UNIVERSITY OF HELSINKI

The phonology of Gangou: a Chinese variety of the Amdo Sprachbund

Richard Kerbs

Master's thesis

East Asian Studies

Department of World Cultures

University of Helsinki

May 2019

HELSINGIN YLIOPISTO
HELSINGFORS UNIVERSITET
UNIVERSITY OF HELSINKI

Tiedekunta – Fakultet – Faculty Faculty of Arts		Koulutusohjelma – Utbildningsprogram – Degree Programme East Asian Studies
Opintosuunta – Studieinriktning – Study Track Chinese Line of Studies		
Tekijä – Författare – Author Rudolph Henric Richard Kerbs		
Työn nimi – Arbetets titel – Title The Phonology of Gangou – a Chinese Variety of the Amdo Sprachbund		
Työn laji – Arbetets art – Level Master's Thesis	Aika – Datum – Month and year 18.04.2019	Sivumäärä– Sidoantal – Number of pages 77

Tiivistelmä – Referat – Abstract

This thesis examines the phonology of Gangou, a Sinitic (Chinese) variety spoken in Minhe County, Qinghai Province, China. Gangou is a variety of Mandarin, a.k.a. Northern Chinese, that belongs to what has been termed the Amdo Sprachbund, a linguistic area consisting of Sinitic, Bodic, Mongolic, and Turkic languages which have converged structurally towards a common Altaic prototype. Although the languages of the Amdo Sprachbund have started to receive more attention recently, Gangou remains an underdocumented language. Of the few articles that have been published, none so far has been dedicated to phonology, and it is the aim of this thesis to fill this gap.

The material for the thesis was elicited during a field trip in Xining and Gangou, Qinghai Province, in September–October 2017. The data has been analysed based on general phonemic theory; no formalist theory of phonology has been adopted. The focus is primarily synchronic, but attention is paid to diachronic development where it facilitates the explanation of features that are peculiar to Gangou as compared to other Mandarin varieties such as Standard Mandarin.

The primary goal of the present thesis is to determine the phonemes and tonemes of Gangou from a synchronic perspective. A secondary goal is to manifest the peculiarities of Gangou as compared to Standard Mandarin, which is the most widely known member of the Mandarin group of Chinese languages. Attempts have also been made to explain these unique features as possible contact-induced changes.

As for the phonology of the languages of the Amdo Sprachbund, they represent either a Bodic or a Sinitic type. The results of this thesis show that Gangou exhibits a Sinitic orientation; it has a phonemic inventory that is close to that of other Mandarin varieties and a C (initial consonant) M (medial) V (vowel) F (final) syllable structure that is typical of Sinitic. Furthermore, Gangou is tonal, having three tones in syllable-initial position, which is also a non-Bodic (i.e. Sinitic) feature. A comparison between the tone systems of Gangou and Standard Mandarin shows that there a correspondence between Gangou and Standard Mandarin tones can be detected, which is to be expected. However, there are also many inconsistencies, especially in non-final syllables. Tone reduction may be one explanation to these inconsistencies.

Avainsanat – Nyckelord – Keywords
Gangou, phonology, tonology, Amdo Sprachbund, Qinghai Chinese

Säilytyspaikka – Förvaringställe – Where deposited
E-Thesis, Helka-tietokanta

Muita tietoja – Övriga uppgifter – Additional information

Table of Contents

1 Introduction 1

1.1 Gangou Chinese 1

1.2 Gangou Township 3

1.3 Language contact and the Amdo Sprachbund 5

1.4 Previous research 9

1.5 The transcription system used in the present thesis 9

2 Theoretical concepts and method 11

2.1 Theoretical concepts 11

2.1.1 Syllable structure 11

2.1.2 Underlying representations 13

2.1.3 Suprasegmental representations 18

2.2 Method 19

3 Segmental phonology 19

3.1 Initials 20

3.2.1 Stops 20

3.2.2 Affricates 25

3.2.3 Fricatives 27

3.2.4 Nasals 30

3.2.5 Approximants 31

3.2.6 Liquid 33

3.3 Medial glides 33

3.3.1 The palatal glide /i/ 34

3.3.2 The labiovelar glide /u/ 34

3.3.3 The palato-labial glide /y/ 35

3.4 Vowels 36

3.4.1 The vowel *a* 38
3.4.2 The vowel *ai* 39
3.4.3 The vowel *e* 40
3.4.4 The vowel *ei* 41
3.4.5 The vowel *eu* 42
3.4.6 The vowel *o* 42
3.4.7 The fricative vowels *i, y* and *u* 43
3.4.8 Syllabified consonants 46
3.5 Finals 47
3.5.1 Final glides /i/ and /u/ 47
3.5.2 Final nasals 49
3.5.3 Rhotic suffix *-er* 51
4 Suprasegmental phonology 53
4.1 Reduced syllables 53
4.2 Tone 54
4.2.1 Monosyllables 56
4.2.2 Disyllables 58
4.2.3 Summary of Gangou tones 65
5 Conclusions 66
Appendix 68
References 70

List of tables and figures

Table 1. Population of Gangou Township in 1990 3
Table 2: Population of Minhe County in 2011 4
Table 3: Comparison between pinyin and Gangou 10
Table 4: Possible syllables in Gangou. 13
Table 5: Gangou initials. 20
Table 6: Gangou stop consonants. 21

Table 7: Gangou affricates. 25
Table 8: Gangou vowel phonemes. 36
Table 9: Gangou nuclear and combined vowels. 36
Table 10: Gangou fricative vowels. 37
Table 11: Syllables containing final /-w/ 48
Table 12: Syllables containing final /-j/ 49
Table 13: Gangou nasalized vowels. 49
Table 14: Gangou codas with the rhotic suffix -er 52
Table 15: Correspondence between Standard Mandarin and Gangou tones. 65
Table 16. Tone systems of some Amdo Sinitic languages. 66

Figure 1: Traditional analysis of a Chinese syllable. 12
Figure 2: Syllable structure according to Duanmu (2007) 12

1 Introduction

The aim of this thesis is to provide a description of the phonology of Gangou, a variety of Mandarin Chinese spoken in Qinghai Province, China. The research is based on elicited data, collected with native speakers of Gangou during my one-month stay in Xining and Gangou Township in September 2017, as well as secondary sources such as articles describing different parts of Gangou grammar. As of yet, no description of Gangou phonology has been written, and it is the primary goal of this thesis to fill this gap. Another purpose of this study is to contribute to the typological research of Sinitic languages on the one hand, and of the languages in the Amdo Sprachbund on the other. The research questions are thus: What are the phonemes and tonemes of Gangou, how are they different from Standard Mandarin, and how can this be explained? Firstly, the most important task has been to determine the phonemes and tonemes of Gangou based on phonemic analysis. Secondly, Standard Mandarin has been chosen as an object of comparison, since it has been considered useful for highlighting the peculiarities of Gangou, and it is the Sinitic variety that I am most familiar with. Thirdly, attempts have been made to explain divergences between Standard Mandarin and Gangou as possible contact-induced changes due to the language contact context that Gangou is a part of.

The structure of this thesis is as follows: section 2 is an overview of the theoretical concepts used throughout the thesis and the method of data elicitation and analysis. Sections 3 and 4 form the bulk of the thesis; section 3 describes the segmental phonology of Gangou while suprasegmental features are dealt with in section 4. Some final thoughts and suggestions for further study are given in section 5.

1.1 Gangou Chinese

Gangou Chinese is known as *gāngōu huà* 甘溝話 'Gangou vernacular' or *gāngōu fāngyán* 甘溝方言 'Gangou dialect' in Chinese, referring to the "vernacular" or the "dialect" of Gangou Township respectively. These are also the terms used by the speakers themselves to refer to their own language. In English, it has been variously called Gangou Chinese and the Gangou Chinese dialect among other things. In the rest of the present thesis, Gangou Chinese is referred to as Gangou.

There are an estimated 15,000 speakers of Gangou. In 2011, there were 11,852 people living in Gangou Township, of which most are thought to speak Gangou. Apart from these, there are some additional thousands of speakers in surrounding areas. The majority of Gangou speakers thus live in Gangou Township, Qinghai Province, China (see section 1.2). According to Zhu et al. (1997), Gangou is also spoken in areas of Qianhe Township to the northeast and Manping Town to the north, as well as in Zhujialing Village in Zhongchuan Township, some 15 kilometres to the south of Gangou Township. The fact that Gangou is referred to as *gāngōu huà* also in these neighbouring areas points to the recognition of Gangou as a clearly distinct entity within the broader "Minhe and Ledu Dialect" group, one of three varieties of Chinese spoken in Qinghai, as described in section 1.3. (Zhu et al. 1997)

Like other Mandarin varieties in the Amdo area, Gangou is known for its abundancy of non-Sinitic ("Altaic") features on both the grammatical and phonological level, to the extent that it has been called a mixed language (Zhu et al. 1997, Slater 2001). Mantaro Hashimoto has proposed a typological scale according to which Altaic features in the Sinitic languages increase the more north one goes, while Taic feature increase the more south one goes (Chappell 2006: 335). Gangou, along with other Sinitic varieties spoken in the Qinghai–Gansu area, is located on the far north end on this scale. Even so, the genetic affiliation of Gangou is clear; it is a Sinitic language belonging to the Northwestern branch of Mandarin Chinese, or Northern Chinese 北方話 (Chappell 2006: 331). This is also the stance taken by Peyraube (2017) and Janhunen (2006). The non-Sinitic features that are characteristic of Gangou are a result of close contact with neighbouring minority languages. As noted by Feng & Stuart (1992), this is an interesting fact, since usually the opposite is true elsewhere in China, i.e. Chinese is normally the 'donor' language while the minority language is the 'recipient' when it comes to linguistic borrowing. In the case of Gangou, the language that has been most influential in terms of grammatical borrowing is Mangghuer, a Mongolic language which itself has "undergone extensive contact-induced change" (Slater 2003: 1). This situation can be compared with two other Sinitic varieties within the Amdo Sprachbund that are equally famous for their divergent grammatical structures: Wǔtún 五屯 (see Sandman 2016) and Tángwàng 唐汪 (see Xu 2017), the principal donor languages of these varieties being Amdo Tibetan (Bodic) and Salar (Turkic) respectively. It should be noted that many features in Gangou, Wutun, and Tangwang are areal rather than direct borrowings from a single donor language, and it may thus be difficult to determine the exact origin of a certain feature.

Unfortunately, there is no doubt that the use of Gangou is declining and there are no signs at present pointing to a change of this situation. Some younger people have said to me that they don't speak pure Gangou dialect and that only the older generation still speaks it. UNESCO lists Gangou as a severely endangered language[1].

1.2 Gangou Township

Gangou Township, *Gāngōu xiāng* 甘溝鄉, is one of 22 township-level administrative divisions of Minhe Hui and Tu Autonomous County 民和回族土族自治縣 (a.k.a. Minhe County), Qinghai Province, China. It is a vast, hilly area consisting of 13 small villages holding a population of around 12,000 people. The four largest ethnic groups are Hàn 漢族, Huí 回族, Tǔ 土族 and Tibetan (Zàng) 藏族, as shown in table 1. The data is from Feng & Stuart (1992: 2):

Ethnicity	Population	Percentage of Total
Hui	4,427	35.76
Han	3,545	28.58
Monguor (Tu)	2,777	22.43
Tibetan	1,631	13.17
Total	12,380	

Table 1. Population of Gangou Township in 1990

Below is a table showing the population of Gangou Township and some neighbouring towns and townships in Minhe County. Feng & Stuart (1992: 2) write: "To the south and southeast [of Gangou Township] are two Monguor townships [Zhongchuan and Guanting] and to the north is a township [Xinger] inhabited mostly by Tibetans who have retained their language and culture. Ten km to the west and northwest are several townships populated primarily by Islamic Hui." The data is from Zhao (2015):

[1] http://www.unesco.org/languages-atlas/index.php?hl=es&page=atlasmap&cc2=CN, retrieved 28.03.2019.

	Total	Han	Hui	Monguor	Tibetan	Others
Gangou	11,852	5,900	4,228	1,310	414	
Xinger	3,325	353		692	2,280	
Manping	13,754	7,895	5,757	95	4	
Qianhe	10,652	4,521	3,707	2,435		
Zhongchuan	15,161	158	3,523	11,445	18	17
Guanting	13,185	276	1,132	11,600		177

Table 2: Population of Minhe County in 2011

Taking a closer look at the sociolinguistic situation in Gangou Township, Mangghuer is the second most widely spoken language in the township, since some members of the Tu ethnic minority retain their native language. As for the Tibetans living in Gangou Township, most if not all have shifted to Gangou according to my informants. Hui and Han all speak Gangou as their first language. Despite sharing the same language with the other ethnic groups, the Muslim Hui people are less connected to the other groups, due to the fact that they do not participate in Buddhist and other cultural activities in the villages. Zhu et al. (1997) note that "many Gangou Monguor, Tibetans, and Han feel closely united", whereas the Hui are felt to have their own ways. This is also reflected in the fact that intermarriage between non-Hui is common, while Hui marry almost exclusively within their own ethnic group. This has led to, on the one hand, Gangou being the common language of all Gangou residents, and on the other, a distinction between the Gangou spoken by the Hui and the Gangou spoken by people of other ethnicities.

The isolation of Gangou Township through its history is still easily imaginable. At around 200 km from Xining, the provincial capital, this mountainous area has up until recently been relatively unaffected by outside influences, which has allowed the variety of Chinese spoken here to develop in its own, distinct way. However, increased mobility and the resulting increased contact with more prestigious varieties of Mandarin Chinese is likely to prove fatal to Gangou. In 2016, the Minhe–Guanting highway was built, reducing considerably the time it takes to get to Xining, the capital of Qinghai Province, or Lanzhou, the capital of Gansu Province. At the time of my visit in September 2017, Gangou Township still awaited a highway exit of its own, and it was required to take the exit to Manping Town to get there. The 11 km poorly maintained dirt road leading from Manping Town to Gangou Township gives an indication of the isolation this region has existed in, which will soon disappear.

Regarding the socioeconomic situation of Gangou, Feng & Stuart (1992: 2) note that most Gangou residents are nearly self-sufficient peasants. The situation seems to be changing, as more and more young people are moving to bigger cities, such as Xining, to study or work. Also, many people of the older generations go to Xining to work with private businesses, such as restaurants and hotels, some as full-time entrepreneurs, others engaging in part-time business to increase their income.

As for religion, except for the Muslim Hui population, most Gangou residents adhere to Tibetan Buddhism. The most important landmark of Gangou Township is the Buddhist Kadikawa temple, which has a history of more than 1,400 years, located in the centre of the township in Jingning village 靜寧村. "It was destroyed during the Cultural Revolution (1966-1976) and rebuilt in 1982" (Feng & Stuart 1992: 17). Legend has it that a local Tibetan official, who had been exiled to the present day Gangou area, met Tsongkhapa, the founder of the Gelug school of Tibetan Buddhism. He was instructed to bring a portrait of Tsongkhapa's mother to Gumbum Lamasery where she was living. The portrait, painted by Tsongkhapa with his own blood, had the ability to speak, and therefore the local Tibetan made a copy of it. He then brought the copy of the portrait to Gumbum and took the original to Kadikawa Temple, where it is kept still.

1.3 Language contact and the Amdo Sprachbund

Fairly early on, researchers of Sinitic languages in the Qinghai–Gansu border area noticed that the Chinese varieties spoken there shared some distinct features that were untypical of Sinitic. Studies on individual Chinese dialects and non-Sinitic elements found in them started to appear in the 1980s, but Dwyer (1995) was the first to use the term *Sprachbund* to describe the linguistic situation in the Qinghai–Gansu area, explicitly stating the presence of "idiosyncratic features" shared by several languages in the region (Dwyer 1995: 144). Slater (2003) termed it the Qinghai–Gansu Sprachbund. In Janhunen (2007), the term Amdo Sprachbund was suggested, and this is the term used in the present thesis. Xu (2015) treats what he calls the Hezhou area as "a smaller linguistic area inside the Qinghai–Gansu area", including "Linxia city, Linxia, Hezheng, Guanghe, and Yongjing counties in Gansu province, and Xunhua, Minhe, Ledu, Tongren, Datong and Datong counties in Qinghai province" (Xu 2015: 60). In fact, it is this microarea that Gangou belongs to.

Languages of the Amdo Sprachbund. Sinitic is one of the four linguistic stocks that form the Amdo Sprachbund, the other three being Bodic, Mongolic, and Turkic. The Sinitic languages

of Qinghai have been classified in the following way by the Chinese dialectologist Zhang Chengcai: 1) the Xīníng group, 2) the Lèdū group, and 3) the Xúnhuà group (Zhang 1984). Gangou is located geographically within the Ledu group. The classification is based on phonological features, but as already mentioned, syntactically and morphologically, Gangou is distinct from the other varieties within its group. Encompassing the whole Amdo Sprachbund (including the southern part of Gansu Province), Janhunen (2006) distinguished the following six Sinitic: Xīníng fāngyán 西寧方言, 2) Lánzhōu fāngyán 蘭州方言, 3) Hézhōu huà 河州話 /Línxià fāngyán 臨夏方言, 4) Tángwàng huà 唐汪話, 5) Gāngōu huà 甘溝話, and 6) Wǔtún huà 五屯話, of which the first three are commonly considered "regional dialects" and the latter three "local vernaculars" (Janhunen (2006: 261-262). The "vernaculars" (話) have evolved faster and are even more distinct than the more regional "dialects" (方言). Xu notes that "[i]n the north and northwest of China […] cities form a network which is different from their peripheral zones" (Xu 2015: 66).

In the example sentences below, some of the isoglosses that form the Amdo Sprachbund are shown; verb-final syntax, obligatory verb particles except in imperative phrases (example 2 contains the progressive marker and example 3 the perfective marker), and the object marker *-ha*. (Mangghuer also has the objective markers *bang* and *-jiang*, indicating speaker objectivity, a grammatical category that does not seem to be present in Gangou.) The example sentences are from Stuart & Feng (1992), who also include Tibetan[2]:

1.	Standard Chinese	你 吃 一 碗 飯。
		nǐ chī yì wǎn fàn
		2SG eat one CL.bowl rice
	Gangou	*ni fan yi wan chi*
		2SG rice one CL.bowl eat
	Mangghuer	*yama yi wan di*
		food one CL.bowl eat
	English	'You eat a bowl of food.' (suggestion)

[2] The glosses are based on the source but have been modified according to modern conventions. Standard Chinese is transcribed using *pinyin.* Gangou and Mangghuer examples have been modified to represent the orthographies used in this thesis and in Slater (2003) respectively.

