INF)
```

The fricative /uʷ/ has furthermore been compared with /w/, as their places of articulation are close to each other and the perception of /uʷ/ is similar to that of /w/. However, near minimal pairs have been found, which suggests that /uʷ/ is not a variation of /w/, as presented in (19) below.

(19) Contrast between labial/labialized velar and uvular consonant

```
/uʷ/ vs. /w/  /uʷaxt/  ‘finger’  /waχt/  ‘time’
/uʷi³aᵣ/  ‘turn over’ (INF)  /wi³aᵣ/  ‘through’ (INF)
```

Distribution

All of the non-labialized fricative phonemes, namely /ʃ/, /s/, /θ/, /θ̂/, /s/, /z/, /ʃ/, /ʒ/, /x/, /z/ and /s/ are found in initial, medial and final position of a word. The labialized fricatives /xʷ/, /χʷ/ and /uʷ/ are, however, limited in their distribution, as they only occur word initially. The distribution of the fricatives are presented in (20) below.
Distribution of fricatives

Initial:  Medial:  Final:
/f/  /fǝfatrat/  ‘flat bread’  /lafadʒ/  ‘say’ (INF)  /tɛf/  ‘spit’
/v/  /vǝts/  ‘aunt/uncle’  /mɛva/  ‘fruit’  /xǝtev/  ‘be in a hurry’
/θ/  /θǝbadʒ/  ‘lick’ (INF)  /mθǝdʒ/  ‘sit’ (INF)  /gapaθ/  ‘word’ (PL)
/δ/  /δǝγd/  ‘daughter’  /awuða/  ‘change’ (N.)  /smað/  ‘earth’
/s/  /sa:rjde/  ‘tomorrow’  /nasib/  ‘hope’ (V.)  /suvs/  ‘green’
/z/  /za:rd/  ‘yellow’  /pǝze/  ‘little’  /mawriz/  ‘raisin’
/j/  /jǝg/  ‘bone’  /refa/  ‘root’  /pǝfaj/  ‘cousin’
/ʒ/  /ʒǝraʒ/ (a kind of) ‘bird’  /tǝʒadʒ/  ‘walk’  /jǝdrǝj/  ‘hill’
/x/  /xǝk/  ‘fingernail’  /rǝxan/  ‘bright’  /yax/  ‘mouth’
/y/  /yǝw/  ‘ox’  /wuǝn/  ‘black’  /çuʃ/  ‘sweet’
/χ/  /χǝtǝn/  ‘wife’  /rɔçǝn/  ‘white’  /dǝry/  ‘late’
/ʂ/  /sǝwǝj/  ‘bee’  /dǝsǝult/  ‘snake’  /zǝnas/  ‘snow’
/xʷ/  /xʷǝn/  ‘blood’  —  —
/χʷ/  /χʷǝn/  ‘crow’  —  —
/ƣʷ/  /ƣʷǝfs/  ‘come back’  —  —

Variation

Between vowels, the voiceless alveolar fricative /s/ is generally voiced, giving the realization presented in (21). The contrast between /s/ and /z/ is, however, not fully neutralized in this position, as [s] can occur in between vowels. Such a clear pattern of voicing as this is, however, not found for the other voiceless fricatives, which generally remain voiceless in this position.

(21) Complementary distribution of /s/-allophones

/vaːs/  [vaːs]  ‘goat’  but  /vaːsat/  [vaːzat]  ‘goat’ (CONN)

The glottal fricative [h] occurs a few times in the data, but only in initial position preceding an [a], or in between vowels. The majority of these words are, however, Tajik; 13 out of 17 occurrences are found in words that for certain are loan from Tajik, while the origin of 4 words have not been possible to determine, but could be Tajik, taken in from another language, or could possibly be Yazghulami. The phone can be omitted in initial position, as in the Tajik loan /hama/ ‘all’ found as [hamaɪ] (POSS) and [ama] in the data. Variation has also been found where [ʔ] is pronounced instead of [h], which is presented in Variation in 3.2.1 above.
3.2.3 Affricates

Contrast

Four affricates are found to be phonemic in Yazghulami, namely /tʃ/, /tʃ/ and /dʒ/ and /dʒ/, being alveolar and postalveolar, and contrasting in voice. A comparison has been made regarding duration where the lengths of these phonemes have been compared with the corresponding /t/, /d/, /s/, /z/ and /ʃ/ as well as with clusters consisting of two consonants, in order to strengthen the assumption that these phones are one single segment and not clusters of two consonants. The duration of /tʃ/, /tʃ/ and /dʒ/ were affirmed to approximately 70–90 ms, which was slightly shorter than the duration of the corresponding phonemes that were measured to about 100–120 ms. The duration of the clusters that were measured were affirmed to 180–205 ms and were thus markedly longer than the affricates, which in turn were even slightly shorter than their corresponding phonemes. The fact that no consonant clusters of plosives followed by fricatives are found in the data (see 3.4.1) further motivates the analyses of these phones as affricates.

The phoneme /dʒ/ only occurs a few times in the data, and the duration of this phoneme differed from the others, as it measured approximately 150–240 ms, which is about the same length as consonant clusters, and markedly longer than the other affricates. However, /dʒ/ is regarded as a phoneme in this analysis for two reasons, namely that 1) consonant clusters of plosives followed by fricatives are not found in the data, as mentioned above; and 2) sets of phonemes tend to be symmetric; it is therefore expected to find a voiced alveolar affricate phoneme in Yazghulami, given the three other affricates.

Below, the contrast to the corresponding plosives is presented, followed by the contrast to corresponding fricatives, thereafter the contrast of voice and place of articulation to the other fricatives are presented.

