

Uvulars and uvularization in Tangut phonology

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Tangut, a mediaeval Qiangic language (Sino-Tibetan family) distinguishes three grades (*děng* 等). The traditional Sofronov-Gong reconstruction of this distinction postulates different degrees of medial yod: Grade I {-Ø-}, Grade II {-i-}, Grade III {-j-}. The yods, however, are not supported by the transcriptional evidence. Based on cognates between Tangut and Rgyalrongic languages, this study proposes the *uvularization hypothesis*: Tangut syllables have contrastive uvularization. Grade I/II syllables are uvularized, while Grade III syllables are plain. For phonological velars, uvularized syllables trigger a uvular allophone, while plain syllables trigger a velar allophone. Tangut uvularization is an instance of a common typological feature in Qiangic languages, that of GUTTURAL SECONDARY VOCALIC ARTICULATIONS (GSVA), variously termed uvularization, velarization, tenseness, or RETRACTED TONGUE ROOT (RTR). Recognizing Tangut grades as a case of Qiangic GSVA has far-ranging potential consequences for Sino-Tibetan comparative linguistics.

Keywords: Tangut, Qiangic languages, uvularization, GUTTURAL SECONDARY VOWEL ARTICULATION

1. Reconstruction of Tangut phonology: State of the art

Tangut¹ is a mediaeval Sino-Tibetan language mainly attested in documents from the 11th to 13th centuries. It was spoken in the Western Xia empire, in modern-

1. Tangut characters are annotated with the number in Fanwen Li's dictionary, revised version (Fanwen Li 2008) and transcribed in Hwang-cherng Gong's reconstruction in curly braces. Here is an example: 𐰽₄₉₃₅ {ya^ʰ} 'needle'. However, in § 5, Tangut characters are noted in a revised transcription according to the uvularization hypothesis, followed by Hwang-cherng Gong's reconstruction in curly braces, thus: 𐰽₄₉₃₅ 'needle' ba^{ʰi} {ya^ʰ}. Dictionary numbers are omitted when the linguistic form of the words are not themselves in question.

day Northwestern China, although its closest kin, the modern Qiangic languages,² are spoken in the Tibetan part of modern-day Sichuan, where the Tanguts were said to have originated from (*New history of Tang*, fascicle 221, Ouyang & Song 1975: 6214–6215). Tangut is attested in a Chinese-type syllabic logographic script, “perhaps the most complicated system ever invented by a human mind” (Laufer 1916: 4), with about 6,000 unique characters, pervasive homophony, and an absence of any systematic means to encode phonological information. It is hardly surprising that the reconstruction of *vox tangutensis* took scholars more than a century of work, from Wylie’s recognition of the Tanguto-Sanscritica of the Juyongguan inscription (Wylie 1870), mistaken by him as Jurchen, to Hwang-cherng Gong’s widely accepted reconstruction, first published in Fanwen Li’s dictionary (1997).

The modern reconstruction of Tangut phonology³ is based on two major bodies of evidence: foreign transcription and the native phonological analysis contained in Tangut lexicographical literature.

Transcriptional evidence consists of three major sources, transcription from and to Chinese,⁴ transcription from Sanskrit,⁵ and transcription to Tibetan.⁶

2. Qiangic classification is less unproblematic than it seems, as the original criteria of a Qiangic language were of a typological character. Katia Chirkova (2012) challenged the notion of Qiangic as a genetic branch, by showing ways in which a language can areally acquire common Qiangic characteristics. Nevertheless, there is a core group, shown to be indeed closely related in Jacques (2014), which is called Northern Qiangic by Hongkai Sun (2001) and Macro-Rgyalrongic by Jacques (2014). This group includes at least Rgyalrongic, Qiang, Minyang, and Pumi. In this study, I retain the label “Qiangic” to minimize confusion, and cite only data from Rgyalrongic languages.

3. The introductory chapters of Nishida (1964: 1–14) and Sofronov (1968: 12–35) give an extensive discussion on the early history of Tangut research. Ying-chin Lin (2004) presents the contributions of Hwang-cherng Gong to the reconstruction of Tangut phonology. A general history of the decipherment and phonological reconstruction of Tangut remains to be written; it would be of great interest not only for Sino-Tibetan studies, but also for general epistemological and methodological questions. Readers of English might also find Imre Galambos’s recent general history of Tangut study (2015: 63–96), while not exclusively focused on linguistics, an illuminating companion.

4. In this study, transcriptions from Chinese are principally cited from Hwang-cherng Gong (1991), a study of Chinese proper names in the Tangut version of *Leilin* (齡齡 {*dji*¹*bo*³}) and occasionally also from the *New collection of parental kindness and filial piety* (慨慈孝傳 *Xinji cixiaozhuan*; Kepping 1990; Jacques 2007) and the *Tangut-Chinese dictionary* (Fanwen Li 2008). The only consistent source of transcription into Chinese is the Tangut-Chinese glossary *Pearl in the hand* (綴綴祿祿祿祿祿祿 {*mji*²*zar*¹ *ɲwu*¹*dzji*¹ *bju*¹*pja*¹*gu*²*nji*³}, 番漢合時掌中珠 *Fanhan heshi zhangzhongzhu*), for which I rely on Fanwen Li’s study (1994). In this study, I annotate Chinese syllables in Early Middle Chinese transcribed in a slightly modified version of Baxter’s (1992) system, notably with *o* changed to

These constitute the most direct evidence of what Tangut sounded like. There are, however, several major limitations to the data. Sanskrit mantras have reasonably uniform pronunciations across different mediaeval cultures,⁷ but they cover only a tiny portion of possible syllables, often written with Tangut characters specifically devised to transcribe Sanskrit mantras. Chinese and Tibetan, on the other hand, were extremely dialectally fractured. Mediaeval Hexi Chinese and mediaeval Northeastern Tibetan, varieties in contact with Tangut and bilingually spoken by Tanguts, left no direct modern descendants and must be reconstructed on a variety of evidence, including Tangut itself. In addition, Chinese and Tibetan cannot do justice to the entire phonological system of Tangut; vital distinctions are ignored, and often otherwise represented with a variety of orthographical devices, whose interpretation is in itself controversial.

On the other hand, native Tangut scholars left us with an impressive amount of lexicographical literature. Major extant dictionaries, especially *Wenhai* (文海 {*jwɪr²ɲjow²*}), *Tongyin* (通音 {*ɣiɛ²lɔw²*}, *Homophones*) and *Wuyin qieyun* (音韻彙編 {*ɲwə¹ɣiɛ²we²bju¹*}), reveal a consistent system of native phonological analysis. Under this system adopted from the contemporary Chinese phonological tradition of *dengyunxue* (等韻學), a Tangut syllable is phonetically transcribed by the means of *fanqie* (反切),⁸ and analyzed with an initial consonant (聲 *sheng*, 龍 {*ɣiɛ²*}) and a rhyme (韻 *yun*, 龍 {*bju¹*}).

Tangut initial consonants are reconstructed by Sofronov (1968) with *fanqie xilianfa* (反切系聯法), the procedure of partitioning into equivalence classes the

4, and medial *-j-* changed into *-i-*. The anachronistic transcription is only given for indicative value, and should not be understood as participating in the arguments.

5. Some recent studies on the transcription of Sanskrit into Tangut are Arakawa (2004) and Bojun Sun (2010). I cull my examples from the study of the *Mañjuśrīnāmāsamgīti* (真實名經 *Zhenshimingjing*) by Ying-chin Lin (2006).

6. The up-to-date study of Tibetan transcriptions of Tangut is the PhD thesis of Chung-pui Tai (2008). He classifies the extant transcription data into six different hands, numbered from A to F. This is important to us, as different hands employ different orthographical devices to represent unfamiliar Tangut sounds in the Tibetan alphabet. The transliteration of the Tibetan follows Wylie and EWTS. For the phonology of Old and Classical Tibetan, the stage of language behind the Tibetan script, cf. Hill (2010).

7. Tangut Buddhism (Solonin 2015) was originally of Chinese inspiration, with the Tibetan influence being later and pertaining to popular Buddhism. Given the foundational importance of Chinese conventions, visible from the spelling of Sanskrit mantras in Tangut, the Tangut pronunciation of Sanskrit mantras was probably filtered through a certain Tantric superset of Chinese phonology. The extent of this Chinese influence is a fruitful direction for further research.

8. The process by which the pronunciation of a syllable is indicated by two syllables: the *fanqie shangzi* (反切上字) indicating the onset, and *fanqie xiazi* (反切下字) indicating the rhyme. Applied to English, this method would phonetically gloss *rough* with *write + cuff*.

relation of shared initial reflected in *fanqie* spellings, devised in Li Chen's *Qieyunkao* 切韻考 (Chen 1884), written in 1842, in order to study the initial consonants of Early Middle Chinese. This laborious procedure, in conjunction with transcription and the initial categories in *Tongyin*, enables a fairly uncontroversial reconstruction of Tangut initial consonants. Table 1 shows the system of initial consonants proposed by Hwang-cherng Gong,⁹ whose interpretation is followed in this study.