2. Standard Chinese 他 正在 看 書。
tā *zhèngzài* *kàn* *shū*
3SG PROG read book

Gangou *ta* *shu* *kan-zhili* *a*
3SG book read-PROG PART

Mangghuer *gan* *shu* *ji-ser* *bang*
3SG book look-PROG OBJ:COP

English ‘S/he is reading a book.’

3. Standard Chinese 他 拉走了 車子。
tā *lā-zǒu-le* *chēzi*
3SG pull-go-PERF cart

Gangou *ta* *chezi-ha* *la-zeu-lio*
3SG cart-ACC pull-go-PERF

Mangghuer *gan* *tiaoerge-ni* *lake* *yao-jiang*
3SG cart-ACC pull go-OBJ:PERF

English ‘S/he drew the cart away.’

On the level of phonology, which is the topic of the present thesis, there are a few features that can be added to the group of non-Sinitic features in the Amdo Sprachbund. One is the phenomenon of vowel reduction, which in the present thesis refers to the shortening of the duration of a vowel, creating monomoraic syllables out of normally lengthened, bimoraic syllables, as described in section 4.1. This involves vowel devoicing when the vowel in question occurs after an aspirated initial, a fricative or an affricate, a phenomenon which has also been reported for Mangghuer (Slater 2003: 36–37). Another characteristic, which could also be regarded as a kind of vowel reduction, is the reduction of diphthongs to monophthongs, as described in section 3.4. A third characteristic of Gangou phonology is the reduction of tones which makes Gangou sound more intonational than tonal. On a typological scale, the other extreme is represented by Cantonese, which places roughly equal amounts of stress on all syllables (and where stress therefore plays a less obvious role), and which has no toneless syllables. Xu makes the interesting observation that city-based varieties of Chinese in the Amdo Sprachbund are more tonal than peripheral varieties, and that tone reduction in Northwest China has occurred to a larger extent in areas surrounding cities than in the cities themselves (Xu 2015).

When it comes to the phonemic inventory, on the other hand, Gangou is remarkably Sinitic, just like many of the other Sinitic languages of the Amdo Sprachbund, Wutun being one exception containing some Tibetan features as well (Sandman 2016: 19). Also, the lexicon of Gangou and the other Amdo Chinese varieties remains largely Chinese; it is in the grammar that most changes have taken place from the Sinitic point of view.

History of the Amdo Sprachbund. According to Janhunen (2012: 177), "[t]he historical depth of the Amdo Sprachbund in its current form may be estimated to be in the range of 500 to 1500 years." As for the Sinitic varieties in the Amdo Sprachbund, Dede (2003) suggests that they may have started to form in the Ming era which started ca. 650 years ago.

As explained in detail in Dede (2003), contact between Chinese-speaking Han and non-Han groups in the Qinghai–Gansu area is thought to have taken place already during the Han dynasty around the beginning of the Common Era. Since that time, Han Chinese governments were trying to establish control in Qinghai, which was the border between the Han and non-Han peoples to the west. Groups of soldiers were sent to the area to prevent foreign peoples such as the Qiang and the Tibetans from progressing into Han territory, and these soldiers had to sustain themselves by farming. It was not until the Ming dynasty (1368–1644), after a period of Jurchen (the Jin dynasty 1115–1234) and Mongol (the Yuan dynasty 1206–1368) rule over the area, that these military attempts were successful, leading to the integration of Qinghai into the Ming Chinese Empire. It was through these "military-agrarian colonies" in different parts of Qinghai that the development of distinct Qinghai Chinese varieties such as Gangou started developing. However, before the Ming dynasty, the colonisations were temporary, and as central rule weakened, the Chinese-speaking soldiers that had been dispatched to the area were either killed or integrated with the native culture. We can therefore conclude that the varieties of Chinese spoken in Qinghai today, including Gangou, descend from the language spoken by the Ming-era settlers. (Dede 2003: 322–329)

To summarize, the non-Sinitic features of Gangou are a result of linguistic contact and cultural intermingling that started during the early Ming era. Language contact has led to grammatical restructuring and, to some extent, phonological changes creating a pool of features now considered to form a common Amdo prototype. The fact that Gangou and other Sinitic languages of the Amdo Sprachbund have retained much of their Sinitic vocabulary might have contributed to the fact that the phonology has remained Sinitic in many respects and that it has changed to a much lesser extent than the grammar.

1.4 Previous research

Gangou has for a long time been quite unknown among researchers. However, there have been some publications on different parts of the Gangou grammar in recent years, most of them written in Chinese. The earliest account in English of the Gangou people and their speech to my knowledge is Lide Feng's and Kevin Stuart's article from 1992. The first study dealing specifically with the Gangou language is Zhu et al. (1997), which for a long time was the only written account of Gangou from a linguistic point of view. In 2013, Yáng Yǒnglóng 楊永龍 published the first Chinese-language article on the subject. He has subsequently published some articles that cover several areas of Gangou grammar, including the case system, plural marker and word order. His student Zhào Lǚyuán 趙綠原 wrote his master's thesis on the Gangou verbal morphemes in 2015. The phonology of Gangou has so far not been examined.

1.5 The transcription system used in the present thesis

Before going to the phonological analysis, a few words should be mentioned about the transcription system used in the present thesis. In previous studies of Gangou, the transcription systems used have been either *pinyin*, the transcription system based on Standard Chinese, or a combination of Chinese characters and IPA. Since neither *pinyin* nor Chinese characters represent the phonemic system and the phonetic values of Gangou phonemes in a satisfactory way, it has been considered necessary in this thesis to create a romanization that is more well-suited to the sounds of Gangou. One alternative would be to represent Gangou phonetically using IPA alone, but the obvious drawback of this is the lack of phonemic economy in such a transcription. Furthermore, it is easy to construct a transcription based on *pinyin*, since only a few changes need to be made. The motivations for the changes have been economy (deletion of redundant graphs) on the one hand, and accordance with Gangou pronunciation on the other. See Appendix for an overview of the transcription system used. Many readers will be familiar with *pinyin*, and a summary of the differences between *pinyin* and the present transcription system is therefore given table 3.

Pinyin	Gangou	Example
-ü	*-y*	女 *ny*
-ong	*-ung*	從 *cung*
-ou	*-eu*	頭 *teu*
-(i)ao, -iao	*-(i)o*	到 *do*，了 *lio*
xi-, ji-, qi-	*x-, j-, q-*	叫 *jo,* 酒 *jeu*
-iu	*-iu/-eu*	六 *liu,* 袖 *xeu*

Table 3: Comparison between pinyin *and Gangou.*

As shown in the above table, *ü* has been replaced by *y*, because it is felt that diacritics are better left out if possible. *ong* is changed to *ung* because the latter better represents the pronunciation [ũ] of this trigraph based on IPA. The change of *-ou* to *-eu* is due to the pronunciation [ɯ], which differs significantly from the corresponding Standard Mandarin final written *-ou* in *pinyin.* Note that the name Gangou itself is pronounced [kæ̃ŋ.kɯ]. However, since the *pinyin* spelling of the language has become established in the literature, it is written as Gangou rather than Gangeu also in the present thesis. The reason for the change from *-ao* to *-o* is that it better reflects the pronunciation [ɔu̯], which is different from the corresponding Standard Mandarin final [au̯]. Lastly, a redundancy of the *pinyin* system that has been deleted in the present orthography is the addition of the graph *i* after the graphs *x, j,* and *q*, representing alveolo-palatal initials. Since the palatal medial is inherent in these initials, the *i* can be left out in the orthography, which gives *jo* instead of *jio* (Standard Mandarin *jiao*), *qe* instead of *qie* etcetera. The orthographic sequence *-iu* is chosen instead of *-ieu* when following any other initial than the alveolo-palatals.

Throughout this thesis, orthographic syllables are written using cursive letters, underlying representations are given within slashes, and surface pronunciations within square brackets. Middle Chinese pronunciations are based on Chan (2006). *Pinyin* is used to represent Standard Mandarin pronunciations. The four tones of Standard mandarin are written using the following diacritics (exemplified by the vowel *a*): *ā* (tone 1), *á* (tone 2), *ǎ* (tone 3), and *à* (tone 4).

2 Theoretical concepts and method

The purpose of this section is to explain the theoretical concepts that are used in the present thesis and to show the way in which these have been combined to form the method for analysing the phonology of Gangou. Section 2.2 is a brief explanation of the data elicitation process.

2.1 Theoretical concepts

Section 2.1 is a description of the theoretical concepts used in the present thesis. Section 2.1.1 discusses the syllable structure of Gangou based on the conventions of traditional and modern Sinitic phonology. Section 2.1.2 is an explanation of the underlying representations used throughout the thesis. In section 2.1.3, the representation of suprasegmental features, i.e. tones and morae, is described.

2.1.1 Syllable structure

Traditional analysis of the Chinese syllable. Phonological studies of the Chinese language go back as far as the early centuries of the common era. The famous *Qièyùn* 切韻 published in 601 CE is the first extant dictionary that classifies Chinese syllables according to the *fǎnqiè* 反切 principle, entailing a phonological classification of syllables in terms of initials and finals. Later on, the so-called rhyme tables (*yùnjìng* 韻鏡) were created for the purpose of guiding the correct pronunciation of Chinese syllables, and these are the most detailed historical sources available on Late Middle Chinese (the form of Chinese described, or perhaps prescribed). In the rhyme tables, initials and rhymes can be deduced based on the *fanqie* principle while glides are thought to be related to the notions of *hékǒu* 合口 (closed mouth, i.e. syllables containing a labiovelar glide) and *kāikǒu* 開口 (open mouth, no labiovelar glide) as well as, to some extent, the four *grades*, which are thought to be related to the palatalization or the vocalism of the nuclear vowel. (Chan 2006)

In modern Chinese phonology, represented by scholars such as Bernhard Karlgren and Chao Yuanren, syllables are divided into an initial and a final, the latter of which is further divided into medials and rhymes, according to the following hierarchical structure (see, for example, Chao 1968: 18–35):

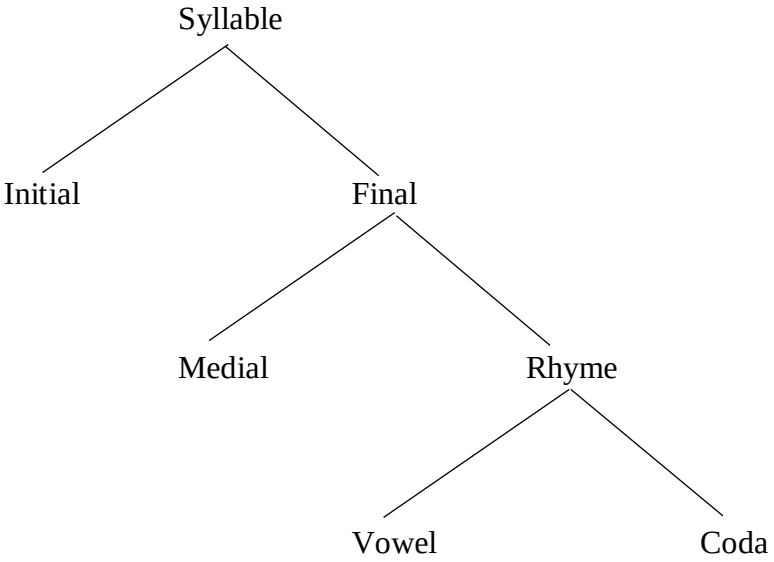

Figure 1: Traditional analysis of a Chinese syllable.

The Initial refers to nasals, stops, affricates, fricatives, and liquids at the syllable onset, excluding any simultaneous labialization or palatalization of the consonant. Coarticulations such as these fall under the Medial node. The Medial is referred to as a medial glide in the present thesis, and can be either a palatal, labiovelar or a palatolabial glide. According to the above figure, the medial groups together with the final rather than the initial. The question of the position of the medial, under the Final node or under a separate node together with the initial, has been subject to some debate. I follow Duanmu (2000) in grouping the medial together with the initial, for reasons explained below. In the present thesis, therefore, the syllable structure is analysed in the following way:

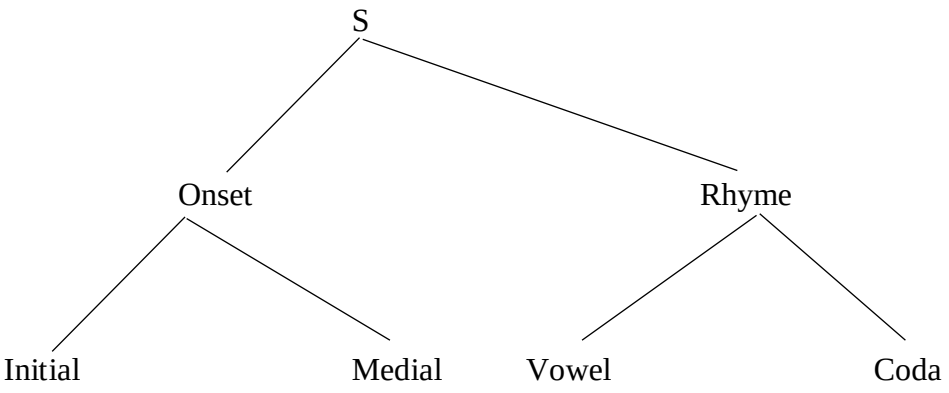

Figure 2: Syllable structure according to Duanmu (2000).

Figure 2 represents the four positions which form the underlying skeleton upon which all Gangou syllables are based. In this analysis, the medial glide is on the same node as the initial,

and the coda on the same node as the nuclear vowel. It is later explained that both of these facts are motivated by phonetic factors.

Below is a table showing some possible syllable types in Gangou:

Initial	Medial	Vowel	Coda	Underlying representation	Example
s				/s/	*si* 四 [sz̩], ‘four’
l	i			/li/	*li* 哩 [lz̩], *irrealis marker*
l		a		/la/	*la* 辣 [la], ‘hot, spicy’
l	i	a		/lia/	*lia* 倆 [lʲa], *dualis marker*
l		a	n	/lian/	*lan* 藍 [læ̃], ‘blue’
l		a	i	/lai/	*lai* 來 [lɛ], ‘to come’
l	i	a	n	/lian/	*lian* 臉 [lʲæ̃], ‘face’
	i			/i/	*yi* 一 [z̩], ‘one’
	i	a		/ja/	*ya* 鴨 [ja], ‘duck’
	i	a	n	/jan/	*yan* 鹽 [jæ̃], ‘salt’
		a		/a/	*a* 啊 [a], *final particle*
		a	n	/an/	*an* 安 [æ̃], ‘safe’

Table 4: Possible syllables in Gangou.

2.1.2 Underlying representations

Underlying representations are used throughout this thesis to reflect some diachronic changes that have taken place in Gangou and to explain some phonological rules that are not motivated by phonetic factors.

As shown in figure 2 in section 2.1.1, the Onset node is divided into an Initial and a Medial node, and the Rhyme node is divided into a Vowel and a Coda (a.k.a. Final) node. Next, the four positions are discussed in turn.

The Initial position can be empty, as in syllables such as *an* /an/, which consists of a nuclear vowel and a final nasal only, or *yan* /jan/, which has a medial glide, a nuclear vowel and a final nasal, or it can contain an initial consonant. There is one case in which the initial can be the only underlying element of a syllable. This is the case in the syllables *si* /s/, *zi* /ts/, and *ci* /tsh/. According to the present analysis, these syllables are underlyingly vowelless and, as a consequence, the initial is syllabified, as in the following examples:

(1) *si* 四 /s/ [sɻ], 'four'

zi 字 /ts/ [t͡sɻ], '(Chinese) character'

ci 次 /tsh/ [t͡sʰɻ], 'time, occasion'

As for the underlying representation of the initials, I use the IPA symbol that most closely reflects the initial in question in most cases. For example, the labials are written as *b* and *p* in the orthography (following *pinyin*), but as /p/ and /ph/ underlyingly (I use /-h/ for aspiration). Similarly, the velars are underlyingly /k/ and /kh/, and the dentals /t/ and /th/. For the alveolars, I use /ts/ as the underlying representation of the affricate [t͡s] (instead of /z/ as in the orthography), and /tsh/ for its aspirated counterpart. The retroflex initials are represented underlyingly as /sr/ (*sh*), /tsr/ (*zh*), and /tsrh/ (*ch*). The alveolopalatals are analysed as underlyingly /si/, /tsi/ and /tshi/, in other words, they are alveolars combined with the palatal medial glide. See Appendix for an overview of the underlying representations.

The Medial position is occupied by medial glides (a.k.a. medials), of which there are three: /i/, /u/, and /y/. When there is an initial present in the syllable, the medial glides can surface as phonetically distinguishable elements, or they can be integrated with the initial. For example, /u/ can always be distinguished phonetically; it is realized as [w]. /i/ normally surfaces as a separate element, as [j], except in the case of the palatoalveolar initials *x* /si/, *j* /tsi/, and *q* /tshi/, which contain an integrated /i/. /y/ represents the sequence /iu/. In (2), the first two examples show words in which the medial surfaces as a phonetically distinguishable element, while the last two shows words in which the medial is integrated with the initial.

(2) *hua* 花 /xua/ [xʷa], 'flower'

lia 倆 /lia/ [lʲa], *dual marker*

jia 家 /tsie/ [t͡ɕa], ‘house’

qa 錢 /tshia/ [t͡ɕʰa], ‘money’

The medials can be the only segments present in a syllable or they can combine with vowels without a preceding initial consonant, as in *ye* /ie/ 也 ‘also’, *wawa* /uaua/ ‘child, boy’. Below are four examples showing the medials when occurring as the single underlying element of a syllable:

(3) *yi* /i/ [ʐ̩], ‘one’

wu /u/ [ʋ̩], ‘five’

yu /y/ [ʐ̩ʷ], ‘fish’

They can also combine with only an initial and function as the syllabifying element of a syllable, as in *li* 力 /li/ [lʐ̩], ‘strength’, *lu* 路 /lu/ [lʋ̩], ‘road’, *ly* 旅 /ly/ [lʐ̩ʷ], ‘journey, travel’. See section 3.3 for e detailed description of the medial glides, and section 3.4.7 for a description of medial glides as syllabifying elements (fricative vowels).