The voiceless postalveolar affricate /tʃ/ is found to be contrasting with the alveolar plosive /t/, as indicated by the minimal pair presented in (22) below. A minimal pair is also found for the contrast of the alveolar affricate /tʃ/ and the plosive /t/, where the word /tʉj/ is loan from Tajik, although frequently used by Yazghulami speakers. For the voiced alveolar and postalveolar affricates /dʒ/ and /dʒ/, a contrast has not been affirmed to the voiced alveolar plosive /d/; the phones do however occur in analogous environments, therefore they can be regarded as phonemes in the language. These contrasts are presented in (22) below.

(22) Contrast to corresponding plosive

| /ts/ vs. /t/ | /tsuʃ/ | ‘three’ | /tʃ/ | ‘wedding’ (TJ) |
| /qʷənɨs/ | ‘nosy’ | /kʷənt/ | ‘meal’ |
| /ʧaːŋ/ | ‘dust’ | /tːaːŋ/ | ‘narrow’ |
| /ʃam/ | ‘eye’ | /tan/ | ‘family member’ |
| /dʒ/ vs. /d/ | /dzuq/ | ‘poke’ | /duk/ | ‘that’ |
| /dʒw/ | ‘yell’ | /drəl/ | ‘wall’ |
| /dʒ/ vs. /d/ | /nɛdʒ/ | ‘leave’ | /dɛd/ | ‘father’ |
| /dʒɛɾɛɾ/ | (kind of) ‘bird’ | /dɛɾəst/ | ‘correct’ |

The voiceless affricates /ts/ and /ʧ/ are found to be contrasting with their fricative counterparts /s/ and /ʃ/ respectively. No minimal pairs are found for the contrast of the voiced affricates /dʒ/ and /dʒ/ to
their fricative counterparts, although the phones occur in analogous environment. These contrasts are presented in (23) below.

(23) Contrast to corresponding fricative

| /ts/ vs. /s/   | /vats/ | ‘aunt/uncle’ | /vas/   | ‘goat’ |
| /tʃ/ vs. /ʃ/  | /dʒam/ | ‘eye’         | /jam/   | ‘belly’ |
| /dʒ/ vs. /z/  | /dʒzwak/ | ‘noicy’      | /zndaɡi/ | ‘live’ |
| /dʒ/ vs. /ʒ/  | /dʒaraɡʒ/ | ‘give’ (INF) | /znaɡʒ/ | ‘kill’ (INF) |

There is furthermore a contrast in voice between /ts/ and /dʒ/, as well as between /tʃ/ and /dʒ/, as presented in (24) below.

(24) Contrast in voice

| /ts/ vs. /dʒ/ | /tsuŋ/ | ‘three’      | /dʒuŋ/ | ‘pope’ |
| /tʃ/ vs. /dʒ/ | /tʃa:ŋ/ | ‘dust’       | /dʒa:ŋ/ | ‘war’ |

Moreover, there is a plausible contrast in place of articulation between /ts/ and /tʃ/, as well as between /dʒ/ and /dʒ/. No minimal pairs are found to affirm this, but the phonemes do occur in analogous environment, as presented in (25) below.

(25) Contrast in place of articulation

| /ts/ vs. /tʃ/ | /tsɔqʌɡ/ | ‘small’ | /tʃɔx/ | ‘rooster’ |
| /qɔntis/ | ‘nosy’ | /arɑ:mʃi:n/ | ‘rope’ |
| /dʒ/ vs. /dʒ/ | /dʒuŋ/ | ‘pope’ | /dʒuŋla/ | ‘sentence’ |
| /əndʒa:vd/ | ‘pick’ | /əndʒa:vadʒ/ | ‘sew’ (INF) |

Distribution

The affricates /ts/, /tʃ/ and /dʒ/ are found in initial, medial and final position of a word, while /dʒ/ is only found in initial position. This can be due to limitations in distribution of the phoneme, but presumably to the fact that the occurrences of the phonemes in the data are quite few. The distribution of the affricates is presented in (26) below.

(26) Distribution of affricates

| Initial: | Medial: | Final: |
| /ts/ | /tsɔqʌɡ/ | ‘small’ | /əntʂa:vadʒ/ | ‘sew’ (INF.) | /pɔtʃ/ | ‘son’ |
| /tʃ/ | /tʃarv/ | ‘fat’ | /rætʃuŋ/ | ‘mountain’ | /tʃ/ | ‘none’ |
| /dʒ/ | /dʒuŋ/ | ‘torn’ | — | — |

| /dʒ/ | /dʒad/ | ‘truth’ | /aɡdʒa/ | ‘give’ | /pɛndʒ/ | ‘five’ |
Variation

Some variation is found for the affricates, where especially the stop phase of the affricate is not realized, as presented in (27a). As /s/ tends to be voiced in between vowels (see Variation in 3.2.2 above), /ts/ tends to be voiced in similar position, giving the variation presented in (27b).

(27) Variation of affricates

a) /tsəɡaːɡ/ ‘small’ [tsəɡaːɡ] or [səɡaːɡ]
   /tʃkɪ/ ‘no one’ [tʃkɪ] or [ʃkɪ]

b) /ɑntsavadʒ/ ‘sew’ (INF) [ɑntsavadʒ] or [ʊndzavadʒ]

3.2.4 Nasals

Contrast

A phonemic contrast is found between two nasals, the bilabial /m/ and the alveolar /n/, as shown in (28) below.

(28) Contrast of nasals

/m/ vs. /n/  /miθ/ ‘day’ /niθ/ ‘sit’
   /maʃ/ ‘other’ /næʒ/ ‘from’
   /kəm/ ‘when?’ /kən/ ‘do’

Distribution

The nasal phonemes are found in initial, medial and final position of a word, as presented in (29) below.