Table 1. Tangut initials according to Hwang-cherng Gong

Voiceless stop/affricate	<i>p</i>	<i>t</i>	<i>ts</i>	<i>tʃ</i>	<i>k</i>
Aspirated stop/affricate	<i>ph</i>	<i>th</i>	<i>tsh</i>	<i>tʃh</i>	<i>kh</i>
Voiced stop/affricate	<i>b</i>	<i>d</i>	<i>dz</i>	<i>dʒ</i>	<i>g</i>
Nasal	<i>m</i>	<i>n</i>			<i>ŋ</i>
Voiceless fricative			<i>s</i>	<i>ʃ</i>	<i>x</i>
Voiced fricative			<i>z</i>	<i>ʒ</i>	<i>ɣ</i>
Approximant		<i>r l lh</i>			
Zero initial					•

Rhyme categories are 97 in the first tone (*ping* 平, 𐰚 {*jiiŋ*³}) and 86 in the second tone (*shang* 上, 𐰚 {*phju*²}), according to the dictionaries, making 105 distinct rhymes with tone disregarded. Directly assigning phonetic values to this amount of entities is essentially an arbitrary process. Efforts of Tangutologists, most importantly Hashimoto (1963), Sofronov & Kychanov (1963), Nishida (1964), Sofronov (1968) and Hwang-cherng Gong (1989a; 1994), gradually brought out classes of rhymes showing consistent shared properties. These classes, defined on the range of the whole syllable/rhyme, fall into dimensions of variation called here phonological categories.

In Hwang-Cherng Gong's reconstruction, these phonological categories are shown to determine the identity of a rhyme. In other words, a rhyme can be uniquely factored into membership in phonological categories. With a value supplied for each of these categories, the resulting reconstruction is a transparent, Cartesian product of the reconstructed values. The phonological categories of a

9. Hwang-cherng Gong (2003) implies the existence of a distinction between the initial *w*- and the zero initial with a rounded medial *·w*-, as well as the analogous distinction between the initial yod *j*- and the zero initial with a palatal initial in Grade III *j*-. These distinctions do not seem very solid, with values differing among Gong's writings and different versions of Fanwen Li's dictionary. Leaving a detailed solution to another study, I analyse such cases with the zero initial and write hence *·w*-, *j*-. See however §4.3.

Tangut syllable are as follows, given with their representation in Hwang-cherng Gong's reconstruction:

- tone: first tone (平 *ping*) and second (上 *shang*), represented as 1 and 2;
- retroflexion: present or absent, with presence represented as -*r*;
- tenseness: present or absent, with presence represented as dots under vowels: *Ȳ*;
- rhyme group: one among 9, if we discount the more marginal groups: *u*, *i/e*, *a*, *i/ə*, *ij/ej*, *ij/əj*, *iw/ew*, *o*, *ow*;
- vowel length: short and long vowels, represented as single and double vowel letters;
- grade (等 *deng*): I, II and III, represented as medials -Ø-, -*i*- and -*j*-. For rhyme groups with an allophony between the rhyme *i* ~ *e* or *i* ~ *ə*, the lower variants *e*, *ə* appear in Grades I/II, the higher variant *i*, *i* appear in Grade III.
- round medial: present (合口 *hekou*) or absent (開口 *kaikou*), with presence represented as -*w*-.

Hwang-cherng Gong's transcription of a Tangut character can be read as representing a collection of values among these categories. For example, {*džjiir*¹}, Gong's transcription of 𐞪₂₁₈₀ 'to abandon', represents the following combination of elements: initial consonant *dž-*, first tone, retroflexion present, tenseness absent, rhyme group *i/ə* (noted *i* after -*j*-), long vowel, grade III, round medial absent. This alphabetic representation of the phonological categories suggests a high level of phonetic concreteness. However, as Ying-chin Lin (2004:480) puts it, the phonological and phonetic reality of Gong's notation is open to further reinterpretation, for which purpose she estimates that "reliable information could be drawn from comparative Sino-Tibetan studies" (可以從漢藏語的比較研究汲取確實可靠的資訊).¹⁰

Indeed, Tangut is known to be a Qiangic language *avant la lettre* (Wolfenden 1931; Jingru Wang 1933; *contra* Laufer 1916). In contrast, the comparison between Tangut and modern Qiangic languages, however, was not feasible until recently. Hwang-cherng Gong's rigorous research on Tangut etymology (Gong 1995 *inter alia*, cf. collected essays in Gong 2002) focused on the ancient written languages of Chinese, Tibetan and Burmese, with which Tangut shares few certain cognates. On the other hand, the lexical comparison made by Hongkai Sun

10. Hwang-cherng Gong himself, in an interview conducted by Jackson T.-S. Sun (2004a), also stated that he was not certain of the precise phonetic value of retroflexion, tenseness, or length (Sun 2004a: 7–9). However, he believed in the reality of his reconstruction of Grade-III yod and cited his reconstruction of Tangut *-*j*- to support the reconstruction of *-*j*- in Old Chinese (Sun 2004a: 4–5, cf. also Gong 2007).

(2004) used Chinese phonetic glosses in the *Pearl in the hand* in lieu of modern reconstructions, and did not attempt to establish any phonetic regularities.

Over the past few decades, research on Qiangic languages, especially for the phonologically conservative Rgyalrongic languages, has known an exceptional vigor. A huge amount of lexical data are available now, while they were not in the 1990s. Guillaume Jacques, in particular, has recorded the vocabulary of Japhug Rgyalrong with a hitherto unparalleled exhaustiveness and ethnographical precision, now available in the form of a dictionary (2016). His work on Japhug formed the basis of his *Esquisse de phonologie et de morphologie historique du tangoute* (2014), in which he compared Tangut to several Qiangic languages, especially Japhug Rgyalrong, in a rigorous Neogrammarian framework. In this work, he identified more than 300 cognates, some of them quite non-obvious. Tangutologists are for the first time provided with a sizeable corpus of cognates upon which to develop and test hypotheses. This study provides an illustration of the largely untapped potential of Qiangic comparison in Tangut linguistics.

2. Grades in Tangut phonology

2.1 Establishing grades in Tangut

This study attempts to revise the phonological and phonetic interpretation of a particular phonological category: grades (等 *deng*). The existence of this category is hinted at in Hashimoto's short article (1963) on the ordering of rhymes in the dictionary *Wenhai*, and systematically reconstructed by Sofronov (1968; 1980). The reconstruction of grades is substantially improved by Hwang-cherng Gong (1994), whose treatment we follow in this section.

Syllables in different historical stages of Chinese are classified into four grades (等 *deng*), numbered I, II, III and IV. Grades actually designate a pair of related concepts:¹¹ Late Middle Chinese ranks (*yuntu deng* 韻圖等), a classification devised by Tang-Song period Chinese phonologists of the *dengyunxue* (等韻學) tradition, and Early Middle Chinese divisions (*zhonggu deng* 中古等), a categorization devised by Qing-period and contemporary scholars for Early Middle Chinese rhymes on the basis of ranks. The EMC division and LMC rank of a syllable often coincide with each other, a notable exception being EMC Division III rhymes, that contain syllables of Rank II (rare), III and IV. In this study, I intentionally refer to the ambiguous concept of grades, as the particular items on which EMC divisions and LMC ranks differ are peripheral to our interest. Grades are

11. See Ruiqing Shen (2017) for an up-to-date introduction on this subject.

cited with LMC rank in roman numbers, and, for EMC division III and IV syllables, with the EMC division in subscript. Grade IV₃, for example, refer to Chinese syllables with LMC rank IV and EMC division III.

The phonological and phonetic nature of Chinese grades are still fiercely debated by scholars, on which Tangut transcription itself offers valuable testimony. In order to avoid circularity, this study treat grades as abstract categories, with modern Chinese dialects and mediaeval transcriptions occasionally cited in order to argue against particular interpretations.

The establishment of Tangut grades relies on the following observation: Tangut rhymes are arranged in roughly homophonous groups in dictionaries. Rhymes in such a group, numbered x , $x+1$, $x+2$ or $x+3$, respectively transcribe roughly homophonous Chinese rhymes of Grades I, II, III/IV or III/IV. For example, Tangut rhymes R.34, R.35, R.36 and R.37 are all more or less indiscriminately transcribed as *-e* and *-i* in the Tibetan transcription (Chung-pui Tai 2008). In the corpus of Chinese proper names taken from the *Leilin* (Hwang-cherng Gong 1991), Tangut syllables from these rhymes transcribe the Chinese syllables shown in Table 2. We see here the clear correspondence between R.34 and Chinese Grade I, R.35 and Chinese Grade II, R.36 and R.37 with Chinese Grades III and IV.

There are also partially analogous groups of rhymes, for example R.41–R.43, which consist of only three members, with the last rhyme (R.43) transcribing all Chinese syllables of Grades III and IV. In contrast to Sofronov (1968; 1980), who reconstructed four Tangut grades in the first case, and three grades in the second, Hwang-cherng Gong has shown that there is no distinction between Grade III and IV in Tangut phonology. For example, as is shown in Table 3 (adapted from Gong 1989a), the rhymes R.36 and R.37 are in near-complementary distribution with regard to the classes of Tangut initials as is given by chapter numbers in *Tongyin*. The only exception is the character 𐞖₁₀₅₈ {*džjij*¹}, of initial *dž* but in rhyme R.37, not R.36 as expected. According to Hwang-cherng Gong (1989a), 𐞖₁₀₅₈ {*džjij*¹} is a *fanqie* character¹² composed of 𐞖₀₉₆₉ {*džjir*²} ‘butter’ and 𐞖₅₀₂₄ {*ljij*¹} ‘change’. As the second component of *fanqie*, 𐞖₅₀₂₄ {*ljij*¹}, has an *l*-initial, and hence belong to the rhyme R.37, consistency to the *fanqie* principle required a categorization into rhyme R.37, with no phonological substance.