The Vowel position is occupied by a nuclear vowel. The term nuclear vowel is used here to distinguish the nuclear vowels from the fricative vowels, which, as explained above, are syllabified medial glides, and from combined vowels, which are explained below. According to the present analysis, Gangou has only two nuclear vowels on the underlying level: /a/ and /e/. These are combined with the final glides /-i/ and /-u/ to form a set of six vowels (excluding the three fricative vowels) described in sections 3.4.1 through 3.4.6. The plain vowels /a/ and /e/ do, of course, also appear as such without any final element, or as the only element of a syllable:

(4) *a* 啊 /a/ [a], *final particle*

e 餓 /e/ [ə], ‘hungry’[3]

cha 茶 /tsrha/ [t͡ʂʰa], ‘tea’

che 車 /tsrhe/ [t͡ʂʰə], ‘car, vehicle’

[3] This is the formal pronunciation of this syllable. The more common pronunciation is [nʷə].

The other four combined vowels are analysed as containing one of the nuclear vowels /a/ or /e/ and one of the final glides /-i/ or /-u/:

(5) /a/ + /-i/ = /ai/, as in *lai* 來 [lɛ], 'to come'

/a/ + /-u/ = /au/, as in *lo* 老 [lɔu̯], 'old'

/e/ + /-i/ = /ei/, as in *lei* 累 [li], 'tired'

/e/ + /-u/ = /eu/, as in *leu* 樓 [lɯ], 'building'

The Coda (or Final) can be further divided into nasal finals and final glides. There is also a rhotic suffix, which behaves somewhat differently than the other two kinds of finals (see section 3.5.3). The Final position can be empty, but finals cannot stand alone to form a syllable, while (alveolar) initials, medial glides and nuclear vowels can.

As the name suggests, final glides are glides occurring in final (i.e. coda) position, as opposed to medial glides, which occur in medial position. Final glides are coarticulated with the nuclear vowels /a/ and /e/ to form the combined vowels, as described above.

There is a principle in Gangou, according to which a syllable cannot contain two glides of the same type in medial and final position in the same syllable. In other words, there cannot be both a medial /i/ and a final /i/, or a medial /u/ and a final /u/, in the same syllable. Hypothetical examples such as the following, although phonetically quite possible, are therefore not found:

(6) **liai* /liai/ [lʲɛ]

**jai* /tsiai/ [t͡ɕɛ]

**tueu* /thueu/ [tʰʷɯ]

**duo*[4] /tuau/ [tʷɔu̯]

Syllables containing two glides of different types, on the other hand, are readily found in the vocabulary.

(7) *lio* 了 /liau/ [lʲɔu̯], *perfective marker*

[4] *Pinyin* syllables such as *duo* and *wo* are analysed as /twe/ and /we/, and written as *due* and *we*, in Gangou.

jiu 九 /tsieu/ [t͡ɕɯ], ‘nine’

kuai 快 /khuai/ [kʰʷɛ], ‘fast, quick’

dui 對 /tuei/ [tʷi], ‘yes; correct’

Apart from final glides, Gangou also has final nasals and a rhotic suffix occurring in final position. As shown in section 3.5.2, final nasals surface as a nasalization of the previous vowel. For this reason, the final nasals could be represented underlyingly as /-N/. There are, however, contexts in which the two nasals *-n* and *-ng* have different surface realizations, for example when combined with the nuclear vowel *a*, and they are therefore distinguished underlyingly when necessary. Where the contrast is not relevant, such as in the fabricated examples in (8) below, nasal finals are represented as /-N/.

Finals of two different kinds cannot be combined, and so, for example, there cannot be both a nasal final and a final glide in the same syllable. Therefore, we do not find syllables such as the following:

(8) **lain* /laiN/ [lɛ̃]

**leing* /leiN/ [lĩ][5]

**long*[6] /lauN/ [lɔ̃u̯]

**leun* /leuN/ [lʉ̃]

The rhotic final is analysed as a rhotic suffix /-er/. As evident in (9), the original vowel of the syllable along with any final elements (final glides and final nasals) are deleted and replaced by the rhotic suffix /-er/ when it is attached to a syllable. See section 3.3.4 for a more detailed description.

(9) *zher* /tsrer/ [t͡ʂəˠ], ‘here’

zhungr /tsruer/ [t͡ʂʷəˠ], ‘cup’

[5] The pronunciation [lĩ] exists in Gangou, but it is derived from the underlying sequence /liN/, not /leiN/.
[6] *Pinyin* syllables such as *long* and *zhong* are analysed as /lwN/ and written as *lung* and *zhung* in Gangou.

2.1.3 Suprasegmental representations

Tones are represented using the system of "tone letters" developed by the Chinese linguist Chao Yuen-Ren as laid out in his 1930 article (Chao 1930). The so-called tone letters are in fact vertical staffs combined with horizontally oriented lines showing the contour of the tone in question, and this has become the standard way of denoting tone in IPA. The contour lines are often transcribed into digits. In Chao's system, five levels of pitch are distinguished, [˩] or 1, denoting the lowest point of the pitch range, and [˥] or 5, denoting the highest point of the pitch range. The system is not without its problems, especially since it is neither completely phonological nor completely phonetic. For example, if a language has a mid-level tone 33 with the allotonic variant 32 (slightly falling) in utterance-final position, an author might transcribe it as 32 word-finally and as 33 elsewhere, even though the fall is non-tonemic, i.e. there is no non-falling mid-tone that contrasts with the slightly falling mid-tone. See, for example, Duanmu (2000: 210–213) and Yip (2002: 21–35) for some further problems.

In the present thesis, tonal transcriptions are used phonologically. For example, the Gangou high tone is transcribed consistently as /55/, even though it has the allotonic variant /51/ in some of the examples. (I could use upper-case H, for example, to denote the high tone, and upper-case L for the low tone etcetera, but I have opted for numerical values for clarity.) The staff system is used in IPA transcriptions (within square brackets); tonal digits are used in underlying representations (within slashes) while upper-case tonal digits are used the orthographic transcription, as in: *gan*^{11} *geu*^{35} /kan11 keu35/ [kæ̃˩.kɯ˦˥], 'Gangou'. Tones are marked only in section 4.

Mora. Gangou syllables can be analysed in terms of morae. A mora is, in Peter Ladefoged's words, "a unit of timing", and "[e]ach mora takes about the same length of time to say" (Ladefoged 2006: 355). A normal, full Gangou syllable is composed of two morae, while a reduced syllable (a syllable containing a reduced vowel) consists of one mora. Full, bimoraic syllables are transcribed using two tonal digits while monomoraic syllables have one tonal digit only. For example, in the words *fu*^{5} *ye*^{11} *zi*^{5} 樹葉子, 'tree leaves' and *xi*^{1} *hung*^{24} *shi*^{5} 西紅柿, 'tomato', the first and the last syllables are monomoraic while the syllables *ye*^{11} and *hung*^{24} are bimoraic. It should be noted that there is no length distinction in Gangou vowels, as in Japanese for example, i.e. the contrast between monomoraic and bimoraic syllables is non-contrastive. See section 4.1 for a more detailed description.

Underlying tone. Underlying tone is the expected tone value of a syllable, i.e. the tone value it has before any phonological rules are applied so that, for example, the syllable becomes toneless or the tone of the syllable becomes neutralized. For example, the underlying tone of the syllable *yu*[35] 語, 'language', is taken to be /11/. In word-initial position, it surfaces with its expected value, as in *yuyan* 語言 /y11 ian35/, but utterance-finally, it surfaces as /35/, as in *tuyu* 土語 /thu11 y35/ 'Monguor language'.

2.2 Method

The material used in the present thesis was collected during my one-month stay in Gangou and Xining in September 2017. It consists of interviews with native speakers of Gangou: one female speaker of Tu ethnicity and two male speakers of Han ethnicity[7]. During the sessions, the speakers were asked to pronounce words that were written down, give the Gangou equivalent of Standard Chinese words, and translate short sentences that were first given in Standard Mandarin. The material was recorded using a digital recorder with a built-in microphone and then segmented and annotated using ELAN.

3 Segmental phonology

In this section, the phonemes of Gangou are described. The syllable is the minimum unit examined in this section; word-level phonology is the topic of section 4. As described above, the Gangou syllable structure is C M V F, where C refers to initial consonants, M to medial glides, V to nuclear vowels, and F to final elements pertaining to the syllable coda. A Gangou syllable can minimally constitute of a single initial consonant (alveolar /s, ts, tsh/), a single medial glide (/i, u, y/) or a single nuclear vowel (/a, e/), and maximally of four different elements (e.g. *lian* /lian/, *huar* /huar/). In the rest of this section, these four positions of the syllable are examined in turn.

[7] In descriptions of Sinitic languages of the Amdo Sprachbund, Hui speakers are often mentioned as having a different pronunciation and using different words compared to other ethnic groups. For example, in Tangwang, Hui speakers don't distinguish tones in monosyllabic words while Han speakers do (Xu 2017: 66-69). To the question whether it is possible to see who is Hui and who is not, one of my consultants said that if one cannot see the difference, one can definitely hear it when they speak. Unfortunately, no Hui speaker was interviewed for this thesis, and it should be borne in mind that the Gangou of Hui speakers is likely to differ significantly on some points compared to the results of the present study.

3.1 Initials

Gangou has 21 consonant phonemes. The Gangou initials are given in the table below. Orthographic representations are written in cursive and IPA values within square brackets.

	Labial	Labio-dental	Alveo-lar	Retro-flex	Palatal	Labio-palatal	Velar
Stop	*p* [pʰ]		*t* tʰ]				*k* [kʰ]
	b [p]		*d* [t]				*g* [k]
Affricate			*c* [t͡sʰ]	*ch* [t͡ʂʰ]			
			z [t͡s]	*zh* [t͡ʂ]			
Fricative		*f* [f]	*s* [s]	*sh* [ʂ]			*h* [x]
Nasal	*m* [m]		*n* [n]				
Approxi-mant		*w* [ʊ]			*y* [j~ʑ]	*yu* [jʷ~ʑʷ]	
Liquid			*l* [l]	*r* [ɻ]			

Table 5: Gangou initials.

Besides the retroflex and alveolar fricatives and affricates, Gangou has three alveolo-palatal initials, *x* [ɕ], *j* [t͡ɕ] and *q* [t͡ɕʰ], which are in complementary distribution with the alveolars *s, z* and *c*, as explained below. The approximants and the retroflex liquid are analysed as medial glides functioning as initial elements in the absence of another initial consonant. The labiovelar approximant [ʊ] is the only initial that is slightly different from its equivalent in Standard Chinese, which has a labiovelar approximant [w].

3.2.1 Stops

Gangou has three pairs of stop consonants, each consisting of one unaspirated and one aspirated variant. Voiced stops are not distinguished phonologically in Gangou. I follow the *pinyin* system by using *b, d, g* to transcribe unvoiced stops and *p, t, k* to transcribe aspirated initials.

	Labials		Dentals		Velars	
Unaspirated	*bang* 幫	[pɑ̃]	*da* 大	[ta]	*gu* 骨	[kʊ̣]
Aspirated	*pang* 胖	[pʰɑ̃]	*ta* 他	[tʰa]	*ku* 哭	[kʰʊ̣]

Table 6: Gangou stop consonants.

3.2.1.1 Velar stops

The velar stops *g* [k] and *k* [kʰ] occur with all vowels except /i/ and /y/. They are identical to the velar stops in Standard Mandarin.

(10) *ga* 尕 [ka], 'small'

gangeu 甘溝 [kæ̃ŋ.kɯ], 'Gangou'

kang [kʰɑ̃], 'thirsty; heatable brick bed'

renkeu 人口 [ɻĩŋ.kʰɯ], 'number of people'

The velar stops do not combine with the palatal medial glides /i/ or /y/ in the modern language. Diachronically, due to palatalization, velar stops changed from velars to alveolo-palatals in most Mandarin varieties in this environment. For example, the initial of the word 見 *jian*, which represents the velar initial /k/ in Middle Chinese, is an alveolo-palatal affricate [t͡ɕ] in Standard Mandarin and Gangou. This development is common to most Mandarin varieties.

The palatalization of velars can be summarized as follows:

(11) k / _i → t͡ɕ

kʰ / _i → t͡ɕʰ

As mentioned in section 2, also alveolar initials surface as alveolo-palatals when combined with medial /i/, and an alveolo-palatal initial thus has two possible historical origins. Since it is impossible to determine the origin of a certain alveolo-palatal synchronically, all alveolo-palatals are here analysed as underlyingly dental affricates plus /j/, although a separation of velars from

dental affricates would be more correct from a historical point of view. For example, the syllables 京 *jing* and 精 *jing*, having the initials /k/ and /ts/ respectively in Late Middle Chinese, belong to the phoneme /ts/ in Gangou.

(12) *jing* 京 /tsiN/ (LMC: /kẽj/) → [tɛĩ]

jing 精 /tsiN/ (LMC: /tsẽj/) → [tɛĩ]

Since the velars do not combine with the palatal medial /i/, it naturally follows that they do not combine with the palato-labial /y/ medial (which is the same as /iu/) either. On the other hand, velars commonly occur with the labiovelar medial.

(13) *yigua* [ʐ̩.kʷa], 'all'

gui 貴 [kʷi], 'deer, expensive'

guai 怪 [kʷɛ], 'strange'

shuigue 水果 [ʂʷi.kʷə], 'fruit'

3.2.1.2 Dental stops

The dental stops *d* [t] and *t* [tʰ] occur in front of all vowels except /y/ and are identical to their equivalents in Standard Mandarin.

(14) *dozi* 刀子 [tɔu̯.tsʐ̩], 'knife'

dadana [ta.ta.na], 'butterfly'

tungcheng 通常 [tʰũŋ.t͡ʂʰĩ], 'usually'

shiteu 石頭 [ʂʐ̩.tʰɯ], 'stone'

The dental initials combine with the palatal and labiovelar glides, but not the palato-labial glide /y/. Syllables such as **ty* or **dye* etcetera, are therefore not found.

(15) *diu* 丢 [tʲɯ], 'to lose, mislay'

dio 掉 [tʲɔu̯], 'to throw'; *verbal particle*

duan 短 [tʷæ̃], ‘short’

dui 對 [tʷi], ‘yes; to be correct’

The dental stops tend to undergo spirantization when occurring with the palatal medial /i/. The tendency is not as strong for the unaspirated dental *d* as for the aspirated dental *t*. The syllables *di* and *ding* tend to merge with *zi* and *jing*, while the syllables *ti, tie, tio, ting* and *tian* tend to merge with *ci, qe, qo, qing* and *qan* respectively (see section 3.2.2 on the pronunciation of affricates).

(16) *didai* 地帶 [t͡sʐ̩.tɛ], ‘zone, belt’

dingzi 釘子 [t͡ɕĩŋ~tʲĩŋ.t͡sʐ̩], ‘nail, spike’

titian 梯田 [t͡ʂ̩ʰ.tʰʲɛ̃~t͡ɕʰɛ̃], ‘terraced (rice) field’

The pronunciations vary somewhat, and therefore syllables such as *tian* and *qian* are here kept distinct. The merging of *ti* /thi/ and *q* /tshi/ in the syllable *tian* has also been described for Tangwang (Xu 2017: 51).

The labiovelar medial /u/ tends to become voiceless as well, when following the aspirated dental, whereby the velar element becomes an unvoiced velar fricative [x]. The feature [+round] of the labiovelar medial tends to be dropped or realized very slightly when the nuclear vowel is *ei* (note that *tui* in the example below is underlyingly /thuei/). The tendency for aspirated initial stops to become “spirantized” is also reported for Xunhua Chinese (Dwyer 1995: 149).

(17) *tui* 腿 [tˣʷi~tˣi], ‘leg’

3.2.1.3 Labial stops

The labial stops *b* [p] and *p* [pʰ] are identical to their equivalents in Standard Mandarin. They occur in front of all vowels but are rare with *eu*.

(18) *bisai* 比賽 [pʐ̩.sɛ], ‘competition’

chabei 茶杯 [t͡ʂʰa.pi], ‘(tea) cup’

po 跑 [pʰɔu̯], ‘run’

yepa [jepʰa], ‘tail’

The labials occur readily with the palatal medial but not with the labiovelar or the palato-labial medial. Below are some examples where the labials are combined with the palatal medial.

(19) *bio* [pʲɔu̯], ‘don’t’ SM: 不要 *buyao*

bian 變 [pʲɛ̃], ‘to change’

pian 片 [pʃæ], ‘piece’

pioliang 漂亮 [pʃɔu̯.lʲɑ̃], ‘beautiful’

The only case in which the labials occur with the labiovelar glide is when the glide is the final element of that syllable, as in the words *pubu* and *mabu* below, which are analysed as /phu.bu/ and /ma.bu/ respectively (see section 2.1.2).

(20) *pubu* 瀑布 [pᶲʊ.pʊ], ‘waterfall’

mabu 抹布 [ma.pʊ], ‘rag, dust cloth’

The syllables *bue* and *pue* are allophonic variants of *be* and *pe*. In other words, the labiovelar glide after the labial stops is non-distinctive.

(21) *bueleiga* [pʷə.li.ka], ‘knee’

pue 破 [pˣʷə~pˣə], ‘break’

As with the aspirated dental, the medial glides become an unvoiced fricative when combined with the aspirated labial, as can be seen in the above examples. The phenomenon also exists in Xunhua, as reported by Dwyer, who suggests that it might be an influence from Bodic (Dwyer 1995: 149).

Two examples have been found where Standard Mandarin has the initial *b* /p/ and Gangou has *p* /ph/: *yepa* [jepʰa], ‘tail’, cf. Standard Mandarin *wěiba* 尾巴 and *luepu* [lʷə.pʰʊ], ‘radish’, cf.

Standard Mandarin *luóbo* 蘿蔔. Wutun also has an aspirated initial in some words in which Standard Mandarin has an unaspirated initial (Sandman 2016: 24). E.g. *pe* [pʰə], 'thin', cf. Standard Mandarin *bó*, Gangou *bue* [bʷə].

3.2.2 Affricates

Gangou has six affricates. Like the stops, each affricate is divided into an unaspirated and an aspirated variant. The affricates are furthermore divided based on their point of articulation into dental, alveolo-palatal and retroflex affricates.