(29) Distribution of nasals

<table>
<thead>
<tr>
<th>Initial:</th>
<th>Medial:</th>
<th>Final:</th>
</tr>
</thead>
<tbody>
<tr>
<td>/m/</td>
<td>/maqol/ ‘like’</td>
<td>/asmən/ ‘sky’</td>
</tr>
<tr>
<td>/n/</td>
<td>/nədʒ/ ‘nose’</td>
<td>/ðanaʒ/ ‘seed’</td>
</tr>
</tbody>
</table>

Variation

When preceding a plosive, /n/ assimilates to the same place of articulation as that of the plosive, and the phones [n], [ŋ] and [ɲ] therefore stand in complementary distribution. As [n] and [ŋ] only occur in the described context, they are not given any phonemic status. Examples of this variance are presented in (30) below.

(30) Complementary distribution of nasal

/n/ is realized as [n] before palatal plosives: [yaːŋc] /yaːnc/ ‘cradle’
/n/ is realized as [ŋ] before velar plosives: [laːŋg] /laːng/ ‘leg’

In the same manner, when combined with plosives, /n/ only occurs with alveolar /t/ and /d/, while /m/ only occurs with bilabial /p/ and /b/. Without access to any underlying form, it is not possible to tell if this is due to phonemic assimilation or a result of co-articulation. The combinations are presented in (31) below.
Shared place of articulation for nasal and plosive

/n/ precedes alveolar plosives: [ənˈðɔyd] /əndɔyd/ ‘go up’
/m/ precedes bilabial plosives: [dəmˈba] /dɔmba/ ‘while’

As the vowel /a/ can be omitted word initially when preceding /n/, as mentioned in 3.1.3 above, there is free variation between the [ən] and the syllabic [n] word initially, giving the variation presented in (32) below.

Free variation of nasal and /a/

/anda/ ‘there’ [ənˈda] or [nˈda]
/ən/ ‘in’ [ən] or [n]
/əndɔyd/ ‘go up’ [ənˈðɔyd] or [nˈðɔyd]
/ənɔɛ/ ‘so’ [ənˈɔɛ] or [nˈɔɛ]

3.2.5 Approximants

Contrast

The approximants /w/ and /j/ are found to be phonemic in Yazghulami. They have been compared with phonemes of the same place of articulation or of similar character, which is presented in (33) below. The phonemic status of /j/ has not been affirmed through minimal pairs; however, as it occurs in analogous environments as /ʒ/, as presented below, it is considered as phonemic within this analysis.

Contrast of approximants

/j/ vs. /ʒ/ /kənąj/ ‘do’ (2SG) /naʒ/ ‘from’
 /ɡuʃ/ ‘if’ /uʃɛ/ ‘after’
/w/ vs. /v/ /waːs/ ‘luggage’ /vaːs/ ‘goat’

Distribution

Both /w/ and /j/ are found in initial, medial and final position of a word, as presented in (34).

Distribution of approximants and the trill

<table>
<thead>
<tr>
<th></th>
<th>Initial:</th>
<th>Medial:</th>
<th>Final:</th>
</tr>
</thead>
<tbody>
<tr>
<td>/j/</td>
<td>/jast/</td>
<td>/χʷajɛɾɡ/</td>
<td>/kənąj/ ‘do’ (3SG)</td>
</tr>
<tr>
<td>/w/</td>
<td>/wadaj/</td>
<td>/awuð/</td>
<td>/znaw/ ‘daughter in law’</td>
</tr>
</tbody>
</table>

Variation

The relationship between [j] and [i] as well as [w] and [u] is not definite, as the approximants are not easily distinguished from its vowel counterparts. However, looking at the syllable structure (which is presented in 3.4.1), we see that two vowels generally do not follow after each other, and the sounds are
therefore interpreted\(^4\) as consonants here, giving words as /γui/ ‘lake’, /baj/ ‘go’, /tɔw/ ‘you’ and /mawn/ ‘fruit’ rather than γui, bai, tɔu and maun. These words are perceived as monosyllabic, which motivates the choice of /w/. Other words are perceived as polysyllabic, such as /dɔziu/ ‘yell’ and /dɔja:n/ ‘rain’, which motivates the choice of /u/ and /i/. Here, some variation is found, where the approximants can be added in between the vowels, giving the pronunciation [dɔziwu] and [dɔja:n].

### 3.2.6 The lateral approximant and the trill

**Contrast**

The lateral approximant /l/ and the trill /r/ are found to be phonemic in Yazghulami. They have been compared with phonemes of the same place of articulation or of similar character, which is presented in (35) below.

(35) Contrast of the lateral approximant and the trill

<table>
<thead>
<tr>
<th>/l/ vs. /r/</th>
<th>/kal/ ‘head’</th>
<th>/kar/ ‘dead’</th>
</tr>
</thead>
<tbody>
<tr>
<td>/r/ vs. /d/</td>
<td>/rayd/ ‘stayed’</td>
<td>/dayd/ ‘cut’</td>
</tr>
<tr>
<td>/r/ vs. /ʒ/</td>
<td>/randaj/ ‘there’</td>
<td>/ɣandɾ/ ‘chain’</td>
</tr>
<tr>
<td>/ʒur/ ‘sun’</td>
<td>/χəur/ ‘sweet’</td>
<td></td>
</tr>
<tr>
<td>/r/ vs. /u/</td>
<td>/gard/ ‘round’</td>
<td>/raɾd/ ‘stay’</td>
</tr>
<tr>
<td>/r/ vs. /ə/</td>
<td>/randaj/ ‘there’</td>
<td>/ɾam/ ‘sorrow’</td>
</tr>
</tbody>
</table>

**Distribution**

Both /l/ and /r/ are found in initial, medial and final position of a word, as presented in (36) below.