To Gong’s analysis, we might add that for cases where there is a distinction between LMC Rank III and Rank IV, reflected in ‘Phags-pa Chinese (a 13th-

12. 𐞖₁₀₅₈ {*džjij*¹}, being a *fanqie* character, was considered in Hwang-cherng Gong (1989a) as used for transcription from Sanskrit, and glossed in Fanwen Li (2008) as “a transliteration”. In fact, all the examples in Fanwen Li (2008) concern proper names which contain the combination 𐞖₀₄₇₃ 𐞖₁₀₅₈ {*dow*¹*džjij*¹}, probably an important clan name among the Tanguts.

Table 2. Chinese syllables transcribed by Tangut characters in rhymes R.34–R.37

Tangut rhyme	Chinese grade (Rank _{division})	Chinese syllables
R.34 (1.33–2.30) Gong: {-ej}	I	Rhyme 哈 (-aj) 梅 <i>mwaɣ</i> 凱 <i>khajX</i> 開 <i>khaj</i> 才 <i>dzaɣ</i> 海 <i>xaɣX</i> 亥 <i>ɣajX</i> 臺 <i>daj</i> 崔 <i>tshwaɣ</i> 戴 <i>tajH</i> 愷 <i>khajX</i> 胎 <i>thaɣ</i> 裴 <i>bwaɣ</i> 回 <i>ɣwaɣ</i> Rhyme 泰 (-aj) 會 <i>kwajH</i> 蔡 <i>tshajH</i> 帶 <i>tajH</i> 太 <i>thajH</i> 大 <i>dajH</i> 泰 <i>thajH</i> 沛 <i>phaɣH</i>
	III ₃	Rhyme 脂 (-ij) 龜 <i>kwij</i>
R.35 (1.34–2.31) Gong: {-ieɣ}	II	Rhyme 皆 (-ej) 皆 <i>kej</i> 喈 <i>kej</i> 玠 <i>kejH</i> Rhyme 佳 (-e) 買 <i>mɛX</i> Rhyme 庚二 (-æŋ) 更 <i>kæŋ</i> 猛 <i>mæŋX</i> 孟 <i>mæŋH</i>
R.36 (1.35–2.32) Gong: {-jij}	III ₃	Rhyme 庚三 (-iæŋ) 榮 <i>ɣiwaæŋ</i> 永 <i>ɣiwaæŋX</i> Rhyme 麻三 (-iæ) 奢 <i>ɛiæ</i> Rhyme 清 (-ieŋ) 程 <i>qieŋ</i> 鄭 <i>qieŋH</i> 政 <i>tɛeŋH</i> 整 <i>tɛeŋX</i>
	IV ₃	Rhyme 清 (-jien) 逞 <i>jeŋ</i> 穎 <i>jweŋX</i> 穎 <i>jweŋX</i>
R.37 (1.36–2.33) Gong: {-jij} (=R.36)	I	Rhyme 東 (-uŋ) 蒙 <i>muŋ</i>
	III ₃	Rhyme 庚三 (-iæŋ) 京 <i>kiæŋ</i> 卿 <i>khiaæŋ</i> 荆 <i>kiæŋ</i> 炳 <i>piæŋX</i> 平 <i>biaæŋ</i> 明 <i>miæŋ</i> 鳴 <i>miæŋ</i> 敬 <i>kiæŋH</i> 慶 <i>khiaæŋH</i> 景 <i>kiæŋX</i> 命 <i>miæŋH</i> Rhyme 侵 (-im) 歆 <i>him</i> Rhyme 微 (-iij) 晞 <i>xiiɣ</i> 圻 <i>giij</i> Rhyme 元 (-ian) 獻 <i>xianH</i> Rhyme 清 (-ieŋ) 令 <i>lieŋH</i>
	IV ₃	Rhyme 清 (-jien) 并 <i>pjien</i> Rhyme 脂 (-jij) 夷 <i>jij</i> Rhyme 仙 (-jien) 綿 <i>mjien</i> Rhyme 麻三 (-iæ) 謝 <i>zjæH</i> 邪 <i>zjæ</i> Rhyme 清 (-ieŋ) 省 <i>sienX</i>
	IV ₄	Rhyme 先 (-en) 堅 <i>ken</i> 年 <i>nen</i> Rhyme 屑 (-et) 韻 <i>yet</i> Rhyme 青 (-eŋ) 經 <i>keŋ</i> 寧 <i>neŋ</i> 亭 <i>deŋ</i> 定 <i>deŋH</i> Rhyme 齊 (-ej) 犀 <i>sej</i>

Table 3. Near-complementary distribution of Tangut R.36 and R.37 vis-à-vis initials

	I {p-}	II {w-}	III {t-}	IV (=VII)	V {k-}	VI {ts-}	VII {tʃs-}	VIII {-}	IX {l-}
R.36	–	+	–	–	–	–	+	–	–
R.37	+	–	+	–	+	+	霞 ₁₀₅₈	+	+

century northern dialect transcribed in the dictionary *Mengguziyun* 蒙古字韻, which is the close sister to the ancestor of Beijing Mandarin, interpretation cited from Coblin 2007), the distinction is not reflected in Tangut: 京 (III₃) *kiæŋ*, 'Phags-pa [kin] and 經 (IV₄) *keŋ*, 'Phags-pa [kjin] are both transcribed by the same character 𪚩₂₂₁₉ {*kjij*}ⁿ. In fact, a fairly solid case can be made that the distinction between the rhymes R.36 and R.37 results from a slavish imitation of the Chinese phonological tradition: in Chinese rhyme tables such as *Yunjing* (韻鏡),

which provides the model for the native analysis of Tangut syllables, labiodentals (*qingchun* 輕脣, =Tangut II), retroflex stops (*sheshang* 舌上, =Tangut IV) and hushing sounds (*zhengchi* 正齒, =Tangut VII) in Division III rhymes are placed on Rank III, not Rank IV.

This observation has both linguistic and metalinguistic implications: Tangut has phonological features similar to whatever value Chinese grades had in the dialect in contact with Tangut; Tangut philologists were aware of Chinese philologists' classification of Chinese syllables into ranks, a practice which they adopted to Tangut.

A question still lingers: as the native phonological analysis in this case closely follows, even a bit too closely, the Chinese model, does it still reflect a genuine category in Tangut phonology? The research of Hwang-cherng Gong (1988; 1989a; 1993; 2001) on Tangut morphophonology confirms his analysis of grades as a real, psychologically active phonological category. For example, in partial reduplication, where the vowel of the reduplicant is replaced by *ə*, the reduplicant shows the same grade as the base (examples taken from Hwang-cherng Gong 1997).

- Grade I base has a Grade I reduplicant: to 𐞖₄₇₆₇ {*ywəj*¹} 'to fight', the reduplicated form is 𐞖₃₅₅₉𐞖₄₇₆₇ {*ywə'ywəj*¹} 'fight'. The base belongs to R.34, the Grade-I rhyme in the group R.34–R.37; the reduplicant belongs to R.28, the Grade-I rhyme in the group R.28–R.31.
- Grade II base has a Grade II reduplicant: to 𐞖₀₇₆₂ {*džiej*²} 'to revolve, wheel', the reduplicated form is 𐞖₅₉₃₇𐞖₀₇₆₂ {*džie²džiej*²} 'rotation, *saṃsāra*'. The base belongs to R.35, the Grade-II rhyme in its group; the reduplicant belongs to R.29, the Grade-II rhyme in its group.
- Grade III base has a Grade III reduplicant: to 𐞖₁₈₉₀ {*bji*²} 'high', the reduplicated form is 𐞖₄₅₁₁𐞖₁₈₉₀ {*bji'bji*²} 'high'. The precise formation here is likely cognate to the Rgyalrong reduplicated intensive, cf. Zbu /-ⁿbrúⁿbra/ 'very high', derived from /-ⁿbrá/. The base belongs to R.36, the Grade-III rhyme in its group; the reduplicant belongs to R.31, the Grade-III rhyme in its group.

2.2 Traditional values given to Tangut grades

Hwang-cherng Gong reconstructed Tangut grades in the following fashion:

- Grade I has no medials (-Ø-);
- Grade II has a -*i*- as medial;
- Grade III has -*j*- as medial. For rhyme groups with an allophony between the rhyme *i* ~ *e* or *i* ~ *ə*, the lower variants *e*, *ə* appear in Grades I/II, the higher variant *i*, *i* appear in Grade III.

His reconstruction is directly continued from earlier scholars working on Tangut. Hashimoto (1963) reconstructed *-y-* for Grade III rhymes, as they are transcribed by Chinese syllables which are “*yōon-kei* (拗音系)”, i.e. that have a palatal medial. Sofronov (1968: 110–114) found that certain Grade III syllables are transcribed in Tibetan with *-y-*: we cite from Chung-pui Tai (2008) the syllable 𐰇𐰏₁₃₇₅ *gju*¹, rendered as <bgju> and <'gyu>. He considers Grade III as palatalized and reconstruct it as *-i-*. He reconstructed Grade I syllables as non-palatalized and Grade II syllables as showing a medial yod “somewhat weaker¹³ than the yod of Grade III” (несколько слабее юта третьего дэна, 112).

This traditional reconstruction can be referred to as the yod theory, as the different grades are reconstructed as the presence and nature of a medial i-like element, commonly referred to as yod. As this section will show, the yod theory is not supported by most transcriptional evidence, and needs to be updated.