	Dental	Alveolo-palatal	Retroflex
Unaspirated	*zai* 在[t͡sɛ] 'be at'	*jia* 家[tɕa] 'home'	*zhu* 豬[tʂʮ] 'pig'
Aspirated	*cai* 才 [t͡sʰɛ] 'only then'	*qia* [tɕʰa] 'money'	*chu* 出[tʂʰʮ] 'exit'

Table 7: Gangou affricates.

3.2.2.1 Alveolar affricates

The alveolar affricates occur with all vowels but are rare with *ei*. They are pronounced the same way as in Standard Mandarin.

(22) *zeu* 走 [t͡sɯ], 'go'

zhungzer 種子兒 [t͡ʂũŋ.t͡səˑ], 'seed'

cai 菜 [tsʰɛ] 'food; vegetable'

yuncai 雲彩 [jỹn.t͡sʰɛ], 'cloud'

As described in section 2, alveolars can occur as the single element in a syllable underlyingly. I follow the *pinyin* system by writing these syllables as *zi* and *ci*, underlyingly /ts/ and /tsh/, but it should be noted that the *-i* is not a syllabified medial like in syllables such as *ji* /tsi/. When an alveolar affricate occurs with the palatal medial, it becomes an alveolo-palatal affricate.

Alveolar affricates do not occur with the palatolabial glide /y/, but they do occur with the labiovelar glide /u/, albeit rarely.

(23) *zui* 最 [t͡sʷi], *prefix marking superlative*

gungzue 工作 [kũŋ.t͡so], ‘job, work’

3.2.2.2 Alveolo-palatal affricates

The alveolo-palatal affricates *j* [t͡ɕ] and *q* [t͡ɕʰ] are analysed as alveolar affricates with an inherent medial glide /i/: /tsi/ and /tshi/. For this reason, they are in complementary distribution with the alveolar affricates and do not constitute a phoneme of their own. Due to the inherent palatal glide, the alveolo-palatal affricates do not occur with *ai* /ai/ and *ei* /ei/, which contain a final palatal glide. See section 3.3.1 for a more detailed explanation.

(24) *jer* 鶏兒 [tɕəˇ], ‘chicken’

xangjo 香蕉 [ɕɑ̃.t͡ɕɔu̯], ‘banana’

maqor 麻雀 [ma.tɕʰɔˇ], ‘bird’

qi-li 去哩 [t͡ɕʲʰ.lz̩], ‘will go’

When the labiovelar glide /u/ is combined with an alveolo-palatal initial, the inherent /i/ of the initial combines with /u/ to form the medial /y/, so that *ju* is underlyingly /tsiu/, which is the same as /tsy/. Below are two examples where an alveolo-palatal initial is followed by /u/:

(25) *juzi* 橘子 [t͡ɕʑʷ.t͡sʐ̩], ‘tangerine’

quanbu 全部 [t͡ɕʰʷæ̃.pʊ̩], ‘whole, all of it’

3.2.2.3 Retroflex affricates

The retroflex affricates occur with all vowels but are rare with *ei*. They are pronounced the same way as in Standard Mandarin.

(26) *zhuzhu* 蛛蛛 [tʂʊ̩.tʂʊ̩], ‘spider’

zha 炸 [tʂa], ‘to deep-fry’

cha 茶 [tʂʰa], ‘tea’

yachi 牙齒 [ja.t͡ʂʰʐ̩], ‘tooth’

The retroflex affricates do not occur with the medial palatal glide /i/ or the palao-labial glide /y/. Therefore, we do not find syllables such as **zhie, *zhy* etcetera. The retroflex affricates are frequently combined with the labiovelar medial, as in the following examples:

(27) *zhuazi* 爪子 [t͡ʂʷa.t͡sʐ̩], ‘claw’

zhuangjia 莊稼 [t͡ʂʷɑ̃ŋ.t͡ɕa], ‘crops’

chuangzi 窗子 [t͡ʂʰʷɑ̃ŋ.t͡sʐ̩], ‘window’

chuiqi 吹氣 [t͡ʂʰʷi.t͡ɕʐ̩], ‘to blow’

3.2.3 Fricatives

Gangou has two kinds of fricatives: the sibilant fricatives *s, x,* and *sh* and the two non-sibilant fricatives *f* and *h*.

3.2.3.1 Sibilants

The alveolar sibilant. The alveolar sibilant *s* [s] occurs with all vowels except *ei*.

(28) *sa* 撒 [sa], ‘spread, sprinkle’

yanse 顏色 [jæ̃.sə], ‘colour’

gansan [kæ̃.sæ̃], ‘beautiful, handsome’

sung 送 [sũ], ‘to send’

When the alveolar sibilant combines with the palatal medial, it becomes the alveolo-palatal initial *x* described below. *s* occurs with the labiovelar medial, as in the following examples:

(29) *sui* 歲 [sʷi], ‘year’

dasuan 大蒜 [ta.sʷæ̃], ‘garlic’

sue 鎖 [sʷə], ‘to lock’

The alveolo-palatal sibilant. The alveolo-palatal sibilant *x* [ɕ] is underlyingly /si/, i.e. an alveolar sibilant with an inherent palatal medial, and is thus in complementary distribution with the alveolar sibilant. It occurs with all vowels except *ai* and *ei* (see section 3.3.1).

(30) *xo* 小 [ɕɔu̯], 'small'

xang 想 [ɕɑ̃], 'to think'

xeuzi 袖子 [ɕɯ.tsɻ], 'sleeve'

xining-xe 西寧些 [ɕi.nĩ.ɕe], 'from Xining'

Due to its inherent palatal glide, when the alveolo-palatal sibilant combines with the labiovelar, the result is the palato-labial medial.

(31) *xuyo* 需要 [ɕy.jɔu̯], 'to need'

xuexo 學校 [ɕʷe.ɕɔu̯], 'school'

xundi 兄弟 [ɕỹ.dɻ], 'younger brother'

The retroflex sibilant. The retroflex sibilant *sh* [ʂ]occurs with all vowels. It is identical to the Standard Mandarin retroflex sibilant.

(32) *sheu* 手 [ʂɯ], 'hand'

nianshi 年時 [nʲĩɛ̃.ʂɻ̩], 'kill'

sho 少 [ʂɔu̯], 'few, little'

she 蛇 [ʂə], 'snake'

Like the other retroflex initials, the retroflex sibilant does not combine with the palatal medial. It occurs with the labiovelar medial.

(33) *shuiniu* 水牛 [ʂʷi.nʲɯ], 'water buffalo'

shue 說 [ʂʷə], 'to say'

The retroflex sibilant tends to be pronounced as a labiodental fricative [f] when combined with the labiovelar glide[8], as in (34). This has been reported also for Xunhua (Dwyer 1995):

(34) *fu* 書 [fʮ], 'book' SM *shū*

fue 說 [fʷə], 'to say' SM *shuō*

feido 水稻 [fi.tɔu̯], 'rice paddy' SM *shuǐdào*

futan 舒坦 [fʮ.tʰæ̃], 'comfortable' SM *shūtan*

3.2.3.2 Non-sibilant fricatives

The labiodental fricative *f* [f]occurs with the vowels *a*, *e*, *ei*, and *u*.

(35) *feizi* 肺子 [fi.t͡sʐ̩], 'lung'

fufei 浮水 [fʮ.fi], 'to swim'

fangzi 房子 [fɑ̃.tsʐ̩], 'house'

fejo 佛教 [fo.t͡ɕɔu̯], 'Buddhism'

As mentioned in section 3.2.3.1, *f* can also represent the underlying sequence /sru-/, i.e. the retroflex sibilant plus the labiovelar medial. The underlying representations /fu/ and /sru/ are thus sometimes pronounced the same way, as in:

(36) *fu* 書 /sru/ [fʮ], 'book'

daifu 大夫 /tai.fu/ [tɛ.fʮ], 'doctor'

The velar fricative. The unvoiced velar fricative *h* [x] occurs with all vowels.

(37) *ho* 好 [xɔu̯], 'good'

haipa 害怕 [xɛ.pʰa], 'be afraid of'

[8] There could be a distinction between Hui and non-Hui speakers here: Dede (2003: 335) notes that Hui speakers of the Xining dialect do not pronounce *shu-* as *f-*. It is possible that the same holds also for Gangou.

heuzi 猴子 [xʉ.tsz̩], ‘monkey’

hanta 汗塌[9] [xæ̃.tʰa], ‘shirt’

The velar fricative does not combine with the palatal medial or the palato-labial medial, but it is readily found together with the labiovelar medial:

(38) *hue* 喝 [xʷə], ‘to drink’

hua 花 [xʷa], ‘flower’

xihuan 喜歡 [ɕ.xʷæ̃], ‘to like’

lohuihui 老回回 [lɔu̯.xʷi.xʷi], ‘Hui people’

3.2.4 Nasals

Gangou has two nasals in initial position: a labial nasal *m* and an alveolar nasal *n*.

The labial nasal. The labial nasal *m* [m] occurs with all vowels.

(39) *mimo* 眉毛 [mz̩.mɔu̯], ‘eyebrow’

mowa [mɔu̯.ʊa], ‘cat’

mue 沒 [mʷə], negative particle

The labial nasal does not combine with the labiovelar glide, except when followed by the nuclear vowel *e*, in which case the medial is non-contrastive. Like the labial stops *b* and *p*, *m* tends to be pronounced with the labiovelar medial when occurring with the nuclear vowel *e*, as in the word *mue* in (39) above. Below are two examples where *m* occurs with the palatal medial:

(40) *miu* 沒有 [mʲʉ], ‘there isn’t/aren’t’

mianyar [mʲæ̃.jaˇ], ‘noodles’

[9] These are the characters given for this word in Dede (2006), but the author notes that the word is of uncertain origin (Dede 2006: 326).

The alveolar nasal. Like *m*, the alveolar nasal *n* [n] can occur with all vowels.

(41) *ni* 你 [nʐ̩], ‘you’

nanren 男人 [næ̃.ɻɪ̃], ‘man’

The alveolar nasal combines with the palatal medial and the palato-labial medial. Unfortunately, no example

(42) *niureu* 牛肉 [nʲɯ.ɻɯ], ‘beef’

niezhang [nʲe.t͡ʂɑ̃], ‘poor’

nyren 女人 [nʐ̩ʷ.ɻɪ̃], ‘woman’

nue 餓 [nʷə], ‘hungry’

Initial *n* tends to occur where Standard Mandarin has the so-called zero initial. This *n* corresponds to the LateMiddle Chinese prenasalized velar initial 疑 /ᵑg-/ (in most reconstructions, this initial is reconstructed as a velar nasal /ŋ/). The preservation of the nasal in these contexts has been reported also for Xunhua (Dwyer 1995). The following examples all have a prenasalized velar initial in Late Middle Chinese, and a zero initial in Standard Mandarin:

(43) *nue* 餓 [nʷə], ‘hungry’

nue 鵝 [nʷə], ‘goose’

nian 眼 [nʲæ̃], ‘eye (as a prefix)’

nio 咬 [nʲɔu̯], ‘to bite’

3.2.5 Approximants

Gangou has three approximant phonemes in initial position: *y*, *w* and *r*. The approximants are analysed as medial glides occurring as the initial element of the syllable in the absence of an initial consonant.

The palatal approximant. Initial *y* [j] is the palatal medial glide in initial position and for this reason it does not occur with the vowels *ai* and *ei*: we do not find the syllables **yai* /iai/ or **yei* /iei/.

(44) *yeu* 有 [jɯ], 'have'

yateu [ja.tʰɯ], 'girl, daughter'

yo 要 [jɔu̯], 'shall, want'

yezi 葉子 [je.tsɻ], 'leaves'

The labiovelar approximant. Initial *w* [ʊ] is the labiovelar medial glide in initial position and thus does not occur with the vowels *eu* and *o* (see section 3.3.2). It is different from its Standard Mandarin equivalent, which is a labiovelar approximant [w].

(45) *we* 我 [ʊə], 'I'

wawa [ʊaʊa], 'son, boy'

waimian 外面 [ʊɛ.mi̯ɛ̃], 'outside'

weixian 危險 [ʊi.ɕɛ̃], 'dangerous'

The palato-labial approximant. Initial *yu* [jʷ] is the palato-labial medial glide in initial position and only occurs with the vowel *e* and the sequence *-an*. When it stands alone, *yu* is pronounced as a syllabic, rounded, voiced alveolo-palatal fricative [ʑ̩ʷ]. When followed by *e* or *an*, it is pronounced as a rounded palato-labial approximant [jʷ].

(46) *yu* 魚 [ʑ̩ʷ], 'fish'

yue 月 [jʷe], 'moon, month'

yuan 遠 [jʷæ̃], 'far away'

The retroflex approximant. Initial *r* [ɻ] is the retroflex medial glide in initial position. Its pronunciation ranges between a retroflex fricative and a retroflex approximant [ʐ~ɻ].

(47) *re* 熱 [ɻə], 'warm, hot'

reu 肉 [ɻɯ], ‘meat’

rufang 乳房 [ɻu.fɑ̃], ‘breast’

ro 繞 [ɻɔu̯], ‘to go around, circle’

3.2.6 Liquid

The liquid initial *l* [l] occurs with all vowels. When followed by the vowel *u*, it tends to be slightly velarized, as in the word *lu* below:

(48) *lama* 喇嘛 [la.ma], ‘Lama’

huli 狐狸 [xʊ̩.lʐ̩], ‘fox’

loha 老漢 [lɔu̯.xa], ‘Han people’

lu 路 [ɬʊ̩], ‘road’

The liquid can be combined with the palatal, labiovelar and palato-labial glides.

(49) *liu* 六 [lʲɯ], ‘six’

lue-lio 落了 [lʷə.lʲɔu̯], ‘has fallen’

lyshe 旅社 [lʐ̩ʷ.ʂə], ‘hotel’

3.3 Medial glides

Gangou has three medial glides phonologically, a palatal, a labiovelar, and a palato-labial medial. The term medial glide refers to the position of these glides between the initial and the nuclear vowel, as opposed to final glides, which are found at the end of the syllable as described in section 3.3.5. Due to their position before the nuclear vowel, medial glides are also known as prenuclear glides (for example, Duanmu 2000). As previously discussed, the prenuclear glides are considered to be part of the onset rather than the coda to better reflect the interaction between medial glides and initials.

The medial glides surface either as true glides, i.e. as phonetically distinguishable elements, or they can be integrated with the initial consonant. The retroflex medial differs from the other three in that it does not surface as a phonetically distinguishable element and is thus only present underlyingly, unless it occurs as the first element of the syllable.

3.3.1 The palatal glide /i/

The palatal glide /i/ has the effect of raising the tongue up towards the roof of the mouth, creating palatalization. It is represented orthographically by the letter *i* syllable-medially (except when following the alveolar sibilant and the retroflex initials), and by *y* when occurring as an initial. The palatal medial may or may not affect the nature of the initial. It surfaces as a separate element with the dental stops, the nasals and *l*:

(50) *liu* 六 [lʲɯ], ‘six’

nian 年 [nʲæ̃], ‘year’

mio 廟 [mʲɔu̯], ‘temple’

dio 掉 [tʲɔu̯], *verb particle*

As previously discussed, it integrates with the alveolar affricate and fricative to form the alveolo-palatal affricates *j* and *q,* and the fricative *x*, which are underlyingly /tsi/, tshi/, and /si/ respectively. In Gangou, the glide tends to disappear completely, while in Standard Mandarin it can be perceived. The following example in Gangou is compared with Standard Chinese:

(51) *jian* 見 [t͡ɕɛ̃], ‘to see’ SM *jiàn* [tɕi̯ɛn]

3.3.2 The labiovelar glide /u/

The labiovelar glide /u/ has the effect of rounding the lips. It has no effect on the initial consonants preceding it. Orthographically, it is represented by *-u,* or *w-* in initial position.

(52) *gua* [kʷa], ‘dumpling’

kuan 寬 [kʰʷæ̃], ‘broad, wide’

nianlui 眼淚 [nʲæ̃.lʷi], ‘tears’

Unlike the palatal glide, the labiovelar glide can combine with the retroflex glide, as in the following examples:

(53) *zhuezi* 桌子 [t͡ʂʷə.t͡sɻ̩], 'table'

chue 戳 [t͡ʂʰʷə], 'to stab'

Two examples have been found where a labiovelar glide that is present in Standard Mandarin has been dropped in Gangou:

(54) *gaigung* 拐棍 [kɛ.kũ], 'walking stick' cf. SM *guǎigùn*

danwujie 端午節 [tæ̃.ụ̩.t͡ɕe]. 'Dragon Boat Festival' cf. SM *duānwǔjié*

3.3.3 The palato-labial glide /y/

The labiopalatal glide /y/ combines the features of the palatal medial and the labiovelar glide; palatalization and rounding of the lips occur simultaneously. It is the rounded correspondent of the palatal medial glide /i/. In Chinese linguistics, this medial glide is often transcribed using the non-standard symbol [ɥ] but using IPA it can be transcribed by means of the combined symbol [jʷ]. It is represented orthographically by the letter *y*, except when following alveolo-palatals, where it is written as *u*. As an initial, it is written as *yu*.

Underlyingly, the palato-labial glide can be broken down into the sequence /iu/. For example, the syllable *xue* 學 below is underlyingly /siue/ or /sye/.

In medial position, the distribution of the palato-alveolar glide is more limited than the palatal and labiovelar glides. In the examples below, it occurs in the sequences *xu-*, *ju-*, and *qu-*. Standard Mandarin also has the syllables *nüè* and *lüè* (=*nye*, *lye*). Unfortunately, no examples using these syllables were elicited.

(55) *daxue* 大學 [ta.ɕʷe], 'university'

juede 覺得 [t͡ɕʷe.tə], 'to feel, think'

quanbu 全部 [t͡ɕʰʷæ̃.pụ̩], 'whole, all of it'

Unlike the other glides, the palato-labial glide only occurs medially. In other Sinitic languages, like Cantonese, a palato-labial can be found syllable-finally, as in the word *loei* 累 [lʊy̯] ‘tired’.

3.4 Vowels

Gangou has nine vowel phonemes, including the fricative vowels *i, u* and *y,* the nuclear vowels *a* and *e* and the combined vowels *ai, ei, eu,* and *o.* The vowel phonemes are shown in table 8:

	front	central	back
high	*i* [ʐ̩~ʑ̩], *y* [ʐ̩ʷ~ʑ̩ʷ] *ei* [i]		*eu* [ɯ] *u* [ʊ̩]
mid	*ai* [ɛ]	*e* [ə]	*o* [ɔu̯]
low	*a* [a]		

Table 8: Gangou vowel phonemes.