(36) Distribution of the lateral approximant and the trill

<table>
<thead>
<tr>
<th>Initial:</th>
<th>Medial:</th>
<th>Final:</th>
</tr>
</thead>
<tbody>
<tr>
<td>/l/</td>
<td>/lɔv/ ‘voice’</td>
<td>/γalaq/ ‘bad’</td>
</tr>
<tr>
<td>/r/</td>
<td>/raxk/ ‘louse’</td>
<td>/zaray/ ‘ice’</td>
</tr>
<tr>
<td>/j/</td>
<td>/jast/ ‘have’</td>
<td>/χ’ajɛr/ ‘mill’</td>
</tr>
<tr>
<td>/w/</td>
<td>/wadaŋ/ ‘lamb’</td>
<td>/awuŋ/ ‘change’</td>
</tr>
</tbody>
</table>

**Variation**

The trill is often found to be realized as a tap, giving free variation between [ɾ] and [ɾ] as presented in (37) below.

(37) Variation of the trill

| /raxk/ ‘louse’ | [raxk] or [ɾaxk] |
| /manɔr/ ‘a lot’ | [manɔr] or [ɾmanɔr] |

\(^4\) Clark et al. (2007) discuss the issue of interpretation, saying that “certain sounds will have to be interpreted within the linguistic system of which they are a part” (2007:75), especially referring to semivowels.
3.2.7 Contrast in manner of articulation

The plosives and fricatives that have the same place of articulation have been compared, as allophony could be possible. No such cases are, however, found, but contrast is affirmed in the pairs of /b/ and /v/, /t/ and /θ/, /d/ and /ð/, /k/ and /x/, and finally /g/ and /ɣ/. No minimal pairs are found contrasting /p/ with /f/, and /q/ with /ɣ/, but the phonemes do, however, occur in analogous environment, which indicates that they are not allophones. The contrasts are shown in (38) below.

(38) Contrasts in manner of articulation

| /p/ vs. /f/ | /gæp/ | ‘word’ | /ɣaf/ | ‘pour’ |
| /ʃapa/ | ‘knock down’ | /nafas/ | ‘breath’ |
| /b/ vs. /v/ | /bijaːn/ | ‘evening’ | /vijaːn/ | ‘put’ (3SG IMP) |
| /t/ vs. /θ/ | /mɪt/ | ‘become’ | /mɪθ/ | ‘day’ |
| /d/ vs. /ð/ | /dɛd/ | ‘father’ | /ðɛd/ | ‘hit’ (PST) |
| /k/ vs. /x/ | /kənɪn/ | ‘do’ (1SG) | /xənɪn/ | ‘hear’ (1SG) |
| /q/ vs. /ɣ/ | /qatɔl/ | ‘big’ | /zara/ | ‘wife’ |
| /q/ vs. /ɣ/ | /alaq/ | ‘bad’ | /zaraq/ | ‘ice’ |

The distribution and variation of the plosives and fricatives are presented above in 3.2.1 and 3.2.2 respectively.

3.3 General phonological processes

Some general phonological processes are found for phonemes of different manners of articulation. Devoicing is such a process, as voiced plosives, fricatives and affricates and the trill are generally devoiced in utterance final position. This is exemplified in (39) below.

(39) Devoicing in utterance final position

| Plosive: | /wuɡ/ | ‘one’ | Utterance medial: | [wuɡ] | but | [wuk] |
| Fricative: | /znas/ | ‘snow’ | [znas] | but | [znay] |
| Affricate: | /kənadʒ/ | ‘do’ (INF) | [kənadʒ] | but | [kənaʃ] |
| Trill: | /manɔɾ/ | ‘a lot’ | [manɔɾ] | but | [manɔɾ] |

The process of voicing is shared by /s/ and /ʃs/, which both tend to be voiced in between vowels or voiced segments. Examples of this are presented in the Variation sections of 3.2.2 and 3.2.3 respectively. Voicing is not found to occur for other voiceless consonants, but be a process solely for /s/ and /ʃs/. It is noticeable how the realization of these phonemes is similar to each other.

As mentioned in Variation in 3.2.1, voiceless plosives are aspirated in word initial position and initially in stressed syllables, and utterance finally. The voiced plosives that are devoiced in utterance final position can furthermore also be aspirated in this position.
Suprasegmentals

We will start by looking at the structure of the syllable, and thereafter turn to stress in words.

3.4.1 Syllable structure

The syllable structure of Yazghulami allows for two consonants in the onset or two in the coda. Syllables with clusters both in the onset and the coda have, however, not been found. A list of syllables possible in Yazghulami is presented in (40) below.

(40) Syllable structure

<table>
<thead>
<tr>
<th>Structure</th>
<th>Example</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>/ɔ/</td>
<td>‘yes’</td>
</tr>
<tr>
<td>VC</td>
<td>/aːs/</td>
<td>‘I’</td>
</tr>
<tr>
<td>VCC</td>
<td>/uvd/</td>
<td>‘seven’</td>
</tr>
<tr>
<td>CV</td>
<td>/ki/</td>
<td>‘who’</td>
</tr>
<tr>
<td>CVC</td>
<td>/jaːt/</td>
<td>‘come (PST)’</td>
</tr>
<tr>
<td>CVCC</td>
<td>/laft/</td>
<td>‘say (PST)’</td>
</tr>
<tr>
<td>CCV</td>
<td>/ʃtu/</td>
<td>‘how’</td>
</tr>
<tr>
<td>CCVC</td>
<td>/vred/</td>
<td>‘older brother’</td>
</tr>
</tbody>
</table>

The combinations of consonants that can occur in clusters differ somewhat in onsets and codas. Below, possible combinations will be described, starting from the nucleus and outwards; i.e., onsets are described from right to left and codas from left to right.