2.3 Tibetan, Sanskrit and Chinese transcription evidence does not support *-i-* for Grade II

Although Sofronov (1968) reconstructed Tangut Grade II as a weaker yod, transcribed *-i-* by Hwang-cherng Gong, as Sofronov himself noted, Tangut syllables of Grade II are not rendered with a Tibetan <*-y-*>, a fact he explained with the relative weakness of Tangut Grade-II yod. We examine a few examples from Tai (2008): 𐰇𐰏₂₇₃₆ {*biaa*²}, a character in proper names and transcriptions, transcribed <'bar>; 𐰇𐰏₂₇₂₅ {*wiŋ*¹} ‘circle’ is transcribed <wo>. Similarly, in the rare examples where Grade II syllables are used to transcribe Sanskrit, the Sanskrit original does not have any palatal element. For example, 𐰇𐰏₄₆₂₃, a Grade II syllable transcribed by Hwang-cherng Gong as {*iaa*²}, is a character created to transcribe a long *ā* in Sanskrit (graphically 𐰇𐰏₄₅₄₁ {*ja?*} “Skt. short *a*” + 𐰇𐰏₀₄₄₃ {*džjo*¹} ‘long’).

In addition to Tibetan and Sanskrit, reconstructing *-i-* for Grade II receives no support from the Chinese transcription. Tangut Grade II syllables mostly transcribe and are transcribed by Chinese Grade-II syllables. In Imperial-era Tibetan, transcription of Chinese (Charngeir Luo 1933), which reflects a dialect that represents the direct ancestor of mediaeval Hexi Chinese,¹⁴ 嘉 II *kæ* is ren-

13. That is to say, a yod less palatal than the Grade-III yod: this intuition underlies Hwang-cherng Gong's notation of *-i-*.

14. The continuity between the dialect behind Imperial-period Tibetan transcription of Chinese and mediaeval Hexi Chinese is supposed in most work on mediaeval Hexi Chinese, and explicitly stated in Hwang-cherng Gong (1989b). A detailed analysis between the different Northeastern transcriptions of Chinese will be undertaken in another essay. Here, I content myself with citing a highly deviant shared innovation between Hexi Chinese and Imperial-

dered <ka'>, unlike the traditional reconstruction of 𪚩₅₉₁₀, which transcribes the homophonous 家 II *kæ*, as *kia'*.

Division II syllables do have medial yods in Mandarin dialects and related Sino-Xenic systems (most consistently Sino-Vietnamese), but only after velar and laryngeal initials. For the character 𪚩₅₉₁₀, which transcribes 家 II *kæ*, the traditional reconstruction as {*kia'*¹} can be justified by Mandarin-like sources: one might cite Beijing *jiā*, Sino-Vietnamese *gia* [ʒa] < *ʃa < *ca, Sino-Khitani 𪚩₇₃₆ *k-ia* (Takeuchi 2011). However, for the character 𪚩₂₇₃₆, which transcribes 馬 II *mæX*, the traditional reconstruction {*biaa'*²} has no outside parallels in its favour, cf. Beijing Mandarin *mǎ*, Sino-Vietnamese *mā*, Sino-Khitani 𪚩₂₇₃₆ *m-a* (Zhongwei Shen 2007). Indeed, I know of no modern Chinese dialect or Sino-Xenic pronunciation system that consistently shows medial yods in Grade II syllables.¹⁵

2.4 Tibetan and Sanskrit transcription evidence does not support -j- for Grade III

Now let us turn our attention to Grade III, which transcribes Chinese Grade III/IV syllables. In many modern dialects, Grade III/IV syllables show a medial -j-, so the traditional reconstruction of -j- is not *prima facie* unjustified on the Chinese evidence. However, it is in conflict with the other major sources of transcription evidence.

Tibetan transcription of Tangut, as Sofronov pointed out, does render Grade III syllables at times with a <-y->. A closer examination reveals that this <-y-> occurs under extremely limited circumstances, which will be further examined in §5.3.2. In general, Tangut Grade III syllables are not transcribed with a Tibetan <-y->. For example, in the sources of Tibetan transcription of Tangut surveyed in Chung-pui Tai (2008), there are 22 distinct Tangut characters, transcribed 141

period Tibetan transcription of Chinese (cf. Hwang-cherng Gong 1981), the initial consonant *niang* 娘, which is pronounced a retroflex *ŋ in Middle Chinese, became an affricate [ʈdʒ] in both: 女 *ŋiaX* is transcribed <'ji> in imperial-era Tibetan sources, and 𪚩₄₇₀₆ {*džjuu'*²} in the *Pearl in the hand*.

15. Note, however, that Wuyun Pan (2000) cited several Chinese dialects with a Grade-II medial yod. The only one I am able to verify is Ling (伶話), a Chinese dialect spoken by ethnic Miao in Guangxi. Pan cited the following words in this language: 爬 (II) *bæ* 'crawl' [bia], 埋 (II) *měj* 'bury' [mia], 𪚩 (II) *nεX* 'milk' [nia], 八 (II) *pεt* 'eight' [pia]. However, among a larger lexicon (Tan Pang Ho 2009), 爬 (II) *bæ* is in fact the only word of rhyme 麻 (-æ) with -ia; 埋 (II) *měj* and 𪚩 (II) *nεX* pattern with other Grade I syllables with *ai*-ish rimes in other varieties of Chinese: 來 (I) *laj* [lia], 耐 (I) *najH* [nia]. The Ling situation can be explained by a recent sound change [-ia] < *-ai, *-at, similar to the genesis of the rhyme -oa in Southern Min (Norman 1981: 45), and could not be cited as an example of Grade-II medial yod.

times, with an initial labial *p-*, *ph-*, *b-*, *m-*, only one word has a possible Tibetan rendering with <-y->: 𑖦𑖳₅₄₁₅ {*bju*¹} ‘wise’, transcribed twice by Hand A, once as <‘bu>, once as <‘byu>. The remaining 139 renderings have no medial <-y->.

For Sanskrit, working Tangutologists have always found it unusual that the Tangut transcription of Sanskrit presents many syllables with a medial *-j-* (e.g. Ying-chin Lin 2004: 471, Footnote 30). To illustrate this, we examine no less well-known an example than the mantra *om mani padme hum*. The standard Tangut rendering of this mantra, attested in sources ranging from the *Pearl in the hand* to the Mongol-period Sulaiman’s Stele, is as follows: 𑖦𑖳₀₇₇₄𑖦𑖳₃₃₆₉ 𑖦𑖳₄₈₈₄𑖦𑖳₃₄₂₅𑖦𑖳₀₂₀₁𑖦𑖳₂₂₂₄. The Tangut readings of the characters that transcribe *om* and *hum* are considered unknown by Ying-chin Lin (2006:288). The four syllables in the middle, 𑖦𑖳₃₃₆₉ 𑖦𑖳₄₈₈₄𑖦𑖳₃₄₂₅𑖦𑖳₀₂₀₁, are transcribed {*mja*¹ *nji*² *pja*¹ *mji*¹} in Hwang-cherng Gong’s reconstruction. It is difficult to imagine why Tanguts would transcribe Sanskrit *ma* as Tangut {*mja*¹}, or Sanskrit *pad* as Tangut {*pja*¹}.

A piece of typological evidence, which will be examined again in § 5.1, shows that Grade III is phonologically less marked than Grade I/II: Grade III syllables have higher type and token frequency, and almost all verb affixes and pronouns are Grade III syllables. It is surprising for unmarked syllable structures to contain a medial *-j-*, while the marked ones do not.

The Chinese evidence will be reexamined in § 5.3.3. There it would be argued that while Hexi Late Middle Chinese did have a medial *-j-* in Grade III/IV syllables, certain asymmetries in the Chinese transcription data point to an absence of medial *-j-* in the analogous Tangut Grade III.

3. Uvular initials in Tangut

3.1 Tangut grade corresponds to Japhug Rgyalrong velar/uvular distinction

The available evidence poses a conundrum: a *prima facie* reading of the Chinese transcription strongly suggests the presence of yods, while the rest of the evidence just as strongly militates against them. In addition, if the yods are to be eliminated, in order to preserve the distinction between grades, what kind of phonological contrast should be reconstructed in their place? The answer comes from comparison with other Qiangic languages.

Jacques (2014) has Japhug Rgyalrong as his principal object of comparison for Tangut. Japhug (or Chabao) belongs to the Rgyalrong proper group, which includes also Situ (Eastern Rgyalrong), Tshobdun (Caodeng) and Zbu (Ribü, Showu). Apart from Rgyalrong proper, Rgyalrongic languages also comprise the group of West Rgyalrongic, which includes two main branches, Khroskyabs

(Lavrung) and Stau-Horpa. Apart from the Japhug cognates provided in Jacques (2014), I cite also data from other Rgyalrongic languages with a contrast between velar and uvular consonants, mostly Zbu and West Rgyalrongic.¹⁶

Japhug Rgyalrong and the other Rgyalrongic languages cited have the distinction between velar consonants (K-) and uvular consonants (Q-). When I examined the cognates proposed in Jacques (2014), I noticed the following pattern: Tangut phonologically velar initials (*k-*, *kh-*, *g-*, *ɣ-*) correspond to both velars and uvulars consonants in Japhug Rgyalrong, with the following distribution:

- If a Tangut word is a Grade-I or Grade-II syllable, its cognate has a uvular in Japhug.
- If a Tangut word is a Grade-III syllable, its cognate has a velar in Japhug.

This situation is illustrated in Table 4 with three examples from the rhyme group *a*, which correspond to closed /-aC/ rhymes in Japhug Rgyalrong. In the following sections, we study the Tangut-Japhug correspondences in detail by Tangut grade.