Nuclear and combined vowels. Gangou has two nuclear vowels: *a* and *e.* These combine with the final glides /i/ and /u/ to form the combined vowels *ai* /ai/, *ei* /ei/, *o* /au/ and *eu* /eu/. The basic pronunciation of the nuclear and combined vowels presented below is the realization of these vowels when there are no medial glides or final nasals present in the syllable:

Vowel phoneme	Basic pronunciation	Example with initial *l-*
a	[a]	*la* 辣 [la], ‘hot, spicy’
ai	[ɛ]	*lai* 來 [lɛ], ‘to come’
e	[ə]	*le* 樂 [lə], ‘happy’
ei	[i]	*lei* 累 [li], ‘must’
eu	[ɯ]	*leu* 樓 [lɯ], ‘building’
o	[ɔu̯]	*lo* 老 [lɔu̯], ‘old’

Table 9: Gangou nuclear and combined vowels.

The fricative vowels. Besides the nuclear and combined vowels, Gangou has three phonemes that surface as fricative vowels when occurring as the last element of a syllable, i.e. when there is no nasal final present. On the deep level, these vowels are the glides /i/, /u/, and /y/

occurring as the nuclear vowel of the syllable. The pronunciations of these vowels vary depending on the point of articulation of the initial consonant, aspiration as well as the degree of vowel reduction (see section 4.2.2) in normal speech. Table 10 demonstrates the various pronunciations of the fricative vowels *i, u,* and *y*. In normal speech, and especially after aspirated initials, fricatives and affricates, they tend to become voiceless. See section 3.4.7 for a detailed description.

Fricative vowel	Surface realizations	Example
i /i/	[ʐ̩] [ʑ̩~ɕ̩]	*li* 哩 [lʐ̩], *irrealis/locative marker* *didian* 地點 [tʐ̩.tʲɛ̃], 'place' *ji* 幾 [t͡ɕʑ̩], 'how many' *pichai* 劈柴 [pʰɕ̩. t͡ʂʰɛ], 'to chop firewood'
u /u/	[ʊ̩]	*lu* 鹿 [ɬʊ̩], 'deer'
y /y/	[ʐ̩ʷ] [ʑ̩ʷ]	*lyshe* 旅社 [lʐ̩ʷ.ʂə], 'hotel' *yu* 魚 [ʑ̩ʷ], 'fish'

Table 10: Gangou fricative vowels.

Besides the fricative vowels, there are two additional sounds in Gangou that are also written using the graph *i*. They have been described for Standard Mandarin as syllabified consonants (Duanmu 2000: 36-37) and occur after the alveolar and retroflex affricates and fricatives:

Syllabified consonant	Surface realizations	Example
alveolar *i* (after *s, z, c*)	[ʐ̩~ʂ̩]	*si* 四 [sʐ̩], 'four' *zi* 字 [t͡sʐ̩], 'character' *ci* 詞 [t͡sʰ̩], 'word'
retroflex *i* (after *sh, zh, ch*)	[ɻ̩~ʐ̩~ʂ̩]	*shengri* 生日 [ʂɨ̃ŋ.ɻ̩], 'birthday' *zhi* 紙 [t͡ʂʐ̩], 'paper' *chibang* 翅膀 [t͡ʂʰ̩.pɑ̃], 'wing'

As explained in section 2, syllables containing syllabified consonants are regarded as vowelless in the present analysis. In the syllable diagram, syllables containing alveolar or retroflex *i* consist of only an initial: *si* /s/, *zi* /ts/, *ci* /tsh/, and *sh* /sr/, *zh* /tsr/, *ch* tshr/.[10]

[10] In Chinese linguistics, the surface realizations of the phoneme /i/ and what are here referred to as syllabified consonants are known as apical vowels, which are transcribed using non-standard syllables. Apical (from Lat.

Next, the vowels are presented in turn. For each vowel, the basic pronunciation, i.e. the pronunciation of the vowel with no medial or final nasal present in the syllable, is given first. After that, the different allophonic variants of the vowels are given. Diachronically, the four vowels *ai, au, ei,* and *eu,* have developed from diphthongs, while the nuclear vowels *a* and *e* were monophthongs also in Middle Chinese (many Gangou syllables containing *e* had stop endings in Middle Chinese). This fact is reflected in the distribution of the different vowels as described below. The plain vowels *a* and *e* are close in pronunciation to their equivalents in Standard Mandarin, while the monophthongized vowels *ai, ei, o,* and *eu* are pronounced as diphthongs in Standard Mandarin.

3.4.1 The vowel *a*

The nuclear vowel *a* is an open front unrounded vowel [a]. It is identical to the Standard Chinese pronunciation. As explained in section 2.1.2, *a* is one of the nuclear vowels of Gangou, i.e. one of the vowels occupying the Vowel slot in the syllable tree diagram.

(56) *ta* 他 [tʰa], ‘he’

la 辣 [la], ‘spicy, hot’

Medial glides have no effect on the pronunciation of *a.*

(57) *jia* 家[t͡ɕa], ‘home’

hua 花 [xʷa], ‘flower’

When followed by a final nasal, *a* takes one of its allophonic surface forms. Final *-n* has the effect of closing the oral cavity somewhat, changing *a* into the near-open nasalized vowel [æ̃].

(58) *gan* [kæ̃], ‘dry’

man 滿 [mæ̃],‘full’

apex ‘point, tip’) refers to the engagement of the tip of the tongue in the pronunciation of these vowels. In Lee & Zee’s words: “The apical vowels are so-called because during production the tip (apex) or blade of the tongue and the anterior part of the palate form a narrow linguo-palatal constriction” (Lee & Zee 2016). According to the Chinese convention, [ɿ] is the symbol used for the alveolar syllabified consonant (as in *si, zi, ci*) while [ʅ] is the retroflex syllabified consonant (*shi, zhi, chi, ri*). [ʮ] is the rounded counterpart of [ɿ] (as in *ly, ny, xu* etc.) while [ʯ] is the retroflex counterpart of [ʯ] (no equivalent in Gangou).

The medial glide /i/ causes some further closing of the oral cavity in syllables ending in *-an*, like in Standard Mandarin:

(59) *jian* 見 [tɕɛ̃], 'see' cf. SM *jiàn* [tɕi̯ɛ̃(n)]

xian 鹹 [ɕɛ̃], 'salty' cf. SM *xiàn* [ɕi̯ɛ̃(n)]

lian 臉 [lʲɛ̃], 'face' cf. SM *liàn* [li̯ɛ̃(n)]

Final *-ng* has a backing effect on *a,* due to the feature [+back] of the velar nasal, yielding the pronunciation [ɑ̃].

(60) *chang* 長 [tʂʰɑ̃] 'long'

liang 兩 [lʲɑ̃] 'two (used with classifiers)'

3.4.2 The vowel *ai*

The nuclear vowel *ai* is an open-mid front unrounded vowel [ɛ]. *ai* is underlyingly /ai/, i.e. it consists of the nuclear vowel /a/ plus the final glide /i/. The fact that it has developed from a diphthong is sometimes reflected phonetically as a slight articulatory movement: [æɛ̯]. Throughout this thesis, it is transcribed as [ɛ].

(61) *lai* 來 [lɛ], 'to come'

mai 買 [mɛ], 'to buy'

kai 開 [kʰɛ], 'to open'

Since *ai* is underlyingly /ai/, it does not combine with the palatal medial glide /i/. For this reason, it does not occur with the palatal initials *j, q,* and *x,* which underlyingly contain the medial glide. The underlying final element /i/ of *ai* also explains why it cannot be followed by a nasal final. The labiovelar medial glide /u/, on the other hand, combines readily with *ai*:

(62) *huai* 壞 [xʷɛ], 'broken'

kuai 快 [kʰʷɛ], 'fast'

wai 外 [ʊɛ], ‘outside’

3.4.3 The vowel *e*

The nuclear vowel *e* is a mid-central vowel with the basic pronunciation [ə]. It is the second of the two nuclear vowels of Gangou and is underlyingly /e/. *e* is often slightly velarized: [ˠə].

(63) *age* 阿哥 [akə], ‘elder brother’

che 車 [tʂʰə], ‘car, vehicle’

re 熱 [ɻə], ‘hot’

The palatal medial glide /i/ has a fronting effect on *e*, changing it to the close-mid front unrounded vowel [e].

(64) *qie* 切 [tɕʰe], ‘to cut’

miedio 滅掉 [mʲe.tʲɔu̯], ‘to eliminate, to go out (of lights)’

tebie 特別 [tʰə.pʲe], ‘special’

The labiovelar medial sometimes occurs with the nuclear vowel *e* as an allophonic variation of medialless counterparts. This is the case with the initials *g, h* and *n*, which are frequently pronounced with rounding when combining with *e*. These allophonic variants are more characteristic of Gangou, while their medialless counterparts represent standard pronunciation.

(65) *he* 喝 [hʷə], ‘to drink’

nue 餓 [nʷə], ‘hungry’

gueren 個人 [kʷə.ɻɪ̃], ‘myself; personal’

With the labial initials *m, b,* and *p,* the labiovelar medial is nearly always present, as previously described.

(66) *mue* 沒 [mʷə], *negative particle*

pue 破 [pʰʷə], ‘to break’

bueleiga [pʷə.li.ka], ‘knee’

As for the rest of the initials, the labiovelar glide is a contrastive element. Compare, for example, the words *che* 車 [t͡ʂʰə] and *chue* 戳 [t͡ʂʰʷə]. Note that the underlying sequence /ue/ corresponds to the *pinyin* ending *-uo* in Standard Mandarin. In some Gangou words, the lips tend to stay rounded throughout the pronunciation of the syllable, especially in rapid speech, yielding the pronunciation [o]:

(67) *zuozhili a* 做著哩啊 [t͡so.t͡ʂ̩.lɪ.a], ‘is doing’

When followed by a nasal final, *e* is raised and nasalized and becomes [ɪ̃]. The sequences /-en/ and /-eŋ/ are pronounced the same utterance-finally. Utterance-medially, however, the difference is sometimes made, and for this reason the two nasals are kept distinct orthographically.

(68) *damen* 大門 [ta.mɪ̃], ‘door’

feimeng 睡夢 [fi.mɪ̃], ‘dream’

3.4.4 The vowel *ei*

The nuclear vowel *ei* is a close front unrounded vowel [i]. In a similar way as *ai*, *ei* consists of the nuclear vowel /e/ and the final glide /i/. The pronunciation of *ei* is different from its equivalent in Standard Mandarin, which is written in the same way in *pinyin*.

(69) *meizi* 妹子 [mi.t͡sz̩], ‘younger sister’

gei 給 [ki], ‘to give’

fei 飛 [fi], ‘to fly’

This vowel has the same distribution as that of *ai,* and thence does not occur with the medial glide /i/. The labiovelar glide combines with *ei* to form the underlying sequence /-uei/, which is written as *-ui*.

(70) *gui* 貴 [kʷi], ‘expensive’

nianlui 眼淚 [nʲæ̃.lʷi], ‘tears’

tuizi 腿子 [tʰʷi.t͡sʐ̩], ‘leg’

Since *ei* already contains a final element /i/ it cannot be followed by a nasal final.

3.4.5 The vowel *eu*

The nuclear vowel *eu* is a close back unrounded vowel [ɯ]. This vowel underlyingly consists of the nuclear vowel /e/ followed by the final glide /u/, and as with the other monophthongized vowels, the pronunciation of *eu* involves some articulatory movement, in this case of the lips: it tends to go from unrounded to rounded: [ɯᵾ]. The pronunciation of *eu* varies somewhat depending on the preceding initial. With the retroflex initials and when following the palatal medial glide, it tends to be more rounded, close to [ʉ]. It is pronounced with the lips compressed (not protruded), similarly to the Japanese *ū* in *kūki* 空気 ‘air’. It is transcribed throughout this thesis as [ɯ].

(71) *sheu* 手 [ʂɯ], ’hand’

liu 六 [lʲɯ], ‘six’

gangeu 甘溝 [kæ̃.kɯ], ‘Gangou’

teuming 頭名 [tʰɯ.mĩ], ‘the first’

eu doesn’t occur with the labiovelar medial glide, due to the underlying final element /u/. It occurs with the palatal medial glide, which has no salient effect on the pronunciation of *eu*.

(72) *niu* 牛 [nʲɯ], ‘cow’

miu 沒有 [mʲɯ], ‘don’t have, there isn’t’

yeu 有 [jɯ], ‘to have; there is/are’

3.4.6 The vowel *o*

The nuclear vowel *o* is an open-mid back rounded vowel [ɔ]. *o* is analysed as underlyingly /au/, i.e. the phoneme /a/ with the final element /u/. On the phonetic level, the fact that it has

developed from a diphthong can be perceived as a slight further rounding of the lips toward the end of the syllable: [ɔu̯]. *o* is less monophthongized than the other combined vowels and is therefore transcribed as [ɔu̯] throughout the present thesis.

(73) *ho* 好 [xɔu̯], 'good'

go 高 [kɔu̯], 'high, tall'

lo 老 [lɔu̯], 'old'

mimo 眉毛 [mi̯.mɔu̯], 'eyebrow'

Due to the underlying element /u/, *o* does not combine with the labiovelar medial glide (see section 3.5). It occurs frequently with the palatal glide /i/.

(74) *lio* 了 [li̯ɔu̯], perfective suffix

nio 咬 [ni̯ɔu̯], 'to bite'

jio 教 [tɕɔu̯ɻ], 'to teach'

bio 不要 [pi̯ɔu̯], 'don't'

3.4.7 The fricative vowels *i, y* and *u*

According to the present analysis, the fricative vowels are glides occurring as a nuclear vowel. The production of these vowels involves a narrowing of the oral cavity, hence the name fricative vowel. I follow the *pinyin* system by representing the unrounded fricative vowel as *i* and the rounded fricative vowel as *u*. In the case of orthographic *i,* it should be noted that it has many surface realizations, none of which correspond to the close front unrounded vowel [i], which in Gangou is represented by the digraph *ei* (see section 3.4.4).

The palato-alveolar vowel ɿ. The palato-alveolar vowel *i* is the syllabified form of the palatal medial /i/. When following an alveolo-palatal fricative or affricate, *i* is pronounced as a voiced or, in rapid speech, unvoiced alveolo-palatal fricative: [ʑ̩] or [ɕ̩].

(75) *xuexi* 學習 [ɕye.ɕʑ̩], 'to study'

jizi 機子 [t͡ɕʑ̩.t͡sʐ̩], ‘machine’

dungxi-ha 東西哈 [tuŋ.ɕ.xa], ‘things (accusative form)’

qi-li 去哩 [t͡ɕʰ.lʐ̩], ‘will/shall go’

With other initials, the pronunciation of palato-alveolar *i* is closer to a syllabic alveolar fricative: [ʐ̩].

(76) *ni* 你 [nʐ̩], ‘you’

limian 裏面 [lʐ̩.mʲɛ̃], ‘inside’

mifan 米飯 [mʐ̩.fæ̃], ‘rice’

When followed by a nasal, palato-alveolar *i* is nasalized and pronounced without linguo-palatal constriction: [ĩ].

(77) *hanmin* 漢民 [xæ̃.mĩ], ‘Han people’

senlin 森林 [sɨ̃n.lĩ], ‘forest’

minzu 民族 [mĩn.tsʊ̩], ‘ethnicity, minority group’

jingzi 鏡子 [t͡ɕĩŋ.t͡sʐ̩], ‘mirror’

The palato-labial vowel y. As previously mentioned, *y* is the rounded counterpart of palatal *i*. It is represented by the graph *y* after non-palatalized initials, and *u* after the alveolo-palatal initials *x, j,* and *q*. The pronunciation of *y* ranges from a palato-labial fricative (after *x, j* and *q*) to an alveolo-labial fricative (after *l* and *n*): [ʑʷ~ʐ̩ʷ].

(78) *nyren* 女人 [nʐ̩ʷ.ɻĩ], ‘woman’

lyjur 驢駒兒 [lʐ̩ʷ.t͡ɕəˇ], ‘donkey foal’

juzi 橘子 [t͡ɕʑ̩ʷ.t͡sʐ̩], ‘tangerine’

yu 魚 [ʑʷ], ‘fish’

When followed by a nasal, *y* is pronounced [ỹ]. This sequence is written as *-un* after the alveolo-palatal initials *x, j,* and *q,* and as *-yn* after *l* and *n*:

(79) *xundi* 兄弟 [ɕỹn.dz̩], ‘little brother’

yun 用 [jỹ], ‘to use’

jun 俊 [tɕỹ], ‘handsome, pretty’

pinqun 貧窮 [pʰĩn.t͡ɕʰỹ], ‘poor’

lun 輪 [lỹ], ‘wheel’

The labiovelar vowel u. The labiovelar vowel *u* occurs with all initials except the alveolo-palatals *x, j,* and *q,* which have an inherent palatal glide. Its pronunciation ranges between a labiodental approximant and a close back rounded vowel [ʋ̩~u]. In rapid speech, voicing may disappear, yielding a syllabic, voiceless labiodental fricative [f̩].

(80) *du* 讀 [tʋ̩], ‘read aloud’

ku 哭 [kʰʋ̩], ‘to cry’

ku-zhili 哭著哩 [kf̩.tʂz̩.lz̩], ‘is crying’

Initial *l* tends to become velarized when preceding *u.*

(81) *lu* 鹿 [ɬʋ̩], ‘deer’

When followed by a nasal, *u* becomes a nasalized close back rounded vowel [ũ]. Note that when occurring with /u/, the nasal is written as *-ng,* as opposed to *-n*, which occurs with /y/. In Standard Mandarin, the words *cun* [t͡sʰʊə̯n] and *cong* [t͡sʰuŋ] are pronounced differently, while in Gangou the aforementioned words (both written as *cung* in Gangou) are pronounced in the same way.

(82) *cung* 村 [tsʰũ], ‘village’

cung 從 [tsʰũ], ‘from’

Vowel reduction. When the fricative vowels *i, u* and *y* occur word- or utterance-medially, and with no nasal or rhotic final attached to them, they tend to become subject to vowel reduction. Vowel reduction is here defined as a shortening of the duration of the vowel making the affected syllables monomoraic, as opposed to full, bimoraic syllables. See section 4.1 for a more detailed description.