In onsets, different combinations of consonants can occur in clusters. A trill can be preceded by a fricative or a plosive, as demonstrated with examples in (41a). The onset can also consist of an approximant preceded by a fricative or a nasal, as presented in (41b). Fricatives can moreover precede plosives or nasals, as exemplified in (41c) and (41d) respectively. One single occurrence is found where a lateral approximant is preceded by a plosive, which might show a possible but less frequent structure of a consonant cluster, or be a cluster of a loan word that follows the phonotactics of the source language; this is presented in (41e).

(41) Clusters of onsets

a) Fricative + trill:  /vred/  ‘brother’
    Plosive + trill:  /prd/  ‘front’

b) Fricative + approximant:  /zwurw/  ‘warm water’
    Nasal + approximant  /njud/  ‘hold’

c) Fricative + plosive:  /spaw/  ‘louse’

d) Fricative + nasal:  /znaw/  ‘daughter in law’

e) Possible plosive + lateral approximant:  /blalukat/  (a kind of) ‘rock’

In codas, clusters of two consonants seem to be possible as well, but in somewhat different combinations than in the onsets. The most common combination seems to be a fricative followed by a plosive; and one occurrence has also been found where a fricative is followed by another fricative, both demonstrated in (42a) below. The coda can also consist of a trill followed by a fricative, plosive or nasal, as presented in (42b), and also of an approximant followed by a plosive or a nasal, as
presented in (42c). The coda can moreover consist of a nasal followed by either a plosive or an approximant, as presented in (42d).

(42) Clusters of codas

a) Fricative + plosive: /kɪθk/ ‘leaf’  
   Fricative + fricative: /wˀafs/ ‘come back’

b) Trill + fricative: /ðɜrg/ ‘late’  
   Trill + plosive: /ɡard/ ‘round’  
   Trill + nasal: /varm/ ‘cloud’

c) Approximant + plosive: /lɔjɪd/ ‘separate’  
   Approximant + nasal: /wawn/ ‘wool’

d) Nasal + plosive: /lanɡ/ ‘leg’  
   Nasal + affricate: /qʷɔnst/ ‘nosy’

Voiceless consonants are generally combined with other voiceless consonants, and voiced are generally combined with voiced, giving either voiced or voiceless clusters. The exceptions are clusters with nasals or the trill, as they can be combined with both voiced and voiceless consonants. Most clusters seem to occur in the stem of the words and are not due to co-articulation with following suffixes, as the suffixes found in the data most often start with a vowel. However, when suffixes consists of only a consonant, as -t for past tense marking on verb stems, it changes to -d when combined with a voiced consonant; compare laf-t ‘say-PST’ with way-d ‘cry-PST’. The same exception is however present here, as e.g. the word win-t ‘see-PST’ still has a voiceless ending as it is combined with a voiced nasal.

No indication of instable vowels has been found; the dropping of /ə/ as described in 3.1.3 is not found to be caused by any specific syllable construction.

3.4.2 Word stress

No lexical contrasts have been found due to the position of stress in Yazghulami. The patterns of word stress will be described below. It is found that the patterns differ somewhat between the stress on verbs and the stress on nouns. We will start by looking at verbs, and then move on to the pattern for nouns.

Regarding word stress for verbs, the last syllable in generally stressed. This is regardless of inflection, as presented in (43a). Some affixes do however not fall under this rule, and the ones found in this study is the negative prefix na-, which is always stressed and therefore the stress moves to the first syllable of the word; and furthermore the suffix -da, which has some aspectual function that has not been investigated for this study; and moreover the connective suffix -at(a). When -da and -at(a) is used, the stress falls on the second to last syllable, as presented in (43b).

(43) Stress pattern of verbs

a) Stress on last syllable: /niθədʒ/ sit.INF ‘to sit’  
   /badˈin/ go-ISG.PRS ‘I go’

b) Exceptions: na- /ˈna.ɛrg/ neg-DO.PST ‘didn’t do’  
   -da /niθəmda/ nit-IPL.PRS-ASP ‘we (are) sit(ting)’  
   -at(a) /ˈmadat/ become.PST-CONN ‘became and …’
As for nouns, the last syllable is stressed on words in their basic form, as shown in (44a). What differs from the stress pattern of verbs is that the stress does not move when the word in inflected, i.e. the affix are unstressed while the last syllable of the stem is still stressed, as presented in (44b). A few exceptions have, however, been found where the affixes are stressed, which occurs for the 3rd person plural suffix –an, and the plural parkers –ar and –aθ as presented in (44c). The grammatical difference between the two plural markers has not been investigated in this study.

(44) Stress pattern for nouns

a) Stress in basic form: /awˈrat/ woman ‘woman’
   /tɪˈmɔʊ/ egg ‘egg’

b) Stress on stem: /ˈvaɪsɔm/ aunt-1PL.PRS ‘Aunt’
   /ˈnaːnra/ mother-to ‘to mother’

c) Exceptions: -an /tanˈan/ family-member-3PL ‘family member’
   -ar /vrədˈar/ brother-PL ‘brothers’
   -aθ /gapˈaθ/ word-PL ‘words’

---

5 For past and perfect tenses, the verbal inflection is not placed on the verb but on the first main constituent of the clause (Payne 1989:422), and nouns can therefore attain verbal inflection.
4 Discussion

Several aspects of this study need to be lifted up for discussion, both regarding the method and the results, which will be presented in turn below. Finally, conclusions are made with suggestions for further applications and research.

4.1 Discussion of method

Below, we will look at some aspects of the method which may have affected the outcome of this study, such as the fact that only speakers from Dushanbe have been consulted, and moreover that these speakers have been mainly women; and that the resulting data set is quite small.