Table 4. Rgyalrongic cognates of Tangut words of different grades

Tangut Grade	Tangut example	Japhug Rgyalrong	Other Rgyalrongic
Grade I (-Ø-)	𐞗 ₄₉₃₅ { <i>ɣa</i> ³ } ‘needle’	/q-/: /taqaβ/ ‘needle’	Zbu /teʁêv/, Stau (Dpa’dbang) /ba/
Grade II (-i-)	𐞗 ₄₆₈₀ { <i>khia</i> ³ } ‘ploughshare’	/qr-/: /qraβ/ ‘ploughshare’	Zbu /qhréʔ/
Grade III (-j-)	𐞗 ₄₀₀₃ { <i>khja</i> ³ } ‘draw (water)’	/k-/: /-kaβ/ ‘carry (water) on back’	Stau /-khev/

As is shown in Table 5, among 14 cognate sets where the Tangut form has a phonologically velar initial and belongs to the Grade I, 10 cognate sets show the expected uvular initial in Japhug Rgyalrong.

16. Japhug (Lin & Luo 2003; Jacques 2008 *et passim*) data is cited from Jacques (2014), and checked against the latest version of Jacques’ dictionary (2016). Zbu Rgyalrong (Sun 2004b; Xun Gong 2014) data are cited from my own fieldnotes from the village of *rjaltsúv*?. Khroskyabs data (labelled “Khr”, Bufan Huang 2007; Yunfan Lai 2015 *et passim*) are kindly provided by Yunfan Lai. Stau-Horpa data (labelled “Stau”) are cited from two different sources. When without annotation, they are kindly provided by Guillaume Jacques, Yunfan Lai, Anton Antonov and Lobsang Nima (cf. the authors 2017). Stau data are also cited from the *rGyalrongic languages database*, edited by Yasuhiko Nagano and Mariëlle Prins (2012). In this case, they are annotated with the locality in the Database. For example, “Stau (Nye-dga)” designates the language spoken in Nye-dga, classified as a Stau-Horpa dialect.

Table 5. Regular Rgyalrongic cognates of Tangut words of Grade I

Tangut rhyme	Tangut example	Japhug Rgyalrong	Other Rgyalrongic
R.04 (1.4–2.4)	𐽀 ₅₈₉₀ {ku ¹ } ‘loose’	/ngu/ ‘loose’	Zbu /- ⁿ gú/
	𐽀 ₁₀₃₂₈ {ku ² } ‘blind’	/ɛquwa/ ‘blind’	Zbu /ɛqovɛ/, Stau (Nye-dga) /phaqho/
R.61 (1.58–2.51)	𐽀 ₂₅₀₃ {ku ¹ } ‘after’	/u-qhu/ ‘after’	Zbu /və-ɰú/, Stau (Phyag-ru) /ɕoɽu/
R.17 (1.17–2.14)	𐽀 ₄₉₃₅ {ya ¹ } ‘needle’	/taqaβ/ ‘needle’	Zbu /tɛkɛv/, Stau (Dpa’-dbang) /ɬa/
R.66 (1.63–2.56)	𐽀 ₁₀₈₄ {ya ² } ‘ten’	/sqi/ ‘ten’ ¹⁷	Zbu /sɛkɛʔ/, Stau /zɬa/
	𐽀 ₁₇₅₂ {kwa ² } ‘hoe’	/qas/ ‘hoe’	Zbu /qweɬ/
R.85 (1.80–2.73)	𐽀 ₄₄₈₀ {kar ² } ‘split’	/qɣt/ ‘split’	–
R.28 (1.27–2.25)	𐽀 ₀₀₇₄ {khwə ¹ } ‘half’	/u-qiu/ ‘half’	Zbu /və-ɰə/, Stau (Rtsang-khogs) /qhə/
R.95 (1.89–2.80)	𐽀 ₀₄₅₈ {kor ¹ } ‘throat’	/tu-rqo/ ‘throat’	Zbu /tə-rqhweʔ/, Stau /rqwa/
R.97 (1.91–2.82)	𐽀 ₀₀₃₉ {kowr ² } ‘tooth’	/tx-mgom/ ‘clamp’	–

As is shown in Table 6, among 9 cognate sets where the Tangut form has a velar-type initial and belongs to the Grade II, all 9 show the expected uvular initial in Japhug Rgyalrong.

Table 6. Regular Rgyalrongic cognates of Tangut words of Grade II

Tangut rhyme	Tangut example	Japhug Rgyalrong	Other Rgyalrongic
R.09 (1.9–2.8)	𐽀 ₂₁₄₄ {gie ¹ } ‘difficult’	/nqa/ ‘difficult’	Zbu /- ⁿ gé/, Stau (Nyagrong Minyag) /-ngə.rə/
	𐽀 ₃₅₉₆ {yiwe ¹ } ‘power’ ¹⁸	/-βɬa/ ‘prevail’	Zbu /-vɛɛ/
	𐽀 ₄₀₉₂ {khie ¹ } ‘hate’ cf. Stem B 𐽀 ₁₅₂₅ {khio ¹ }	/-qha/ ‘hate’	Zbu /-qɛ/
	𐽀 ₁₁₉₅ {khie ² } ‘yak’	/qra/ ‘female yak’	Zbu /qhríʔ/, Stau /qrə/
R.69 (1.66–2.59)	𐽀 ₀₄₃₉ {yiɛ ¹ } ‘cook’	/-sqɑ/ ‘cook’	Zbu /-sqɛ/, Stau /zɰi/
R.18 (1.18–2.15)	𐽀 ₄₆₈₀ {khia ² } ‘ploughshare’	/qraβ/ ‘ploughshare’	Zbu /qhrɛɬ/
R.28 (1.28–2.26)	𐽀 ₃₅₁₇ {khiwə ¹ } ‘horn’	/taɣru/ ‘horn’	Zbu /tɛɣrə/, Stau /qrəmbə/
R.35 (1.34–2.31)	𐽀 ₅₁₄₃ {kiej ¹ } ‘insult’	/nɣmqe/ ‘scold’ cf. /tu-mqaj/ ‘scolding’	Zbu /-mqɛ/
R.63 (1.60–2.53)	𐽀 ₃₃₆₁ {kiej ¹ } ‘sister of a woman’	/tx-sqhaj/ ‘sister of a woman’	Zbu /tɛ-sqhɛʔ/, Stau /sqi/

17. For the rhyme correspondence, cf. Japhug forms for numbers 11–19, in which ‘ten’ is represented by a prefix /sqap-/ like /sqaptuɣ/ ‘eleven’.

18. For the cognate set 𐽀₃₅₉₆ {yiwe¹} (esp. political) ‘power’, compared to /-βɬa/ ‘prevail’, compare the agent nominalization /kuβɬa/, /kəvɛʔ/ in Zbu, which designates the nobility

As is shown in Table 7, among 29 cognate sets where the Tangut form has a velar-type initial and belongs to the Grade I, 25 cognate sets show the expected velar initial in Japhug Rgyalrong.

Table 7. Regular Rgyalrongic cognates of Tangut words of Grade III

Tangut rhyme	Tangut example	Japhug Rgyalrong	Other Rgyalrongic
R.03 (1.3–2.3)	𐽳 ₃₀₅₃ {gju ¹ } ‘cross (rivers)’	/-zɲgu/ ‘cross (rivers)’	Zbu /-z ⁿ gû/
	𐽳 ₁₉₀₇ {gju ² } ‘sinew’	/tuw-ɲgru/ ‘sinew’	Zbu /tə- ⁿ grâ/, Stau /kəɾə/
	𐽳 ₃₆₀₀ {yju ¹ } ‘call’	/-akhu/ ‘call’	–
	𐽳 ₃₆₇₃ {yju ² } ‘smoke’	/tr-khu/ ‘smoke’	Zbu /tekát/, Stau /mkhə/
R.62 (1.59–2.52)	𐽳 ₂₂₇₈ {kju ¹ } ‘ <i>Allium</i> spp. (onions...)’	/ɕku/ ‘ <i>Allium</i> spp.’	Zbu /skû/
R.81 (1.76–2.70)	𐽳 ₅₃₉₆ {kjur ¹ } ‘put inside’ cf. Stem B 𐽳 ₃₆₇₅ {kjɔ ¹ }	/-rku/ ‘put inside’	Zbu /-rkû/
R.11 (1.11–2.10)	𐽳 ₄₉₀₆ {gjiw ¹ } ‘put on (clothing)’ cf. Stem B 𐽳 ₃₆₈₆ {gjwo ² }	/-ɲga/ ‘put on’	Zbu /- ⁿ gwê/, Stau /-gə/
	𐽳 ₄₈₀₇ {khji ¹ } ‘throw, lose’	/-kra/ ‘cause to fall down’	–
	𐽳 ₁₆₃₈ {gji ¹ } ‘clear’	/-amgri/ ‘clear (water)’	Zbu /-əmgré/
R.70 (1.67–2.60)	𐽳 ₃₈₆₉ {kjwi ¹ } ‘full up’	/-fka/ ‘full up’	Stau /-fkə/
R.19 (1.19–2.16)	𐽳 ₃₀₀₈ {yja ² } ‘cover’	/-fkaβ/ ‘cover’	Zbu /-fkêv/
R.20 (1.20–2.17)	𐽳 ₄₀₀₃ {khja ² } ‘draw (water)’	/-kaβ/ ‘carry (water)’	Stau /-khev/
R.31 (1.30–2.28)	𐽳 ₁₂₀₀ {khjwi ¹ } ‘dog’	/khuwa/ ‘dog’	Zbu /kwəzɛ/, Stau /kəta/
R.33 (1.32–2.29)	𐽳 ₃₁₁₃ {gji ¹ } ‘nine’	/kwungut/ ‘nine’	Zbu /kən ⁿ gát/, Stau (Phyag-ru) /ngə/
R.92 (1.86–2.77)	𐽳 ₀₀₆₅ {gjwir ² } ‘back (of the body)’	/tuw-mguw/ ‘back’	Zbu /tə-mgêr/
	𐽳 ₃₆₈₈ {gjwir ¹ } ‘lie down’	/-rɲguw/ ‘lie down’	Zbu /-r ⁿ gá/, Stau /rgə/
R.100 (1.92–2.85)	𐽳 ₃₅₈₂ {kjiiir ² } ‘gallbladder’	/tuw-ɕkrut/ ‘gallbladder’	Zbu /tə-ɕkrát/
	𐽳 ₅₈₁₇ {kjwiir ¹ } ‘steal’ cf. alternate form 𐽳 ₅₉₀₄ kjur ²	/-murkuw/ ‘steal’	Zbu /-mərka/, Stau /-rkə/
R.37 (1.36–2.33)	𐽳 ₂₄₇₈ {khji ¹ } ‘extend (esp. in order to dry in the sun)’	/-ɕkho/ ‘extend (esp. in order to dry in the sun)’	Zbu /-skê/, Stau /khji/
	𐽳 ₅₇₇₈ {khji ¹ } ‘cut, chop’	/-rɕkrw/ ‘cut, chop’ ¹⁹	–