Another type of vowel reduction is the tendency in some words for a nuclear or combined vowel to be shortened to an alveolo-palatal or labiovelar fricative vowel. The following words have been found exhibiting this tendency:

(83) *yipa* 尾巴 [ʐ̩.pʰa], 'tail' cf. Standard Mandarin *weiba*

mimo 眉毛 [mʐ̩.mɔu̯], 'eyebrow' cf. Standard Mandarin *meimou*

du 都 [tʊ̩], 'all' cf. Standard Mandarin *dou*

3.4.8 Syllabified consonants

The alveolar syllabified consonant. The alveolar syllabified consonant, which is represented orthographically as *i,* occurs with the alveolar affricates *z* and *c* and the alveolar fricative *s*. It is pronounced as a voiced dental fricative [z̪]. Voicing tends to disappear in rapid speech, in which case *i* is realized as the unvoiced fricative [s̪]. As explained in section 2.1.2, these syllables underlyingly contain only an initial, as in *zi* /ts/.

(84) *zi* 字 [t͡sz̪], 'letter, character'

simio 寺廟 [s̪.mʲɔu̯], 'temple'

ci 詞 [t͡sʰz̪], 'word'

The retroflex syllabified consonant. The retroflex syllabified consonant, which is also represented orthographically as *i,* occurs with the retroflex affricates *zh* and *ch* and the retroflex fricative *sh*. The pronunciation of *i* after retroflex initials ranges between a syllabic, retroflex approximant and a corresponding fricative: [ɻ̩~ʐ̩]. Voicing can disappear in rapid speech, especially after aspirated initials, yielding the pronunciation [ʂ̩].

(85) *chi* 吃 [tʂʰʐ̩], 'to eat'

zhi 知 [tʂʐ̩], ‘to know’

chibang 翅膀 [t͡ʂʰ.pɑ̃], ‘wing’

chizhili [t͡ʂʰ.t͡ʂʐ̩.lj̩], ‘(am/are/is) eating’

Since they are not vowels in the sense that they cannot occupy the Vowel slot in the syllable diagram, the syllabified consonants cannot be nasalized.

3.5 Finals

The final position in the syllable structure of Gangou can be occupied by a glide, a nasal or the rhotic suffix /-er/. Diachronically, Middle Chinese stop finals (-k, -t, -p) have been lost in Gangou. Gangou has also merged Middle Chinese final /-m/ with /-n/ and, in some cases, lost the distinction between Middle Chinese /-n/ and /-ŋ/, as described below. To summarize, the final elements of Gangou are the rhotic suffix /-er/, the nasal finals /-n, -ŋ/ and the final glides /-i, -u/.

As explained in section 2, there is a dissimilatory principle in Gangou that disallows medial and final glides of the same type to occur in the same syllable. In other words, there cannot be two labiovelar glides or two palatal glides in the same syllable. This explains why we do not find syllables such as **jai* and **gueu,* which are underlyingly /tsiai/ and /kueu/, although they would be quite unproblematic from a phonetic point of view: [t͡ɕɛ] and [kʷɯ].

There is another principle relating to the finals in Gangou that disallows the presence of more than one final at the end of the syllable. For example, this means that the monophthongized vowels *ai, ei, eu,* and *o,* which already contain a final glide, /i/ or /u/, cannot be nasalized.

The rhotic suffix /-er/ deletes any final element when it is attached to a syllable, so that when the vowel *ai*, for example, is rhotacized, it becomes *ar*, as in *nanhar* 男孩兒(from *nanhai*), ‘boy’. See section 3.5.3 for a detailed description.

3.5.1 Final glides /i/ and /u/

The final glide /i/ raises the nuclear vowel while the final glide /u/ has the effect of labializing it. One characteristic of the Gangou vowel system is that many Standard Chinese diphthongs have been reduced to monophthongs phonetically, as described in section 3.4. According to

the present analysis, Standard Mandarin diphthongs are treated in Gangou as a combined sequence containing a nuclear vowel and an underlying final glide /i/ or /u/. This is motivated by the fact that the monophthongized vowels behave differently from the nuclear vowels *a* and *e*, which do not contain any final element. According to this analysis, the monophthongized vowels *eu* and *o* contain the final glide /u/ while *ai* and *ei* contain the final glide /i/ underlyingly.

3.5.1.2 Final /u/

Phonetically, instead of treating *eu* and *o* as diphthongs, describing them as a main vowel plus the final glide /-w/ is closer to the actual pronunciation of these vowels. They are very close to simple vowels, although sometimes with a slight glide toward labialization at the end. The underlying representations of the nuclear vowels *eu* and *o* are /eu/ and /au/ respectively, as previously described. There is a diachronic motivation for analysing the vowels *eu* and *o* as underlyingly /eu/ and /au/. The corresponding syllable types in Late Middle Chinese have the endings /-əw/ and /-aw/. Compare the following examples (the first two are from the *xiao* group (效攝) of Late Middle Chinese finals, the last two from the *liu* group (流攝). It can be seen that they all have a final /-w/):

Example character	Gangou	Standard Mandarin	Middle Chinese
老	*lo*	*lǎo*	/lɑw/
叫	*jo*	*jiào*	/kiew/
狗	*geu*	*gǒu*	/kɤw/
有	*yeu*	*yǒu*	/ɣɯw/

Table 11: Syllables containing final /-w/

3.5.2.3 Final /i/

Final /i/ is present underlyingly in the nuclear vowels *ai* and *ei*, which are analysed as /ai/ and /ei/ respectively. In both cases, the palatal final glide has the effect of raising the nuclear vowel. As with syllables containing a final /u/, syllables with a final /i/ also tend to involve a slight glide toward the end of the syllable; in this case in the form of increased palatalization, i.e. the tongue moving toward the palate.

There is a diachronic motivation for analysing the vowels *ai* and *ei* as underlyingly /ai/ and /ei/. Compare the following examples from the *xie* group (蟹攝) group of Middle Chinese finals, which all contain the final element /-j/:

Example character	Gangou	Standard Mandarin	Middle Chinese
開	*kai*	*kāi*	/kʰɑj/
快	*kuai*	*kuài*	/kʰwæj/
貴	*gui*	*guì*	/kwej/
衛	*wei*	*wēi*	/ɣ̟wej/

Table 12: Syllables containing final /-j/

3.5.2 Final nasals

Gangou has two final nasals: *-n* /n/ and *-ng* /ŋ/. Diachronically, in most Mandarin dialects the Middle Chinese final /m/ has merged with /n/. Gangou has also lost the distinction between /n/ and /ŋ/ in reading pronunciations and utterance-finally, except in the case of the nuclear vowel *a*. Final nasals are realized as a nasalization of the preceding vowel and do not surface as separate elements unless followed by another syllable. The nasalized vowels are given in the table below:

in, ing [ĩ] *un* [ỹ]		*ung* [ũ]
	en, eng [ɪ̃]	
an [æ̃], *ang* [ɑ̃]		

Table 13: Gangou nasalized vowels.

When followed by another syllable, the nasals tend to surface with their underlying values:

(86) *jintian* 今天 [t͡ɕĩn.tʰʲæ̃], ‘today’

jingzi 鏡子 [t͡ɕĩŋ.t͡sɻ], ‘mirror’

When the following syllable starts with a velar, however, final *-n* assimilates and becomes [-ŋ]. In (87), it can be seen that final /ŋ/ resists assimilation (does not change to [n] in front of *t*), since assimilation only occurs when final *-n* is followed by a velar initial:

(87) *mengtian* 明天 [mɪ̃ŋ.tʰʲæ̃], ‘tomorrow’

menkeu 門口 [mɪ̃ŋ.kʰʉ], ‘doorway’

As mentioned in section 3.4.1, the distinction between the alveolar and velar nasal is preserved when the nasal follows the nuclear vowel *a*:

(88) *kan* 看 [kʰæ̃], ‘look, read’

kang 炕 [kʰɑ̃], ‘heatable brick bed, *kang*’

The nasalized vowel *ung* /uN/ is pronounced [ũ]. In Standard Mandarin, there is a distinction between /un/ and /uŋ/, whereas in Gangou, both sequences are pronounced in the same way. Compare the following examples with Standard Mandarin:

(89) *cung* 村 [t͡sʰũ], ‘village’ cf. SM *cūn* [tsʰʊn˥]

cung 從 [t͡sʰũ], ‘from’ cf. SM *cóng* [t͡sʰuŋ˧˥]

The nasalized vowel *yn* /yN/ is pronounced [ỹ]. In Standard Mandarin, there is a distinction between /iuN/ and /yN/, but in Gangou, these sequences are pronounced in the same way:

(90) *yun* 用 [jỹ], ‘to use’ cf. SM *yòng* [juŋ˥˩]

yuncai 雲彩 [jỹ.t͡sɛ], ‘cloud’ cf. SM *yúncai* [jyn˧˥.tsʰaɪ̯˥]

xun 熊 [ɕỹ], ‘bear’ cf. SM *xióng* [ɕi̯uŋ]

The nasalized vowel *en/eng* /eN/ is pronounced [ɪ̃]. There is no distinction between /en/ and /eŋ/ utterance-finally.

(91) *damen* 大門 [ta.mɪ̃], ‘door’

chusheng 出生 [t͡ʂʰʊ̩.ʂɪ̃], ‘to be born’

The nasalized vowel *in/ing* /iN/ is pronounced [ĩ]. Like *en/eng* above, there is no distinction between /in/ and /iŋ/ utterance-finally.

(92) *senlin* 森林 [sĩn.lĩ], ‘forest’

ling 零 [lĩ], ‘zero’

Nasal deletion. There is a tendency in some words for an underlying final nasal to be dropped. The following words have been found exhibiting this tendency:

(93)	*yangyade* 樣樣的 [jɑ̃.ja.tə], ‘all kinds of’	cf. SM	*yàngyàngde*
	qia 錢 [t͡ɕʰa], ‘money’	cf. SM	*qián*
	loha 老漢 [lɔu̯.xa], ‘Han people’	cf. SM	*lǎohàn*
	bueleiga 波棱蓋 [pʷə.li.ka], ‘knee’	cf. SM	*bōlenggài*
	fuganga 樹幹幹 [fu̯.kɐ̃.ka], ‘tree trunk’	cf. SM	*shùgàn*

3.5.3 Rhotic suffix *-er*

Final *-er* is a rhotic suffix that can be either part of the word or optionally attached to certain words, mostly nominals, but sometimes also verbs. Rhotacization, or r-colouring, is a feature that is characteristic of Gangou phonology, as well as other northern varieties Mandarin. It is also common in Mangghuer, as is evident from the name of the language itself. Etymologically, final *-er* comes from the word 兒 *er*, whose original meaning is ‘son’ (Duanmu 2000: 195-197).

Phonetically, final *-er* has the effect of neutralizing the distinction between some vowels, as shown in the table below:

Underlying coda + /-er/	Surface realization with *-er*	Example
/a/ + /er/ = /ar/ /ai/ + /er/ = /ar/ /au/ + /er/ = /aur/ or /er/	*-ar* [aˠ] *-air* [aˠ] *-or* [ɔˠ]	*huar* 花兒 [xʷaˠ], ‘flower’ *hair* 孩兒 [xaˠ], ‘child’ *qior* 雀兒 [t͡ɕʰɔˠ], ‘bird’
/e/ + /er/ = /er/ /ei/ + /er/ = /er/ /eu/ + /er/ = /er	*-er* [əˠ] *-eir* [əˠ] *-eur* [əˠ]	*ber* 本兒 [pəˠ], *classifier for books* *weir* 味兒 [ʋəˠ], ‘smell’ *sheuzhiteur* 手指頭兒 [ʂɯ.t͡ʂ̩.tʰəˠ], ‘finger’
/u/ + /er/ = /er/ or /uer/ /i/ + /er/ = /er/ /y/ + /er/ = /yer/	*-ur* [əˠ], [ʷəˠ] *-ir* [əˠ] *-uer* [jʷəˠ]	*xifur* 媳婦兒 [ɕ.fəˠ], ‘woman, wife’ *tur* 兔兒 [tʰʷəˠ], ‘rabbit’ *jir* 鷄兒 [t͡ɕəˠ], ‘chicken’ *gayuer* 尕魚兒 [ka.jʷəˠ], ‘small fish’

Table 14: Gangou codas with the rhotic suffix -er

Table 14 shows that when the rhotic suffix /-er/ is attached to a syllable, it merges with the coda of the original syllable. In syllables containing the nuclear vowel /a/, the /a/ is kept while the vowel of the suffix is deleted yielding /-r/. The coda /au/ is sometimes kept as such when combined with /er/ and the /e/ of the suffix is deleted. Sometimes /au/ is deleted. When the rhotic suffix is attached to syllables containing /e/, the two nuclear vowel /e/ and the /e/ of the suffix merge. The rhotic suffix has the effect of deleting any other final element following nuclear /e/. The vowel /i/ is deleted when /-er/ is attached. The vowel /u/ is sometimes deleted and sometimes kept. The vowel /y/ is kept and combined with /er/, yielding /yer/ when the rhotic suffix is attached.

The nasals are deleted when the rhotic suffix is attached, as demonstrated by the following examples:

(94) *menr* 門兒 [məˠ], ‘door’ cf. SM *mén*

zhungr 盅兒 [t͡ʂʷəˠ], ‘handleless cup’ cf. SM *zhōng*

tier ger 調羹 [tʰʲəˠ.kəˠ], ‘spoon’ cf. SM *tiáogēng*

4 Suprasegmental phonology

In this section, the suprasegmental features of syllable length and tone are examined.

4.1 Reduced syllables

Syllable reduction is a characteristic of Gangou that may be considered a non-Sinitic phenomenon. Reduced (a.k.a. weak or light) syllables have been described also for Standard Mandarin (Duanmu 2000: 87–89). In Standard Mandarin, these are represented by syllables such as *fang* and *tou* in the words *dìfang* 地方 'place' and *mǔtou* 木頭 'wood'. Duanmu (2000) notes that weak syllables are shorter in duration than full syllables and that weak syllables could be represented as CV, while full syllables are CVV. In Gangou, reduced syllables are found more frequently than in Standard Mandarin, and they are not only found syllable-finally.

Gangou syllables can be divided into monomoraic and bimoraic syllables. The majority of Gangou syllables belong to the latter group. The former group consists of syllables of the type described above for Standard Mandarin, i.e. syllable-final, destressed syllables, and of syllables containing one of the vowels *i* or *u*, which can appear anywhere inside a word. The first type is represented by the syllable *shang* in the words *zo*^{24} *shang*^{5} [t͡sɔu̯˧.ʂə̃] 早上 'morning' and *tian*^{11} *shang*^{24} [tʰi̯ɛ̃˩.ʂɑ̃˧] 天上 'in the sky'. The second *shang* is pronounced normally with the vowel [ɑ̃] while the vowel of the first *shang*, which is reduced, has changed to [ə̃]. It is likely that reduced syllables have an effect on the tonal pattern of Gangou di- and polysyllabic words and phrases. This is a topic that requires further investigation.

The second type involves the vowels *i* and *u*. As explained in section 3.4.7, the vowels *i* and *u* tend to undergo vowel reduction when they occur as parts of a di- or polysyllabic word. When stressed or occurring in monosyllables, they are usually fully lengthened. Compare the syllable *fu* in the words *fu*^{35} 書 [fʊ̩˧˥] 'book' and *tu*^{1} *fu*^{1} *guan*^{55} 圖書館 [tʰʊ̩˩.fʊ̩˩.kʷæ˥] 'library'. The first *fu* is bimoraic, while the second, is monomoraic due to its position within a polysyllabic word. Vowel reduction of this kind may involve devoicing of the vowel when it follows an aspirated or fricative initial. Vowel devoicing has also been reported for Mangghuer (Slater 2003: 36–37).

As explained in section 2.1.3, monomoraic syllables are written with one tonal digit only while bimoraic syllables are written with two tonal digits. Below are some further examples of monomoraic syllables:

(95) *fu*[1] *yeu*[35] 富有 [fu̯˩.ju̯ɯ˦˥], 'rich, wealthy'

di[5] *ban*[11] *zhuan*[35] 地板磚 [tɻ̩˩.pæ̃˩.t͡ʂʷæ̃˦˥], 'floor tile'

In (95), the first syllables of each example are reduced, but reduced syllables can be found in other positions as well.

(96) *ku*[1] *dai*[55] *zi*[1] 褲帶子 [kʰu̯˩.tɛ˩.t͡sɻ̩˩], 'belt'

wu[1] *ming*[35] *zhi*[5] 無名指 [ṵ˩.mĩ˦˥.t͡ʂɻ̩˩], 'ring finger'

lo[35] *hu*[5] 老虎 [lɔu̯˦˥.xu̯˩], 'tiger'

hu[1] *du*[5] [xu̯˩.tṵ˩], 'very'

The nuclear vowels *a* and *e*, as well as the compound vowels *ai*, *ei*, *o*, and *eu*, are rarely reduced. Furthermore, *i* shows a greater tendency to become reduced than *u*. Reduction occurs more frequently after aspirated and fricative initials than after non-aspirated initials.

4.2 Tone

This section describes the tonal system of Gangou. In the present thesis, only monosyllables and disyllables are considered. It is shown that Gangou has three tones underlyingly, which are reduced to two in monosyllables. In sections 4.2.1 and 4.2.2, the tones are examined based on the tone system of Middle Chinese and compared with the tone system of Standard Mandarin. A summary of the tone system of Gangou is laid out in section 4.2.3.

The tonal analysis in this section is based on a categorization of Gangou syllables according to the tone system of Middle Chinese. This is based on the assumption that the tone system of modern Gangou is derived from the tone system of Middle Chinese. Similarly, the Standard Chinese tone system, with which Gangou is compared, is assumed to be derived from Middle Chinese. This means that each syllable of a given tone category is expected to have the same surface tone value as other syllables in the same category.

In Middle Chinese, there were four tones (A, B, C, D) and two registers (1, 2), which gives a total of eight tone categories (A1, A2, B1, B2 etcetera). (In Chinese, the tones are known as *ping* 平, *shang* 上, *qu* 去, and *ru* 入, while the two registers are called *yang* 陽 and *yin* 陰 respectively.) A1, B1, C1, and D1 are the tone categories of the upper (*yang* 陽) register while A2, B2, C2, and D2 are the tone categories of the lower (*yin* 陰) register. In Middle Chinese, the register contrast was related to voicing of the initial: syllables with a voiced onset belonged to the lower register while syllables with an unvoiced onset belonged to the upper register; in modern Mandarin varieties, which lack voiced initials, the contrast is tonal.