It has not been possible to show or much less prove any dialectal differences in Yazghulami within this study due to the fact that only recordings of speakers living in Dushanbe have been used. Êdel’man (1987 in Tiessen et al 2010:7) noted some dialectal variation, and differences between Upper and Lower Yazgulyam (Lewis et al. 2016) are furthermore mentioned in Ethnologue, presumably referring to dialectal differences of northern and southern villages in the Yazghulom valley. However, it is added that the differences are small. No examples are presented of how the differences are displayed in the dialects, and no such addition has been possible in the present study. It is also possible that there are some dialectal differences between speakers in the Yazghulom valley and Dushanbe, but this still remains to be studied. It is therefore not possible to assure that the sample of consultants, and therefore also the results, are representative for Yazghulami as a whole. It should, however, be noted that the background of the consultants vary to some degree, although not enough to find any dialectal differences.

What might have affected the outcome of the results is the fact that the sample of informants has not been balanced regarding gender; with only one exception, women have been consulted for data collection. The usage of the language might differ between the genders, especially since Yazghulami men generally have a higher degree of education than Yazghulami women. The language of the men might therefore be more influenced by Tajik and Russian in terms of loanwords and possibly also with a pronunciation closer to that of the source language. With this in mind, it is possible that the fact that women have been consulted for this study has given a result less influenced by the other languages spoken in the region. However, the female speakers in Dushanbe plausibly have more contact with Tajik and Russian than the female speakers in the Yazghulom valley. Some diversity in the sample of informants would therefore have been desirable, both regarding gender and place of living.

The data set that this study is based on is quite small, where the recorded word lists have been of more help than the recorded monologues in establishing contrasts between phonemes, although the lists constitute the smaller part of the data. Its limitations are especially noticeable when establishing the possible consonant clusters in onsets and codas, as some combinations of consonants only occur a few times in the data. Regarding the less frequent and at the same time less certain phonemes presented in this study, more data, especially in the form of elicitations focusing on these specific phonemes, would probably have been helpful.
4.2 Discussion of results

Characteristic for the phonology of Yazghulami is the rich inventory of back consonants, possibly differentiating between 15 different phonemes in palatal, velar and uvular positions. The wide range of fricatives, from labiodentals to uvulars, is also characteristic for the language, as well as the labialized sets of back plosives and fricatives. The result regarding the inventory of phonemes is very similar to that presented by Êdel’man and Dodykhudoeva (2009) as well as by Payne (1989). Three main differences are found, one for syllable structure, one for vowels and one for consonants, as presented below.

Regarding the syllable structure, a restriction to two consonants in the onset and two in the coda has been found, although Payne (1989:427) states that the coda can consist of up to three consonants. He presents, however, no examples to strengthen this claim, and no words with such codas are found in the data of the present study.

Regarding vowels, a contrast in position between the vowels /ʉ/ and /u/ have been found in this study, while this contrast is regarded as one in roundedness by Êdel’man and Dodykhudoeva (2009) and Payne (1989). Both of the two vowels are found to be rounded in the present analysis, and the phonemes are furthermore found to be pronounced at different positions, centered and back respectively, the reason for which no contrast of roundedness is presented here. To further affirm whether the vowels are rounded, video recordings of lips during articulation would be needed.

As for consonants, no contrast between the palatal plosives [c] and [j] has been found, instead these are considered to be in complementary distribution. This is not the case in Êdel’man and Dodykhudoeva (2009) and Payne (1989), where the two phones are considered as phonemes. Payne supports this with findings of [c] and [j] in similar position, giving the words cərov ‘hole in log’ and ɟəndaɡ ‘prickles’, where [j] is found in initial position, a position in which [j] has not occurred in the data of the present study. The differing results may be due to too scanty data, as mentioned in 2.2 above; possible dialectal differences between the informants of this study and the ones consulted for the study of Payne; or possibly a change in the usage of the palatal plosives. As mentioned in 3.2.1, the status of [c] and [j] as phonemes or allophones is still somewhat uncertain. It is therefore possible that there is a phonemic difference between the two phones, although nothing has been found to strengthen such a claim within this study. Additional research is needed to assert their actual status.

As mentioned in 3, the phonemic status of the labialized plosives /kʷ/, /qʷ/ and /qʷ/ and the labialized fricatives /xʷ/, /χʷ/ and /χʷ/, as well as the affricate /dəz/, is furthermore still uncertain. Within this study, there is no evidence in the form of minimal pairs that the labialized plosives stand in direct contrast to their non-labialized counterparts, at the same time as nothing has been found to trigger the labialization of these phones. The affricate /dəz/ differs from the other affricates, both in terms of distribution and duration. It is possible that the contrast between /dəz/ and /təs/ is about to disappear, which would explain the low frequency and the variance where /təs/ can be voiced between voiced segments. Until more certain indicators are found, the status of the labialized plosives and fricatives and the affricate /dəz/ is still questioned.

The suggested phoneme inventory of Yazghulami is quite symmetrical as a whole, with sets of voiced and voiceless plosives and fricatives, and given places of articulation are used for several different phonemes. With regards to symmetry, [j] could be expected to be phonemic, but as mentioned above, the phone has not been found to contrast with [c]. Another gap in the symmetry of the system is that there is no voiced labialized velar fricative, [γʷ]. As mentioned in 3.2.2, the phone overlaps in place
and manner of articulation with [w], which explains the gap in the set of labialized fricatives. The voiceless fricative /q/ has no voiced counterpart, but given the fact that /ɬ/ is quite rare in phonological systems, it is not surprising that it is not found in the phonology of Yazghulami.