(kings and lords) in Rgyalrong-speaking societies (Jacques 2014: 107). In Zbu Rgyalrong, the verb /-vɛ́/ has the sense of ‘be more powerful than’: *əkúŋ və-têɛ kə-vɛ́ kə-və mət* ‘Nobody can be more powerful than this one (the Government)’.

Table 7. (continued)

Tangut rhyme	Tangut example	Japhug Rgyalrong	Other Rgyalrongic
R.64 (1.61–2.54)	𐽳 ₀₁₀₉ {gjiʝ ¹ } ‘star’	/zɲgri/ ‘star’	Zbu /z ⁿ gríʔ/, Stau (Dpa-dbang) /zgre/
R.43 (1.42–2.37)	𐽳 ₅₄₉₇ {yjiʝ ¹ } ‘pillow’	/tɣ-mkum/ ‘pillow’	Zbu /tɛ-mkôm/
R.94 (1.88–2.79)	𐽳 ₁₂₉₈ {kjiwr ² } ‘elbow’	/tuɹ-zgru/ ‘elbow’	Zbu /tə-krənvzû/
	𐽳 ₁₃₇₇ {kjiwr ² } ‘oblique’	/-krɣ/ ‘bend’	Zbu /-kôɣ/
R.58 (1.56–2.49)	𐽳 ₁₁₀₅ {khjow ² } ‘give’ cf. Stem B 𐽳 ₅₆₄₄ {khjiʝ ¹ }	/-kho/ ‘give’ ²⁰	Zbu /-khêm/

3.2 Exceptions to the correspondence

The rate of correspondence is very high: among the 52 cognate pairs, 45 of them (87%) show the expected correspondence, and as such requires no further discussion. In this section, we examine the discrepancy of the remaining 7 cognate pairs.

We consider first the type of exceptions, shown in Table 8, where we have Grade I in Tangut, but the Japhug cognates, instead of having the expected uvu-lars, have in fact a velar initial.

Table 8. Exceptional Rgyalrongic cognates of Tangut words of Grade I

Tangut rhyme	Tangut example	Japhug Rgyalrong	Other Rgyalrongic
R.01 (1.1–2.1)	𐽳 ₁₁₃₆ {gu ² } ‘inside’	/w-ɲgu/ ‘inside’	–
R.04 (1.4–2.4)	𐽳 ₂₇₅₀ {ɣu ¹ } ‘head’	/tuɹ-ku/ ‘head’	Zbu /tə-kúʔ/, Stau /ɤə/, Khr /ɤû/
	𐽳 ₄₁₈₉ {khu ¹ } ‘bowl’	/khuɽsa/ ‘bowl’	Stau /qhəzə/, Khr /qhû/
R.90 (1.84–2.76)	𐽳 ₀₈₆₀ {kwər ¹ } ‘body’	/tuɹ-skhru/ ‘body’	–

These words present a rather uniform profile: the Tangut words have rhymes *-u* or *-wə*, while the Rgyalrongic comparanda have open-voweled, high and non-front rhymes, either */-u/* or */-ə/* (transcribed */-u/* in Japhug). For the words where we have good cognates in West Rgyalrongic (‘head’ and ‘bowl’), West Rgyalrongic (Stau and Khroskyabs) has uvulars while Japhug and Zbu have velars. This suggests that the velars in Japhug and Zbu might derive from a secondary deuvular-

19. Guillaume Jacques (p.c.) now considers this verb as derived from an ideophone /kuɤkrw ~ kruɤkrw/ (Jacques 2016, s.v. *kuɤkrw*), which, in conjunction with the light verb */-ta/* ‘put’, means ‘cut into pieces’.

20. Jacques (2014: 200–201) explains the Stem A form 𐽳₁₁₀₅ {khjow²} as cognate to the Japhug stem 3 /khɣm/, on which the basic stem /kho/ is remade. In the Rgyaltsu dialect of Zbu Rgyalrong, this verb has stem 1 /khêm/ and stem 3 /‘khâm/, which corresponds to Jacques’ Pre-Tangut *khjvm and *khim for the two stems.

ization **Qu* > *Ku*. However, the existence of words in *-Qu* and *-Quu* in Japhug, like /u-qhu/ ‘after’ (equally with a Grade I Tangut cognate 𐽀₂₅₀₃ *ku*¹ ‘after’), /u-rqu/ ‘cold things’ (words cited from Jacques 2016, cf. Zbu /və-kû/ ‘after’, /cərqu?/ ‘cold water’) makes it clear that there is some additional conditioning. Before the precise conditioning of the deuvularization can be found, it is prudent to count only ‘head’ and ‘bowl’ as non-exceptions, on the authority of West Rgyalrongic languages.

The second type of exceptions, shown in Table 9, concern cognate sets where the Tangut word is Grade III, but the Japhug cognates, instead of having the expected velars, have in fact a uvular initial.

Table 9. Exceptional Rgyalrongic cognates of Tangut words of Grade III

Tangut rhyme	Tangut example	Japhug Rgyalrong	Other Rgyalrongic
R.06 (1.6)	𐽀 ₄₀₄₀ { <i>khjuu</i> ¹ } ‘greet, pick up’	/-qru/ ‘greet, pick up’	Zbu /-qhrə/, Stau /-nqhrə/
R.38 (1.37–2.33)	𐽀 ₃₆₂₆ { <i>khjiij</i> ² } ‘pigeon’	/qro/ ‘pigeon’	Zbu /khrêx/, Tshobdun /qri?/, Khr /sqhré/
R.94 (1.88–2.79)	𐽀 ₂₇₆₈ { <i>kjiwr</i> ¹ } ‘ant’	/qro/ ‘ant’	Zbu /khrôx/, Khr /skhrây/, Stau /skhru/

The word ‘ant’ causes few difficulties. Not only Khroskyabs and Stau, but also Zbu Rgyalrong have a velar form which is expected from the Grade III of Tangut. The Japhug Rgyalrong form /qro/ is clearly borrowed from Tshobdun /qrô/,²¹ /ɔ/ being the regular Tshobdun reflex of the expected Japhug rhyme *-oɤ, and have probably uvularized the originally velar initial. The remaining words, ‘greet, pick up’ and ‘pigeon’ are counted as exceptions.

In conclusion, 3 apparent exceptions can be dismissed with confidence as due to secondary developments or intra-Rgyalrongic borrowings in Japhug Rgyalrong. Only 4 exceptions (8%) are left unaccounted for. The correspondence between Tangut Grade I/II and Japhug uvulars, and between Tangut Grade III and Japhug velars, can be regarded as solid.

A brief note is needed on the origin of initial consonant *ŋ*- in Tangut. They are not considered in the discussion, as there is no distinction between velar /ŋ-/ and uvular /N-/ in Japhug Rgyalrong. In Tangut, initial *ŋ*- has a strong affinity with Grade I: among 120 entries with initial *ŋ*- in Fanwen Li’s dictionary (2008): 99

21. Cf. Guillaume Jacques, “Les emprunts entre dialectes ou langues proches (1)”, *Panchronica*, 04/06/2015, <http://panchr.hypotheses.org/323> (ISSN 2494-775X). The Tshobdun form is cited from the *rGyalrongic languages database*.

are Grade I, 3 are Grade II, 18 are Grade III. Most notably, among the 12 Tangut words in *ŋ*- etymologized in Jacques (2014), all are Grade-I syllables. Most of them correspond to /ŋ-/ in Japhug Rgyalrong, with two counter-examples, 𐞧𐞮₃₃₈₈ {*ŋwu*²} ‘cry’ cf. Japhug /-ɣɿwu/ ‘cry’, Zbu /-vewô/; 𐞧𐞮₂₈₅₇ {*ŋo*²} ‘illness’, cf. Japhug /-ngo/ ‘be ill’, Zbu /-ⁿgɛ/. Jacques (2014: 75, 202) judged both comparisons “problématique[s]”, and included them only on a tentative basis.²²

4. The uvularization hypothesis

4.1 Uvulars in Tangut

In §2, it is argued that the traditional reconstruction of Tangut Grade III as a medial yod (-j-) is untenable. Comparison with Japhug Rgyalrong reveals that Grades I and II correspond to Japhug uvular consonants, while Grade III corresponds to Japhug velar consonants. This suggests that uvular consonants should be reconstructed for Tangut: Grade I are revised from {KV} to QV, Grade II from {ḲiV} to Q̣iV, and Grade III from {ḲjV} to KV. By simply projecting the Japhug consonantism on the Tangut, this revision eliminates the need of a yod as a distinguishing factor for Grade III. This hypothesis, by which the distinction between velars and uvulars are reconstructed in Tangut, is summarized in Table 10.