Standard Mandarin distinguishes four tones (excluding toneless syllables, which sometimes are regarded as a fifth tone): a high tone (tone 1), a rising tone (tone 2), a dipping tone (tone 3), and a falling tone (tone 4). As mentioned above, Gangou has three tones. Table 15 shows the correspondences between Middle Chinese, Standard Mandarin and Gangou tones.

Since Standard Mandarin has four tones and Gangou has three tones, it means that some of the Middle Chinese tones have been merged in these Sinitic varieties. This is the case in tone categories A and B. The registers of tone A (A1 and A2) are kept distinct in both Standard Mandarin and Gangou, while tones B1 and B2 as well as tones C1 and C2, as previously mentioned, have merged. The register contrast has been lost in these tone categories, so that the words 手 (B1) and 老 (B2) as well as 菜 (C1) and 累 (C2) have the same tone. Compare with Cantonese, which has preserved the register contrast:

	Syllable	Gangou	Standard Mandarin	Cantonese	
(97)	手 (B1):	*sheu*^{35} [ʂɯ˦˥]	*shǒu* [ʂoʊ̯˨˩˦]	*sau*^{35} [saʊ̯˦˥]	‘hand’
	老 (B2):	*lo*^{35} [lɔʊ̯˦˥]	*lǎo* [laʊ̯˨˩˦]	*lou*^{12} [lɔʊ̯˨˧]	‘old’
	菜 (C1):	*cai*^{55} [t͡sʰɛ˥]	*cài* [t͡sʰaɪ̯˥˩]	*coi*^{33} [t͡sʰɔːy˧]	‘food’
	累 (C2):	*lei*^{55} [li˥]	*lèi* [leɪ̯˥˩]	*leoi*^{22} [løy˨]	‘tired’

Tone category D includes syllables that end in a stop consonant /-k, -t, -p/ in Middle Chinese. In both Standard Mandarin and Gangou, stop endings have been lost and tone D syllables have subsequently been regrouped into one of the other categories. These syllables are still underlyingly D, but since stop endings have disappeared, they surface with the tone value of

one of the other tones. In both Standard Mandarin and Gangou, D syllables can have any of the tone values.

	Example	Gangou	Standard Mandarin	
(98)	戳 (D1):	*chue*^{35} [t͡ʂʰʷəˀ˥]	*chuō* [t͡ʂʰʷo˥]	‘to stab, kill’
	薄 (D2):	*bue*^{35} [pʷəˀ˥]	*báo* [paʊ̯ˀ˥]	‘thin’
	窄 (D1):	*zhai*^{35} [t͡ʂɛˀ˥]	*zhǎi* [t͡ʂaɪ̯˨˩˦]	‘narrow’
	熱 (D2):	*re*^{35} [ɻəˀ˥]	*rè* [ɻə˥˩]	‘hot’

4.2.1 Monosyllables

In this section, the tones of monosyllabic words are examined. Monosyllable here refers to words spoken in isolation or as the final syllable of an utterance, not followed by any other lexical or grammatical element.

As previously mentioned, Gangou has three tones underlyingly. In monosyllables, however, there are only two surface tones: a low (L) and a high (H) tone. (The underlying tone of A1 and B syllables is /11/, as shown in section 4.2.2.) The L tone starts low and rises and is very similar to the Standard Mandarin rising tone (tone 2). The H tone is high and slightly shorter in duration than the L tone. It resembles the Standard Mandarin high tone (tone 1), but it is shorter and more abrupt.

The following examples are reading pronunciations:

(99)	*tang*^{35} 湯 [tʰɑ̃ˀ˥], ‘soup’	cf. SM *tāng* (A1)
	tang^{35} 糖 [tʰɑ̃ˀ˥], ‘sugar’	cf. SM *táng* (A2)
	tang^{35} 躺 [tʰɑ̃ˀ˥], ‘lie down’	cf. SM *tǎng* (B)
	tang^{55} 燙 [tʰɑ̃˥], ‘hot’	cf. SM *tàng* (C)

In (99), it is shown that the H tone often corresponds to tone 4 in Standard Mandarin (tone category C), while the L tone corresponds to the other three tones.

We can thus posit that syllables belonging to tone categories A and B have a rising tone in Gangou monosyllables, while tone C syllables have a high tone:

(100)	Example	Gangou	Standard Mandarin
	花 (A1):	*hua*^{35} [xʷa˥]	*huā* [xʷa˥]
	閒 (A2):	*huan*^{35} [xʷæ̃˧]	*xián* [ɕi̯ɛ̃(n)˧]
	短 (B):	*duan*^{35} [tʷæ̃˧]	*duǎn* [tʷã(n)˨˩]
	厚 (C):	*heu*^{55} [xɯ˥]	*hòu* [xɔu̯˥˩]

Minimal pairs of monosyllabic words that differ only with respect to tone are readily found in the vocabulary. In (101), the words in the left column have the L tone. These are contrasted with the H tone words to the right:

(101)		
	hua^{35} 花 [hʷa˧], ‘flower’	*hua*^{55} 話 [hʷa˥], ‘speech’
	sheu^{35} 手 [ʂɯ˧], ‘hand’	*sheu*^{55} 瘦 [ʂɯ˥], ‘thin, slim’
	kang^{35} 扛 [kʰɑ̃˧], ‘to carry’	*kang*^{55} 炕 [kʰɑ̃˥], ‘heatable brick bed, *kang*’
	nue^{35} 鵝 [nʷə˧], ’goose’	*nue*^{55} 餓 [nʷə˥], ‘to be hungry’

Tone can be used to distinguish verbs from nouns, as in the following example:

(102)	
	ding^{35} 釘 [tʲĩ˧], ‘nail, spike’
	ding^{55} 釘 [tʲĩ˥], ‘to drive in a nail’

The tonal correspondence between Standard Mandarin and Gangou mostly holds true in monosyllables belonging to tone categories A, B, and C. Standard Mandarin tones 1, 2, and 3 are thus often rising in Gangou, while tone 4 corresponds to the high tone, as shown in table 15. The D group, however, has developed differently in Gangou and Standard Mandarin. Many D syllables that have tone 4 in Standard Mandarin have the low tone in Gangou. The following examples are compared with Cantonese, which has retained D syllables as a category in the modern language. This is evident from the stop ending *-k* in the examples below:

(103) *lu*[35] 鹿 [ɬu˥], ‘deer’ Cant. *luk*, SM *lù*

liu[35] 六 [lʲʉ˥], ‘six’ Cant. *luk*, SM *liù*

yue[35] 藥 [jʷɐ˥], ‘medicine’ Cant. *joek*, SM *yào*

However, counterexamples can be found. [11]

(104) *ke*[55] 渴 [kʰə˧], ‘to be thirsty’ Cant. *hot*, SM *kě*

gei[55] 給 [ki˧], ‘give Cant. *kap*, SM *gěi*

There are a few inconsistencies in the data that seem to be pure exceptions, such as the word *qi*[1] *che*[55] [tɕʰi̯ɻ.tʂʰə˧] ‘car’, for which the expected surface realization is *qi*[5] *che*[11] [tɕʰi̯ˀ.tʂʰəɻ]. Others are pronounced the same way as in Standard Mandarin rather than according to its expected reflex in Gangou, as in the word *xing*[55] *qi*[1] ‘week’, for which the expected reflex is *xing*[11] *qi*[5].

(105) *qi*[1] *che*[55] 汽車 [tɕʰi̯ɻ.tʂʰə˧], ‘car’ SM *qìchē*

xing[55] *qi*[1] 星期 [ɕĩŋ˧.tɕʰi̯ɻ], ‘week’ SM *xīngqi*

4.2.2 Disyllables

In disyllabic words and phrases, three tones are distinguished, a low (L) tone, a rising (R) tone, and a high (H) tone, as illustrated by the following example:

(106) *kuangzi* 筐子 /khuaŋ11 ts5/ [kʰʷɑ̃ŋɻ.t͡sɻ˧], ‘basket’

heuzi 猴子 /xeu35 ts5/ [xɯ˥.t͡sɻ˧], ‘monkey’

tungzi 筒子 /thuŋ11 ts5/ [tʰũŋɻ.t͡sɻ˧], ‘bucket’

zhungzi 種子 /tsruŋ55 ts1/ [t͡ʂũŋ˧.t͡sɻɻ], ‘seed’

[11] The examples in (103) are D2 syllables while the examples in (104) are D1, which may point to the register contrast having been kept in Gangou in the D category. More examples are needed to determine whether this is a coincidence or whether there is in fact a register contrast.

In monosyllables, tones A and B were grouped together while tone C remained distinct, as seen in section 4.2.1. (106) shows that in disyllables, tones A1 and B have been grouped together while A2 is distinct. Next, the three tones are described in turn. In section 4.2.2.1, the tones described are those of the word-initial syllable. Word-final syllables are described in section 4.2.2.2.

4.2.2.1 Word-initial syllables

The low tone. The L tone corresponds to the Middle Chinese tones A1 and B (Standard Mandarin tones 1 and 3). It is a low, level tone with the tone value /11/. In (107), some reflexes of tone A1 in Gangou are shown:

(107) *gan*^{11} *geu*^{35} 甘溝 [kæ̃˩˧.kɯ˥˩], 'Gangou'

hua^{11} *ping*^{35} 花瓶 [xʷa˩˧.pʰĩ˥˩] 'vase'

qing^{11} *hai*^{55} 青海 [tɕʰiŋ˩˧.xɛ˥˩], 'Qinghai'

wan^{11} *deu*^{55} 豌豆 [ʋæn˩˧.tɯ˥˩], 'pea'

Below are some reflexes of tone B (Standard Mandarin tone 3) in Gangou:

(108) *lo*^{11} *ying*^{35} 老鷹 [lɔu̯˩˧.jĩ˥˩], 'eagle'

ny^{11} *ren*^{35} 女人 [nj̩ʷ˩˧.ɻ̃˥˩] 'woman'

lo^{11} *ban*^{55} 老闆 [lɔu̯˩˧.pæ̃˥˩], 'boss'

mi^{11} *fan*^{55} 米飯 [mj̩˩˧.fæ̃˥˩] 'cooked rice'

Apart from A1 and B, the L tone sometimes corresponds to A2. The expected tone value of A2 syllables in Gangou is /35/. I have no explanation for why some A2 syllables sometimes surface with the L tone, and these are therefore regarded as exceptions at the present stage. The following syllables (*niu, men, pin*) have the unexpected surface realization /11/:

(109) *niu*^{11} *nai*^{35} 牛奶 [nʲɯ˩˧.nɛ˥˩], '(cow's) milk'

men^{11} *keu*^{35} 門口 [mɨ̃ŋ˩˧.kʰɯ˥˩], 'doorway'

pin^{11} *qun*^{35} 貧窮 [pʰĩn˩˧.t͡ɕʰỹ˥˩], 'poor'

As mentioned in section 4.2.1, tone D syllables often surfaces with a L tone in Gangou. Compare with Cantonese, which has preserved the stop endings of Middle Chinese:

(110) *mi*[11] *feng*[35] 蜜蜂 [mi̯˩˧.fə̃˥], 'bee' Cant. *mat*[1] *fung*[55]

ri[11] *teu*[35] 日頭 [ɻi̯˩˧.tʰɯ˥], 'sun' Cant. *jat*[1] *tau*[35]

gu[11] *teu*[35] 骨頭 [kʊ̯˩˧.tʰɯ˥] 'bone' Cant. *gwat*[5] *tau*[11]

ke[11] *fei*[55] 瞌睡 [kʰə˩˧.fi˥] 'to feel sleepy' Cant. *hap*[5] *seoi*[11]

The rising tone. The R tone has the tone value /24/ or /35/; it starts a little above the bottom of the vocal range, rises and stops somewhat before the top of the vocal range. It most often corresponds to the A2 tone of Middle Chinese, which is also a rising tone in Standard Mandarin, very similar to its Gangou equivalent:

(111) *she*[35] *zi*[5] 蛇子 [ʂə˥.t͡sɻ̩˥], 'snake'

nung[35] *geng*[55] 農耕 [nũŋ˥.kɪ̃˥], 'agriculture'

mo[35] *niu*[55] 氂牛 [mɔu̯˥.nʲɯ˥] 'yak'

yang[35] *yu*[55] 洋芋 [jɑ̃ŋ˥.ʐ̩ʷ˥] 'potato'

Sometimes also A1 and B syllables can surface with the R tone. It is suggested in section 4.2.2.2 that this may be an allophonic variant of the L tone occurring in A1 and B syllables:

(112) *jo*[35] *wang*[55] 交往 [t͡ɕɔu̯˥.vɑ̃˥], 'partner, friend'

zhu[35] *zi*[5] 珠子 [t͡ʂʊ̯˥.t͡sɻ̩˥] 'pupil (of the eye)'

shui[35] *gue*[55] 水果 [ʂʷi˥.kʷə˥], 'fruit'

ma[35] *yi*[55] 螞蟻 [ma˥.ʐ̩˥], 'ant'

There are no examples where a syllable belonging to tone category C carries the R tone. Some tone D syllables, however, surface with the R tone in Gangou. In Standard Mandarin, some of these syllables have the falling tone (tone 4), whose expected equivalent in Gangou is the H

tone. The following examples thus show that tone D syllables have developed differently in Standard Mandarin and Gangou:

(113) *mai*[35] *zi*[5] 麥子 [mɛ˦˥.t͡sɻ˩], 'wheat'

chu[35] *sheng*[55] 畜生 [t͡ʂʰʊ˦˥.ʂə̃˩], '(domestic) animal'

ya[35] *zi*[5] 鴨子 [ja.t͡sɻ] 'duck'

she[35] *teu*[55] 舌頭 [ʂə.tʰɯ] 'tongue'

The H tone. The H tone almost exclusively carried by tone C syllables, which in Standard Mandarin have tone 4. The H tone is high, level and usually shorter in duration than the other two tones. It has a falling allotonic variant /52/ which sometimes occurs utterance-finally. There seems to be some speaker variation as to whether the H tone is pronounced as /55/ or /52/ in this position. Below are some examples of tone C syllables in Gangou:

(114) *tu*[55] *zi*[1] 兔子 [tʰʊ.t͡sɻ], 'rabbit'

zi[55] *niu*[11] 牸牛 [t͡sɻ.nʲɯ], 'cow'

zang[55] *zu*[11] 藏族 [t͡sɑ̃.t͡sʊ], 'Tibetan, the Tibetan ethnic group'

zo[55] *hue*[11] 灶火 [t͡sɔu̯.xʷə], 'kitchen, cooking stove'

Some tone B syllables surface with a H tone in Gangou. It is not clear at present why these syllables have the H tone rather than the expected L tone, and they are therefore regarded as exceptions:

(115) *lo*[55] *shi*[1] 老師 [lɔu̯˩.ʂɻ˩], 'teacher'

ke[55] *yi*[1] 可以 [kʰə˩.ʐɻ˩], 'can, may'

sheu[55] *du*[11] 首都 [ʂɯ˩.tʊ˩], 'capital city'

hai[55] *xi*[1] 海西 [xɛ˩.ɕʐɻ˩], 'Haixi'

4.2.2.2 Word-final syllables

In this section, the tones of word-final syllables are described. Unlike Standard Mandarin, Gangou frequently exhibits tonal dissimilation in disyllabic words and phrases. This means that the tone of the second syllable is usually different from that of the first syllable and that the underlying tonal value of a syllable is changed in word-final position. The following words containing two syllables of the same underlying tone category are compared with Standard Mandarin, where there is a dissimilation rule only when a tone 3 syllable is followed by another tone 3 syllable ('tone 3 sandhi'), as in the word *laoban* 'boss' below:

	Gangou	Standard Mandarin
(116)	*fei*^{11} *ji*^{55} [fi.t͡ɕʑ]	*fei*^{55} *ji*^{55} 飛機, 'airplane'
	qun^{35} *ren*^{55} [t͡ɕʰỹnɬ.ɻ̃ĩ˥]	*qiong*^{35} *ren*^{35} 窮人, 'poor people'
	lo^{11} *ban*^{55} [lɔu̯˩.pæ̃˥]	*lao*^{35} *ban*^{214} 老闆, 'boss'
	hai^{55} *pa*^{11} [xɛ˥.pʰa˩]	*hai*^{52} *pa*^{52} 害怕, 'to fear'

The examples in (116) above, demonstrate that the second tone in a disyllabic word tends to be neutralized in word-final position and is often either /55/ or /11/, irrespective of the underlying tone value of the syllable in question. The tone of the second syllable is conditioned by tone of the first syllable in the following way: L and R tones are followed by a H tone, while H tones are followed by a L tone.

The L tone can sometimes be followed by a R tone, especially utterance-finally. Compare the following examples containing the perfective particle *-lio*. It has the tone value /55/ when following a R or a H tone, and /35/ when following a L tone:

(117) *hue*^{11}*-lio*^{35} 喝了 [xʷə˩.lʲɔu̯ɬ], 'has drunk'

lai^{35}*-lio*^{55} 來了 [lɛ˩.lʲɔu̯ɬ], 'has come'

ho^{11}*-lio*^{35} 好了 [xɔu̯˩.lʲɔu̯ɬ], 'has become good, has recovered'

jian^{55}*-lio*^{11} 見了 [t͡ɕæ̃˥.lʲɔu̯˩], 'has seen'

A word-final R tone is especially common when the second syllable is underlyingly A2. In other words, A2 syllables almost always preserve their underlying tone value in word-final position when following a L tone.

(118) *sen*[11] *lin*[35] 森林 [sɨ̃nꜘ.lĩ˦˥], 'forest'

fang[11] *yan*[35] 方言 [fɑ̃ꜘ.jæ̃˦˥], 'dialect'

cung[11] *ming*[35] 聰明 [t͡sʰũꜘ.mĩ˦˥], 'intelligent, clever'

jo[11] *liu*[35] 交流 [t͡ɕɔu̯ꜘ.lʲɯ˦˥], 'communication; to communicate'

Similarly, D syllables tend to surface with a R tone in word-final position (one exception is *bo*[35] *gu*[5] 包穀 [pɔu̯˦˥.kʊ̩˥] 'maize':

(119) *qian*[11] *bi*[35] 鉛筆 [t͡ɕʰæ̃ꜘ.pz̩˦˥], 'pencil'

chun[11] *jie*[35] 春節 [t͡ʂʰũ.t͡ɕe], 'Chinese New Year'

li[11] *wu*[35] 禮物 [lz̩ꜘ.ʊ˦˥], 'gift'

A1 syllables are the most ambiguous case, since they sometimes surface as /55/ and sometimes as /35/ in word-final position. It should be noted that many of these syllables do not have an equivalent in the A2 category. In (120) below, the word-final syllables *geu*, *zhang*, and *jing* are only found in the A1 category (*yin* in the last example, on the other hans, is found in both categories). For example, Standard Mandarin does not have the syllables **góu*, **zháng* or **jíng* (=*gou*[35], *zhang*[35], *jing*[35]), only *gōu*, *zhāng*, and *jīng* (=*gou*[55], *zhang*[55], *jing*[55]). This may point to /35/ being an allotonic variant of /55/ in word-final A1 syllables.