Given the definitions by Maddieson (2013a) in WALS (The World Atlas of Language Structure), the consonant inventory of Yazghulami with its 36 consonants is typologically considered to be large. The consonant inventory is furthermore larger than that of the other Pamir languages (Payne 1989:424–5), which have moderately large consonant inventories according to Maddieson’s definitions. None of the other Pamir languages display labialized consonants or palatal stops, but with these exceptions, the consonant inventory of Yazghulami is the same as that of the languages in the Shughni-Rushani group. The Yazghulami inventory of 8 vowels is typologically considered to be large according to Maddieson’s (2013b) definitions. The vowel inventories of the Pamir languages varies from 6 to 10, where the languages with 9 to 10 vowel phonemes display contrasts in length, while the languages with 6 to 7 vowel phonemes do not (Payne 1989:426). Yazghulami is the only language in the examples by Payne which displays 8 vowel phonemes, although not all Pamir languages are covered in his presentation of vowel systems.

The fact that the languages of the Shughni-Rushani group display almost similar consonant inventories to the inventory described in this study further strengthens the contrasts found here. Of interest is the phonemic approximant /d̪z̪/ in these languages, which further suggests that this phone is phonemic in Yazghulami. However, as no other Pamir languages display sets of labialized consonants or palatal stops, no support is given for these suggested phonemes through the related languages.

Moreover, the syllable structure presented in this paper should be viewed with some caution. Due to the tendency of /ə/ to be omitted, it is possible that what is interpreted as a consonant cluster instead has the structure of /CəC/, although this structure is not apparent in the realization, and the sequence is therefore interpreted as a cluster of consonants.

4.3 Conclusion

The aim of this study was to describe the phonology of Yazghulami in terms of contrastive segments and their variation, as well as suprasegmental features such as the syllable structure and stress patterns. The phoneme inventory presented in this paper should be viewed with awareness of the fact that not all of the suggested phonemes have been affirmed as phonemic.

For future applications of the results of this study, it would be desirable to test the results together with speakers of Yazghulami, for instance in workshop format experimenting with writing, in order to compile a user-friendly orthography of the language. Aspects to consider are e.g. if the contrast of length needs to be represented, as well as the occurrence of [h] found in loan words. Applications such as a compiled orthography would hopefully broaden the domains in which the language is used, making it possible for the speakers to document not only their language but also their own stories and history. In the long run, it could hopefully strengthen the status of and attitudes towards this endangered language.

---

6 In UPSID (Maddieson & Precoda 1984), only 3.10 % of the languages in the sample have a phonemic /q/, and only 18.64 % of the languages with a phonemic /q/ also display a phonemic /ɢ/.

7 In Maddieson’s (2013b) definition only qualitative contrasts are counted; a vowel pair contrasting in duration is therefore regarded as one vowel. With this definition, Yazghulami has 7 vowel phonemes, a number that is still regarded as large.
As mentioned in 3.2, further research is needed to confirm the phonemic status of a number of phones that are still uncertain. However, it would not only be interesting to further investigate the phonology of Yazghulami, but also to examine its morphological and syntactic features, until now only summarily described by Èdel’man (see 1966; 2000). Furthermore, areal-typological surveys would be interesting to carry out in order to show how Yazghulami relates to Iranian languages as well as the non-Iranian languages spoken in the region. This would contribute not only to our academic knowledge of contact patterns and the linguistic diversity in this part of the world, but also give the speakers of Yazghulami a deeper knowledge of their own language and in which ways it is similar to and different from other languages.

To conclude, the phonology of Yazghulami displays a large set of phonemes, to some extent distinct from phoneme inventories of related languages. The sets of labialized plosives and fricatives are especially characteristic, although not fully affirmed as phonemic in this study. Additional research is still needed to fully explore all aspects of Yazghulami phonology.
References


## Appendix A

Below, a Swadesh list of 207 words is presented.

<table>
<thead>
<tr>
<th>No.</th>
<th>Yazghulami</th>
<th>English</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>/a:s/</td>
<td>I</td>
<td>40</td>
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</tr>
<tr>
<td>2</td>
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<td>/wεχ/</td>
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<td>/δεδ/</td>
</tr>
<tr>
<td>5</td>
<td>/tɔmɔy/</td>
<td>you (PL)</td>
<td>44</td>
<td>/δύονδον/</td>
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<td>6</td>
<td>/tʃ/</td>
<td>they</td>
<td>45</td>
<td>/mαναυ/</td>
</tr>
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<td>/pαράνδα/ (TJ)</td>
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</tr>
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<td>66</td>
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<td>/vɔz/</td>
<td>long</td>
<td>67</td>
<td>/καρν/</td>
</tr>
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<td>29</td>
<td>—</td>
<td>wide</td>
<td>68</td>
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<td>thick</td>
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</tr>
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<td>70</td>
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<td>small</td>
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<td>/pust/, /qant/</td>
<td>short</td>
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<td>thin</td>
<td>74</td>
<td>/τεμαν/</td>
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<td>36</td>
<td>/awrat/</td>
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<td>75</td>
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<td>/weʃyup/</td>
<td>man (adult male)</td>
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<td>/ηαχ/</td>
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<td>38</td>
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<td></td>
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<td>/καρν/</td>
</tr>
</tbody>
</table>
80. /peð/ foot
81. /laŋ/ leg
82. /zen/ knee
83. /dust/ hand
84. /xawən/ wing
85. /jam/ belly
86. /rəd/ guts
87. /gorən/ neck
88. /arqa/ back
89. /dɔt/ breast
90. /zawə/ heart
91. /θəd/ liver
92. /brazadʒ/ to drink
93. /chronoʒ/ to eat
94. /chronoŋadʒ/ to bite
95. /rakəŋadʒ/ to suck
96. /təŋ kanadʒ/ to spit
97. /qaŋ kanadʒ/ to vomit
98. /paf kanadʒ/ to blow
99. /nafas xaraxadʒ/ to breathe
100. /xandadʒ/ to laugh
101. /winadʒ/ to see
102. /xonadʒ/ to hear
103. /vaŋanaŋadʒ/ to know
104. /andexa kanadʒ/ to think
105. /bi kanadʒ/ to smell
106. /x=ajek viadʒ/ to fear
107. /pəsədʒ/ to sleep
108. /zmdaqi knadʒ/ to live
109. /maradʒ/ to die
110. /xanadʒ/ to kill
111. /rafadʒ/ to fight
112. /xəw kanadʒ/ to hunt
113. /dajadʒ/ to hit
114. /kibadʒ/ to cut
115. /varandadʒ/ to split
116. /kalzak dajadʒ/ to stab
117. — to scratch
118. /xəkəraŋadʒ/ to dig
119. /waŋaŋadʒ/ to swim
120. /xuzzadʒ/ to fly
121. /təŋadʒ/ to walk
122. /zajadʒ/ to come
123. /pəsədʒ/ to lie (as in a bed)
124. /niθadʒ/ to sit
125. /wɔraŋadʒ/ to stand
126. /fargadʒ/ to turn (INTR.)