Table 10. First proposal-eliminating Grade III yods by postulating a velar-uvular distinction

Tangut Grade	Revision proposal	Tangut example	Revision
Grade I	{KV} → QV	𐞧𐞮 ₄₉₃₅ { <i>ya</i> ¹ } ‘needle’	{ <i>ya</i> ¹ } → <i>ɣa</i> ¹
Grade II	{ḲiV} → Q̣iV	𐞧𐞮 ₄₆₈₀ { <i>khia</i> ² } ‘ploughshare’	{ <i>khia</i> ² } → <i>qhɿa</i> ²
Grade III	{ḲjV} → KV	𐞧𐞮 ₄₀₀₃ { <i>khja</i> ² } ‘draw (water)’	{ <i>khja</i> ² } → <i>kha</i> ²

The medial reconstructed for Grade II, *ɿ*, stands probably for a pharyngealized front low vowel [a̠^ɿ] or [æ̠^ɿ]. The rationale behind the reconstruction will be discussed in another essay. For the purposes of this essay, *ɿ* can be regarded as an abstract notation distinguishing Grade I and Grade II, which have otherwise the same phonological and comparative correlates concerning uvularity.

22. A better comparison for 𐞧𐞮₂₈₅₇ {*ŋo*²} ‘illness’ is Japhug /ɿɣ-ŋɿm/ ‘pain’, Zbu /tə-ŋém/ ‘illness’.

4.2 GUTTURAL SECONDARY VOCALIC ARTICULATIONS in Qiangic languages

Reconstructing initial uvular consonants points towards a satisfactory solution of the yod problem. However, the yod problem is only solved for the case where Tangut syllable has a phonologically velar initial (*k-*, *kh-*, *g-*, *ɣ-*, *ŋ-*). It is necessary to find a way to generalize it to syllables with other initials. If $\{ka\}:\{kja\}$ in the traditional reconstruction can be revised into *qa:ka*, what should $\{pa\}:\{pja\}$ be revised into? The problem can be reframed as follows: we are looking for a distinction that, for the same phonological velar initial consonant, triggers an allophony as uvulars and velars. Modern Qiangic languages, which are described with increasing phonetic precision in the recent decades, provide typological and areal models for such a generalization.

We examine first the contrast of uvularization in Northern Qiang (Sun & Evans 2013), the first to be described in a careful phonetic study (Evans et al. 2016). In the Mawo (麻窩) dialect of Northern Qiang, there are four plain vowels /a ə i u/ and four uvularized vowels /a^ʷ ə^ʷ i^ʷ u^ʷ/. Importantly, plain and uvularized vowels exhibits a complementary distribution vis-à-vis initial consonants. As is seen in Table 11, non velar-type consonants like /z/ or /b/ are compatible with both plain and uvularized vowels, velar consonants like [k] are compatible with plain vowels only, and uvular consonants like [q] are compatible with uvularized consonants only.

Table 11. Complementary distribution of uvular/velar consonants to plain/uvularized vowels

	/z/	/b/	[k]	[q]
/-i/	/zi/ 'occupied'	/bi/ 'urine'	[ki] 'house'	–
/-i ^ʷ /	/zi ^ʷ / 'ladle'	/bi ^ʷ / 'plate'	–	[qi ^ʷ] 'win'

Uvularization in the Mawo dialect of Northern Qiang is a case of GUTTURAL SECONDARY VOCALIC ARTICULATIONS (GSVA) in Qiangic languages, commonly labelled as velarization, tenseness or uvularization. Qiangic languages can be classified into three types according to GSVA: uvularity-coupled secondary articulation, uvularity-decoupled secondary articulation, and absence of GSVA.

The first type, uvularity-coupled secondary articulation, refers to GSVA that are phonologically bound with a consonantal uvular-velar distinction, like in Mawo dialect of Northern Qiang: uvulars are conditioned upon the presence of the secondary articulation, velars upon the absence. This characterizes other dialects of Northern Qiang, for example Yunlinsi (雲林寺, Evans et al. 2016), where the link is synchronically no longer phonological, so there are rare excep-

tions of velars followed by /a^ʷ/ in borrowings from Tibetan /kha^ʷ/ ‘square (of cloth)’ < Tibetan *kha* ‘square’, or caused by regressive assimilation /ka^ʷχu^ʷ/ ‘kok-lass pheasant’. (Eastern) Minyag is described by Bufan Huang (1985) with a lax/tense distinction, and by Yang Gao (2015) with a ATR/RTR distinction,²³ with the tense/RTR element spelt with an underscore. Similarly to Northern Qiang, velar consonants are compatible with lax/ATR vowels only, while uvular consonants are compatible with tense/RTR vowels only: /²ʰak̟/ ‘pillow’, /¹q̟q̟/ ‘raw’, but no syllables with /q̟/ or /k̟/.

The second type, uvularity-decoupled secondary articulation, can be illustrated with Zbu Rgyalrong, which has a distinction analyzed as velarization by Jackson T.-S. Sun (2004b). In the *rjaltśúʔ* dialect of Zbu Rgyalrong, for example, there is a distinction between plain /e/ and velarized /a/, which triggers vowel harmony: /e-wēmê/ ‘my cat’, /a-ⁿbrâ/ ‘my horse’. However, both velar and uvular consonants, in the word root, occur with /e/ only: /e-qêʔ/ ‘my wheat’, /e-rkê/ ‘my mule’. While there is no instrumental analysis on Zbu Rgyalrong yet, it is to be noted that the distinction is partially reflected as a medial -ɣ- in Japhug (Jacques 2008: 380–381): compare Zbu /-phâ/ ‘escape’ with Japhug /-phyo/. This supports Sun’s characterization of the Zbu contrast as velarization, and also the reconstruction of velarization back to the most recent common ancestor between Japhug and Zbu.

The third type, absence of GSVA, is more widespread than the presence of either type. Most contemporary Qiangic languages do not have guttural secondary articulations, but do have uvulars (Hongkai Sun 2001). In contrast, Situ Rgyalrong (Xiangrong Lin 1993) is characterized by neither.

4.3 The uvularization hypothesis

From the standpoint of this typology, I reconstruct Tangut as a Qiangic language with the first type, namely uvularity-coupled secondary articulation. Grade-I and Grade-II syllables are characterized by a GSVA, that I reconstruct as uvularization, following Northern Qiang (Evans et al. 2016), noted as -^ʷ. Some arguments for the reconstruction of the Tangut distinction as uvularization is given in § 5.1 and § 5.2.

23. No instrumental study has been yet carried out on Eastern Minyag yet. Yang Gao kindly let me listen to some of her recordings. To my ear, Minyag tense/RTR syllables are accompanied with a noise characteristic of the aryepiglottic constriction of intervocalic *ʕayn* in Levantine and Egyptian Arabic, so pharyngealization is certainly part of the story, although other forms of constriction are not to be excluded.

Grade III syllables have plain vowels. This uvularization hypothesis leads to the following revisions in the transcriptions, which are also given in Table 14 at the conclusion:

- Grade I, traditionally medialless, is reconstructed with a uvularized vowel $-V^{\text{u}}$. For example, for the Grade-I rhyme R.17 (1.17–2.14), 𐞗₀₆₃₀ ‘to weave’ $\{la^{\text{u}}\}$ is revised to la^{u} . With an initial velar consonant, the uvularized rhyme requires the uvular allophone: 𐞗₄₉₃₅ $\{ya^{\text{u}}\}$ ‘needle’ is revised to ka^{u} .
- Grade II, traditionally with a medial $-i-$, is reconstructed with a pharyngeal medial with a uvularized vowel $-\text{V}^{\text{u}}$. For example, for the Grade-II rhyme R.18 (1.18–2.15), 𐞗₂₄₇₅ ‘to break’ $\{phia^{\text{u}}\}$ is revised to $ph\text{ʕ}a^{\text{u}}$. With an initial velar consonant, the uvularized rhyme requires the uvular allophone: 𐞗₄₆₈₀ ‘ploughshare’, $\{khia^{\text{u}}\}$ is revised to $qh\text{ʕ}a^{\text{u}}$. The reconstruction of Grade II is a problem orthogonal to the topic of this essay, and will be discussed in a forthcoming study.
- Grade III, traditionally with a medial $-j-$, is reconstructed with a plain, non-uvularized vowel $-V$. For example, for the Grade-III rhyme R.19 (1.19–2.16) = R.20 (1.20–2.17), 𐞗₄₂₂₅ ‘to kill’ $\{sja^{\text{u}}\}$ is revised to sa^{u} . With an initial velar consonant, the plain rhyme requires the plain allophone: 𐞗₄₀₀₃ ‘draw (water)’ $\{khja^{\text{u}}\}$ is revised to kha^{u} .