(120) *gan*[11] *geu*[35] 甘溝 [kæ̃ꜘ.kɯ˦˥], 'Gangou'

nie[11] *zhang*[35] [nʲeꜘ.t͡ʂɑ̃˦˥], 'poor'

nian[11] *jing*[35] 眼睛 [nʲæ̃ꜘ.t͡ɕĩ˦˥], 'eye'

sheng[11] *yin*[35] 聲音 [ʂɨ̃ŋꜘ.jĩ˦˥], 'sound'

A few words have been found where a B syllable surfaces as /35/ in word-final position:

(121) *men*[11] *keu*[35] 門口 [mɨ̃ŋ˩.kʰɯ˧], ‘doorway’

niu[11] *nai*[35] 牛奶 [nʲɯ˩.nɛ˧], ‘cow’s milk’

tu[11] *yu*[35] 土語 [tʰʮ˩.ʐ̩ʷ˧], ‘Monguor language’

C syllables never occur with the R tone in word-final position. It thus seems that syllables belonging to the tone categories A, B, and D can surface as either /55/ or /35/ following a L tone syllable, while C syllables are always /55/ in this position. The reason for the variation among non-C syllables is not clear at the present moment and more research is needed to determine whether the contrast is allotonic or whether it is due to other factors, such as stress or tone deletion.

Below are the most common tone sequences found in Gangou disyllabic words:

(122) L-R *gan*[11] *geu*[35] 甘溝 [kæ̃˩.kʉ˧], ‘Gangou’

L-H *ke*[11] *fei*[55] 瞌睡 [kʰə˩.fi˥] ‘to feel sleepy

R-H *fang*[35] *zhue*[55] 方桌 [fɑ̃˧.t͡ʂʷə˥] ‘table’

H-L *pan*[55] *wang*[11] 盼望 [pʰæ˥.ʋɑ̃˩] ‘to hope for; to long for’

To summarize, if the second syllable is A, B or D, and the first syllable is anything other than C, the expected tone sequence is L-R (11-35) or L-H (11-55). If the second syllable is C, and the first syllable is not C, the expected tone sequence is L-H (11-55). If the first syllable is A2, the expected tone sequence is R-H (35-55). If the first syllable is C, the expected tone sequence is H-L (55-11).

The above tone sequences are the most frequently occurring tone sequences found in the data. However, there are exceptions. Tone dissimilation sometimes fails to apply for reasons that are not known at present, especially in reading pronunciations. The following examples are reading pronunciations:

(123) *fang*[35] *che*[35] 紡車 [fɑ̃˧.t͡ʂʰə˧], ‘spinning wheel’ (also pronounced *fang*[11] *che*[35])

ji[35] *nai*[35] 擠奶 [t͡ɕʐ̩˧.nɛ˧], ‘to milk (a cow etc.)’

heu[55] *shang*[55] 後晌 [xɯ˥.ʂɑ̃˥], ‘evening’

shen[55] *zang*[55] 腎臟 [ʂɨ̃˥.t͡sɑ̃˥], ‘kidney’

4.2.3 Summary of Gangou tones

To summarize, there are two tones in monosyllabic words and three tones in disyllabic words and phrases in Gangou. Below is a table showing the correspondences between Standard Mandarin and Gangou tones.

Standard Mandarin tone	Gangou tone	Example in Gangou
1	11 35	*gung*[11] *jir*[55] 公鷄兒 [kũŋ˩.t͡ɕɐ˥], ‘cock, rooster’ *dung*[35] *tian*[55] 冬天 [tũŋ˧.tʰʲɛ̃˥], ‘winter’
2	35	*mo*[35] *niu*[55] 氂牛 [mɔu̯˧.nʲɯ˥], ‘yak’
3	11	*lo*[11] *ying*[35] 老鷹 [lɔu̯˩.jĩ˧], ‘eagle’
4	55	*mian*[55] *bo*[11] 麵包 [mʲɛ̃˥.pɔu̯˩], ‘bread’

Table 15: Correspondence between Standard Mandarin and Gangou tones.

Standard Mandarin tone 1 can correspond to either /11/ or /35/ in Gangou. /11/ is the most common reflex, while /35/ is thought to be an allophonic variant occurring mostly in syllables that do not have any equivalent in the A2 category (the syllable *dung* in the table above does not exist in category A2). Standard Mandarin tones 2 and 3 mostly correspond to the Gangou tones /35/ and /11/ respectively, although there is some variation. Standard Mandarin tone 4 corresponds to the tone /55/, except when the syllable is underlyingly D, in which case it surfaces as either /11/ or /35/ in Gangou.

Below are the tone systems of some Amdo Sinitic languages for comparison. As mentioned in section 1, Xining belongs to the Xining group (tonal data from Dede 2006) while Xunhua belongs to the Xunhua group (tonal data from Zhang 1984). As for Gangou and Tangwang (tonal data from Xu 2017), the tones given are those of the first syllable in disyllabic words. Wutun has lost tones and is therefore not included in the table (Sandman 2016):

Dialect / Tone	Standard Mandarin	Xining	Xunhua/Ledu	Tangwang	Gangou
A1	55	55[12]	35	11	11/35
A2	35	35		35	35
B	214	53	53	11	11
C	53	11	55	35	55

Table 16. Tone systems of some Amdo Sinitic languages.

5 Conclusions

According to Janhunen (2015: 123), when it comes to the phonology of the languages of the Amdo Sprachbund, "the extant languages of the Sprachbund represent either a Bodic or a Sinitic orientation." As this thesis has shown, the phonology of Gangou clearly exhibits a Sinitic orientation, especially when it comes to the phonemic inventory which has been shown to be rather close to that of Standard Mandarin and other Mandarin varieties. Gangou also has a CMVF syllable structure, which is typical of Sinitic (some Amdo languages of the Bodic type have initial clusters due to the presence of a preinitial slot, which is not present in Gangou).

However, non-Sinitic traits can be found as well. As for the phonemic inventory, such aberrant features from a Sinitic point of view are found mostly in the vowel system. The most salient difference from Standard Mandarin is vowel reduction, which can be divided into two types: the monophthongization of Standard Mandarin diphthongs and the spirantization, shortening and occasional devoicing of the vowels *i, u,* and *y.* As for the former type, it is unclear whether it could be considered a Bodic, or perhaps Altaic, feature or not. The latter type of vowel reduction entails syllable reduction, which turns fully lengthened syllables into

[12] For the sake of conformity, the tone transcriptions in the original sources have been modified according to the following principle: 55=high tone, 11=low tone, 35=rising tone, 53=falling tone, 214=dipping tone. Dede (2006) and Zhang (1984) use "tone letters"; these have been transliterated into numerical values. The Xunhua/Ledu tone A1/A2 is represented by the tone letter [˨], i.e. /13/, in Zhang (1984). The change from /13/ to /35/ in the table might seem like a radical modification, but since there is no other contrasting rising tone in Xunhua or Ledu, the fact that it may be phonetically lower than /35/ is irrelevant here. Xu (2017) writes /24/ instead of /35/ for Tangwang.

short, monomoraic, sometimes voiceless, syllables, a phenomenon which seems to be a non-Sinitic (Bodic or Altaic?) characteristic of Gangou.

Another non-Sinitic trait is the reduced tonality of Gangou compared to Mandarin varieties in other parts of China. Additional research is needed to determine the exact nature of the Gangou tone system, but it is clear that it shows similarities with other Amdo Sinitic varieties: it consists of maximally three tones (possibly only two, if the contrast between the low tone and the rising tone turns out to be allophonic), and there is extensive tone neutralization in non-initial syllables. Stress (and possible ensuing tonal reduction) may play an important role in the prosodic system of Gangou. Furthermore, it is likely, as has been shown for Tangwang (Xu 2017), that the tones of Hui speakers differ from those of non-Hui speakers, and so this is another area that requires further investigation.

Appendix

This appendix provides an overview of the transcription system, the underlying representation and the pronunciation of the phonemic inventory of Gangou.

Gangou consonants:

Consonant graph	Phoneme	IPA value	Consonant graph	Phoneme	IPA value
b	/p/	[p]	*m*	/m/	[m]
p	/ph/	[p^h]	*n*	/n/	[n]
d	/t/	[t]	*r*	/r/	[ɻ]
t	/th/	[t^h]	*l*	/l/	[l]
g	/k/	[k]	*h*	/x/	[x]
k	/kh/	[k^h]	*y*	/i/	[j]
s	/s/	[s]	*yu*	/y/	[j^w]
z	/ts/	[$\widehat{ts}$]	*w*	/u/	[ʊ]
c	/tsh/	[$\widehat{ts}^h$]	*f*	/f/	[f]
x	/si/	[ɕ]			
j	/tsi/	[$\widehat{tɕ}$]			
q	/tshi/	[$\widehat{tɕ}^h$]			
sh	/sr/	[ʂ]			
zh	/tsr/	[$\widehat{tʂ}$]			
ch	/tshr/	[$\widehat{tʂ}^h$]			

Gangou vowels:

Vowel graph	Phoneme	IPA value	Vowel graph	Phoneme	IPA value
a	/a/	[a]	*ai*	/ai/	[ɛ]
e	/e/	[ə]	*o*	/au/	[ɔ̯ʊ̯]
i	/i/	[ʐ̩~ʑ̩]	*ei*	/ei/	[i]
	/-/	[ʐ̩]	*eu*	/eu/	[ɯ]
	/-/	[ʐ̩]			
u	/u/	[ʊ̩]			
y	/y/	[$ʑ̩^w$~$ʐ̩^w$]			

Gangou medials:

Medial	Orthographic example	Underlying representation	IPA value
/i/	*lia*	/lia/	[lʲa]
	lie	/lie/	[lʲe]
	lio	/liau/	[lʲɔu̯]
	liu	/lieu/	[lʲɯ]
	ja	/tsia/	[t͡ɕa]
	je	/tsie/	[t͡ɕe]
	jo	/tsiau/	[t͡ɕɔu̯]
	jeu	/tsieu/	[t͡ɕɯ]
/u/	*hua*	/xua/	[xʷa]
	hue	/xue/	[xʷə]
	huai	/xuai/	[xʷɛ]
	hui	/xuei/	[xʷi]
/y/	*lye*	/lye/	[lu̯e]*
	xue	/sye/	[ɕʷe]

*this example was not recorded

Gangou finals:

Final	Orthographic example	Underlying representation	IPA value
/an/	*kan*	/khan/	[kʰæ̃]
/aŋ/	*kang*	/khaŋ/	[kʰɑ̃]
/eN/	*pen/peng*	/pheN/	[pʰɪ̃]
/iN/	*lin/ling*	/liN/	[lĩ]
/uN/	*zhung*	/tsruN/	[t͡ʂũ]
/yN/	*lun*	/lyN/	[lỹ]

References

Chan, Yee-Shun A. 2006: *A Reconstruction of Late Middle Chinese.* Ph.D. dissertation, University of Hong Kong.

Chao, Yuan-ren 1968: *A Grammar of Spoken Chinese.* Berkeley: University of California Press.

Chappell, Hilary 2001. Language contact and areal diffusion in Sinitic languages. In Aikhenvald, Alexandra Y. and R.M.W. Dixon (eds.), Areal Diffusion and Genetic Inheritance: Problems in Comparative Linguistics. Oxford: Oxford University Press, 328-357. Dede, Keith R. S. 2003: The Chinese Language in Qinghai. *Studia Orientalia* 95, 321–346.

Dede, Keith R. S. 2006: Standard Chinese and the Xining Dialect. The Rise of an Interdialectal Standard. *Journal of Asian Pacific Communication* 16:2, 319–334.

Duanmu, San 2000: *The Phonology of Standard Chinese.* Oxford: Oxford University Press.

Dwyer, Arienne 1992: Altaic elements in the Línxià dialect. Contact-Induced Change on the Yellow River Plateau. *Journal of Chinese Linguistics* 20 (1), 160–178.

Dwyer, Arienne 1995: From the Northwest China Sprachbund: Xunhua Chinese dialect data. *Yuen Ren Society Treasury of Chinese dialect data*. Vol. 1, 148–182.

Feng, Lide and Kevin Stuart 1992. *Interethnic Contact on the Inner Asian Frontier: The Gangou People of Minhe County, Qinghai*. Sino-Platonic Papers 33. Philadelphia PA: Department of Oriental Studies, University of Pennsylvania.

Janhunen, Juha 2006: Sinitic and Non-Sinitic Phonology in the Languages of Amdo Qinghai, in Christoph Anderl & Halvor Eifring (eds.): *Studies in Chinese Language and Culture.* Festschrift in Honour of Christoph Harbsmeier on the Occasion of his 60th Birthday. Oslo: Hermes Academic Publishing, 261–268.

Janhunen, Juha 2012. On the hierarchy of structural convergence in the Amdo Sprachbund. In Pirkko Suihkonen, Bernard Comrie and P. Solovyev (eds.): *Argument Structure and Grammatical Relations: A Cross-Linguistic Typology*. Amsterdam: John Benjamin's, 177–189.

Janhunen, Juha 2015. Describing and transcribing the phonologies of the Amdo Sprachbund. In Gerald Roche, Keith Dede, Fernanda Pirie and Benedict Copps (eds.): *Centering the Local*. A Festschrift for Dr. Charles Kevin Stuart on the Occasion of his Sixtieth Birthday. Asian Highlands Perspectives 37, 122–137.

Lee, Wai-Sum & Eric Zee 2016. Apical Vowels. In Rint Sybesma (ed.): *Encyclopedia of Chinese languages and linguistics* 1: 169–172. Leiden/Boston: Brill.

Peyraube, Alain 2017: On some endangered Sinitic languages spoken in Northwestern China. *European Review* 26:1, 130–146.

Sandman, Erika 2016: *A Grammar of Wutun*. Ph.D. Thesis, University of Helsinki, Department of World Cultures.

Slater, Keith W. 2001: Creolization, Borrowing, Bilingual Mixing, and Standardization in the Formation of the Qinghai-Gansu Sinitic Creole Varieties. Paper presented at the *34th International Conference on Sino-Tibetan Languages and Linguistics,* Kunming.

Slater, Keith W. 2003: *A Grammar of Mangghuer: A Mongolic language of China's Qinghai–Gansu Sprachbund*. Routledge Curzon Asian Linguistics Series. London and New York: Routledge Curzon.

Xu, Dan 2015: The Role of Geography in the Northwest China Linguistic Area. In Xu Dan & Fu Jingqi (eds.): *New studies of space and quantification in languages of China*, 57–73. Dordrecht: Springer.

Xu, Dan 2017: *The Tangwang Language: An Interdisciplinary Case Study in Northwest China*. Cham: Springer International Publishing AG.

Yang, Yonglong 2013: *Gangouhua de Yuxu Leixing* 甘沟话的语序类型 [Word order in Gangou Chinese dialect]. *Minzu Yuwen* 6: 15–30.

Yang, Yonglong 2014a: *Qinghai Minhe Gangouhua de Duo Gongneng Ge Biaoji "ha"* 青海民和甘沟话的多功能格标记"哈" [The multi-functional case marker -xa in Gangou Chinese Dialect in Minhe Hui and Monguor County, Qinghai Province]. *Fangyan* 3: 230-351.

Yang Yonglong 2014b: *Qinghai Gangouhua Fushu Biaoji "mu" de Leixing Tezheng ji Lishi Bijiao* 青海甘沟话复数标记"们 [mu]"的类型特征及历史比较 [The typological feature and a diachronical comparison study of the plural marker -mu in Gangou dialect of Qinghai province]. *Lishi Yuyan Xue Yanjiu* 8, 239–254.

Yang Yonglong 2015: *Qinghai Gangouhua de Fansheng Lingshu Biaoji "nang" – "Zhuanyong Daozhi de Ganrao" de Gean Yanjiu* 青海甘沟话的反身领属标记"囊"——"转用导致的干扰"的个案研究 [The reflexive possessive marker -nang in Gangou Chinese dialect

in Qinghai province: a case of shift-induced interference in language contact]. *Yuyan Yanjiu* 35:3, 48–56.

Yang Yonglong & Zhang Jingting 2016: *Qinghai Minhe Gangouhua de Ge Biaoji Xitong* 青海民和甘沟话的格标记系统 [Case-marking system in Gangou Chinese Dialect in Qinghai province]. *Minzu Yuwen* 5, 25–38. Beijing.

Yang Yonglong & Zhang Jingting 2017: *Qinghai Minhe Gangouhua de Zhuangyu Congju Biaoji "shi" ji qi Laiyuan* 青海民和甘沟话的状语从句标记"是"及其来源 [The adverbial subordinate clause marker -shi and its origin in Gangou dialect of Qinghai province]. *Yuwen yanjiu* 2, 53–59.

Yip, Moira 2002: *Tone.* Cambridge: Cambridge University Press.

Zhang, Chengcai 1984: *Qinghai Sheng Hanyu Fangyan de Fenqu* 青海省漢語方言的分區 [The Classification of the Chinese Dialects of Qinghai Province]. *Fangyan* 3: 186–196.

Zhao Lüyuan 2015: *Gangou Fangyan de Dongci Houfu Chengfen – Jianlun Jiechu Beijing Xia de Shiti Xitong* 甘溝方言的動詞後附成分——兼論接觸背景下的詩體系統 [Post-Verb Supplementaries of Gangou Dialect and the Tense-Aspect System in a Language Contact Context]. MA thesis, University of Chinese Academy of Social Sciences.

Zhu Yongzhong, Üjiyediin Chuluu, Keith W. Slater and Kevin Stuart 1997: Gangou Chinese Dialect: a comparative study of a strongly altaicized Chinese dialect and its Mongolic neighbor. *Anthropos* 92, 433–450.