127. /wəbədʒ/ to fall
128. /dəraŋadʒ/ to give
129. /zaŋadʒ/ to hold
130. /zaŋadʒ/ to squeeze
131. /malaŋadʒ/ to rub
132. /zhaxadʒ/ to wash
133. /təzə kənaŋadʒ/ to wipe
134. /xaraxadʒ/ to pull
135. /fəsəbədʒ/ to push
136. /wədəŋadʒ/ to throw
137. /vəndadʒ/ to tie
138. /əntəsədʒ/ to sew
139. /isəb kanadʒ/ to count
140. /lafadʒ/ to say
141. /sawə lafadʒ/ to sing
142. /bazək kanadʒ/ to play
143. /xənaur viədʒ/ to float
144. /rawən viədʒ/ to flow
145. /xaraŋ kanadʒ/ to freeze
146. /xədmasadʒ/ to swell
147. /xəwur/ sun
148. /mast/ moon
149. /xətaraŋ/ star
150. /ʃəʃ/ water
151. /sən/ rain
152. /xəd xəxəlv/ river
153. /səl/ lake
154. /bəhər/ sea
155. /xəɾ/ salt
156. /kap/ stone
157. /xəsrəq/ sand
158. /ʃaŋaŋ/ dust
159. /smaŋ/ earth
160. /varəŋ/ cloud
161. /xəmən/ fog
162. /asəmən/ sky
163. /həʃəs/ wind
164. /znəʃ/ snow
165. /zaraŋ/ ice
166. /dəd/ smoke
167. /ʃətʃ/ fire
168. /xəkoʃəɾ/ ash
169. /xəxadʒ/ to burn
Appendix B

A phonetic transcription of an extraction of a recorded text in Yazghulami is presented below, followed by a phonological transcription and a free translation of the same text.

Phonetic transcription:
[ˈwortən wanda ɔ̃ pʰaˈtəf ʰkʰudəm / pʰaˈtəf ʰkʰudəm as ne ɔ̃ze ˈdə ˈwɔanda nɪsˈa / hətɪ ɔ̃  paˈtəf ʰcʰaɾdə ʰkʰ ˈnɪn / ˈajdəʒə nak ɪz ʰkʰi ˈvarda ɪz ʰkʰi ˈvaramda ˈχʰerəma nɪtʰəmdə / ˈʃkʰojətə ˈʃkʰojətə ʰkʰ ˈnənəm ˈnawɪˌtʰa ɔ̃ / ˈdɔɾɔ ʰhəzəɾ vɔɾ ʃɛkəɾ, ʰhəməj ˈtʃiˌa ˈsadat / naq ˈdəmba ˈʃkʰɔja ˈəfə ˈwɔanda nɪˈsta nɪˈstədə / ˈʃkʰojətə ɛ ˈnɛstə / ˈdɔɾɔ ʰhaˈzɔɾ vɔɾ ʃɛkəɾ, ʰhəməj ˈtʃiˌa ˈsadat / naq ˈdəmba ˈʃkʰojətə ˈəfə ˈwɔanda nɪˈsta nɪˈstədə / ˈʃkʰojətə ɛ ˈnɛstə]

Phonological transcription:
/aːzəm wanda ɔ̃ pataʃ kudəm / pataʃ kudəm az ɔ̃ərda wanda rənda nisˈa / hətɪ ɔ̃  paˈtəf ʰcʰaɾdə ʰkʰ ˈnɪn / ˈajdəʒə nak ɪz ʰkʰi ˈvarda ɪz ʰkʰi ˈvaramda ˈχʰerəma nɪtʰəmdə / ˈʃkʰojətə ˈʃkʰojətə ʰkʰ ˈnənəm ˈnawɪˌtʰa ɔ̃ / ˈdɔɾɔ ʰhəzəɾ vɔɾ ʃɛkəɾ, ʰhəməj ˈtʃiˌa ˈsadat / naq ˈdəmba ˈʃkʰojətə ɛ ˈnɛstə / ˈdɔɾɔ ʰhaˈzɔɾ vɔɾ ʃɛkəɾ, ʰhəməj ˈtʃiˌa ˈsadat / naq ˈdəmba, ˈʃkʰojətə ɛ ˈnɛstə / ˈdɔɾɔ ʰhəzəɾ vɔɾ ʃɛkəɾ, ʰhəməj ˈtʃiˌa ˈsadat / naq ˈdəmba / ˈʃkʰojətə ɛ ˈnɛstə / ˈdɔɾɔ ʰhəzəɾ vɔɾ ʃɛkəɾ, ʰhəməj ˈtʃiˌa ˈsadat / naq ˈdəmba / ˈʃkʰojətə ɛ ˈnɛstə]

Free translation:
‘I live here in my cousin’s house, I now stay in my cousin’s house. I work near my cousin. She brings me everything, everything to eat and a place to stay. I have no other complaints. I praise God a thousand times, everything is well. For a long time, for two and a half years, I have not seen my mother, my brother and my one sister.’