Hwang-cherng Gong reconstructed vowel allophony for the rhyme groups i/e , i/∂ , ij/ej , $ij/\partial j$, iw/ew ; this is probably motivated by the need to avoid the homophony or near-homophony that the Grade II $-i-$ would otherwise imply: for example, without the vowel allophony, for the rhyme group i/e , both Grade II short vowel and Grade I long vowel would be transcribed as ii . As this allophony is not reflected in the Tibetan transcription, such groups are now reconstructed with a single main vowel: i/e , i/∂ , ij/ej , $ij/\partial j$, iw/ew are resolved into i , ∂ , ej , ∂j , iw . Note that i/e and iw/ew are resolved to i and iw , while ij/ej is resolved to ej , on account of transcription evidence. Finally, there is evidence that the zero initial-in Grade III, traditionally $-j-$, should be splitted into real zero initial $-$ and initial $j-$: for example,²⁴ 𐞗₅₉₈₁ $\{ja^{\text{u}}\}$ ‘one, directional prefix, polar question’ corresponds to $/e-/$, $/\partial-/$, $/u-/$ in different Rgyalrongic languages, while 𐞗₅₇₅₅ $\{jar^{\text{u}}\}$ ‘to stand’ corresponds to Situ Rgyalrong $/-rja/$. In the title of (Arya-) *Mañjuśrīnāmasaṃgīti*, the prefix *arya-* is transcribed by 𐞗₃₆₅₄ 𐞗₅₇₅₅ $\{ja^{\text{u}}-jar^{\text{u}}\}$, the first character homophonous to 𐞗₅₉₈₁ $\{ja^{\text{u}}\}$. Further investigation is needed on this question.

24. On the reconstruction of the syllables 𐞗₅₉₈₁ $\{ja^{\text{u}}\}$ and 𐞗₃₆₅₄ $\{ja^{\text{u}}\}$, cf. Ying-chin Lin (2006: 62, Footnote 1).

5. Discussion

Now that the uvularization hypothesis is raised, we proceed by evaluating the new hypothesis with a series of typological, etymological and transcriptional considerations. To facilitate discussion, in this section, Tangut characters are first transcribed in the revised reconstruction under the uvularization hypothesis, then in Hwang-cherng Gong's reconstruction given in curly brackets: 𐰚₄₉₃₅ 'needle' ka^{u1} { ya^n }.

5.1 Qiangic GSVA vs. classical cases of phonological tongue root position

While the precise phonetic and phonological nature of subtle distinctions in a dead language cannot be known with security, there are still sufficient clues to suggest that the interpretation as uvularization is preferable to the other possibilities. On a scale of backness ranging from velarity to uvularity to pharyngeality, it is clear the Tangut case is likely one of uvularity. For example, according to the typology (4.2) of GSVA in Qiangic, it is unlikely for the Tangut contrast to be a case of velarization, as velarization, in Zbu Rgyalrong and also as phonologically expected, is decoupled from the velar/uvular distinction: both plain and velarized syllables would trigger velar, and not uvular, allophones.

Articulatory uvularity that correlates with the velar/uvular distinction can be both uvularization, a secondary articulation, and the tongue-root position contrast between ATR and RTR. Tangut Grade I/II, characterized by a uvular consonant, could be RTR rather than uvularized; while Grade III, characterized by a velar consonant, could be ATR rather than plain.

In § 5.1 and § 5.2, we examine some arguments for the reconstruction as uvularization. These are not conclusive, so ATR/RTR remains a quite probable reconstruction for the Tangut distinction. I wish nevertheless to show that the current data at hand tilts in favour of a secondary articulation.

First, we examine the typological difference between Qiangic GUTTURAL SECONDARY VOWEL ARTICULATIONS (GSVA) and the paradigmatic examples of a phonological ATR/RTR distinction: nine/ten-voweled African languages²⁵ and Eastern "Altaic" languages.²⁶

In these language areas, there are reasons to consider ATR vowels less marked than RTR vowels. In nine/ten-voweled African languages (Casali 2002), RTR

25. Seven-voweled "Bantu-type" African languages are also commonly described with an ATR-RTR distinction. In these languages, ATR-RTR distinction only applies to either high vowels or mid vowels and are not free vowel features comparable to Tangut uvularization or ATR-RTR contrast in the aforementioned language areas.

vowels are more frequent than ATR vowels both in type and token frequency. Functional words mostly have RTR vowels. In the asymmetric vowel-harmony system of those languages, marked RTR vowels are dominant. Similarly, in Eastern “Altaic” languages like Khalkha Mongolian (Bao Quan 2015) and Middle Korean (Sun-woo Park 2016), RTR vowels are much more frequent than ATR vowels.

On the other hand, in Tangut, uvularized syllables (Grades I and II) are marked vis-à-vis plain syllables (Grade III). For token frequency, we take a random Tangut page – for example, page 3 of *A new collection of parental love and filial piety* (Kepping 1990; Jacques 2007) – there are 46 syllables in Grade I, 6 in Grade II and 129 in Grade III. The type frequency shows a similar, but slighter bias: Fanwen Li’s dictionary (2008) counts 2094 syllables in Grade I, 551 in Grade II, and 3145 in Grade III (54.31%). Pronouns, demonstratives and verbal affixes (cf. Hwang-cherng Gong 2003) are also all Grade III, except for the verb suffix 𐰚₀₇₃₄ *mo*^{h2} {*mo*^{h2}} and 𐰚₂₀₉₈ *Na*^{h2} {*ηa*^{h2}}, the first person singular pronoun and verb suffix.

GSVA in other Qiangic languages present the same typological profile, namely, that the presence of GSVA (\approx RTR) are more marked than their absence (\approx ATR). In her lexicon of Minyag, Yang Gao (2015) notes 650 words with at least one RTR (= Huang’s tense) vowels and 1385 with only ATR (= Huang’s lax) vowels. In Northern Qiang (Evans et al. 2016) and Zbu Rgyalrong, vowel harmony of guttural secondary articulations is a leftward spread: uvularized/velarized vowels are dominant in the vowel harmony, plain vowels recessive. This is also expected from *a priori* grounds, as the presence of GSVA is articulatorily linked with additional movements.

The Tangut typology, with uvularized vowels (\approx RTR) more marked than plain vowels (\approx ATR), agrees with the guttural secondary articulations of other Qiangic languages, and stands in direct contrast to the ATR/RTR typology of the African and “Altaic” examples. The typological argument supports the reconstruction of the Tangut distinction as a guttural secondary articulation, and not as phonological tongue root position. In § 5.2, we shall also see that a reconstruction as uvularization is the most plausible one given the general tendencies of the development of Tangut from pre-Tangut.

26. In which case, we only consider the synchronic systems and do not discuss the problem whether the ATR-RTR system diachronically derives from the front-back system (Wan-Jin Kim 1963; Svantesson 1985) or the other direction (Sang-suk Oh 1998; Seongyeon Ko 2011).

5.2 Uvularized vowels from compression of uvular elements

The origins of uvularized syllables with non-velar initials does not present as simple a picture as for velar initials, and will form the subject of a forthcoming study. Here, we examine two secure origins of Tangut uvularized syllables that are informative with regard to their phonetic and phonological value.

First, Japhug Rgyalrong words that end in /-ɣ/ correspond to Tangut uvularized syllables. Among 22 potential cognates in Jacques (2014): 18 examples present the expected correspondence, with 4 counter-examples. A few examples are given in Table 12 to illustrate this phenomenon.

Table 12. Tangut uvularized syllables corresponding to Japhug /-ɣ/

Tangut rhyme	Tangut example	Japhug Rgyalrong	Other Rgyalrongic
R.17 (1.17–2.14)	𐽳 ₀₆₃₀ <i>la^{ɣ1}</i> { <i>la^{ɣ1}</i> } ‘weave’	/-taɣ/ ‘weave’	Zbu /-tẽɣ/, Khr /dãɣvi/
R.66 (1.63–2.56)	𐽳 ₄₅₃₂ <i>pɑ^{ɣ1}</i> { <i>pɑ^{ɣ1}</i> } ‘be thirsty’	/-ɕpaɣ/ ‘be thirsty’	Zbu /-sphjẽɣ/, Stau /spar/
R.51 (1.49–2.42)	𐽳 ₀₁₁₈ <i>no^{ɣ2}</i> { <i>no^{ɣ2}</i> } ‘brain’	/tu-rnoɣ/ ‘brain’	Zbu /tə-rnôɣ/
R.96 (1.90–2.81)	𐽳 ₂₀₀₅ <i>tʂio^{ɣ1}</i> { <i>tʂio^{ɣ1}</i> } ‘mud’	/tɕ-rcoɣ/ ‘mud’	–
R.34 (1.33–2.30)	𐽳 ₄₆₈₄ <i>me^{ɣ1}</i> { <i>me^{ɣ1}</i> } ‘eye’	/tu-mɲaɣ/ ‘eye’	Zbu /tə-mɲẽɣ/, Stau /mu/
R.44 (1.43–2.38)	𐽳 ₅₁₂₀ <i>swi^{ɣ1}</i> { <i>swew^{ɣ1}</i> } ‘clear, bright’	/-fsoɣ/ ‘bright’	Zbu /-fɕôɣ/, Stau /fsu/

Not only words with Rgyalrongic—and presumably pre-Tangut—uvular coda give Grade I/II syllables in Tangut, words with preinitial uvular element in Rgyalrongic also correspond to Grade I/II in Tangut. For Japhug words with initial /qa-/, 9 cognate sets give 7 expected correspondences; for Japhug words with initial /χ- ~ ɣ-/, 6 cognate sets give 5 expected correspondences. A few examples are shown in Table 13.

These origins for uvularized vowels fits into a general pattern in the history of Tangut phonology, aptly termed *compression* by Marc Miyake (2012). By this term, Miyake covers a range of phenomena generally associated with monosyllabization, while I propose to narrow this term down to a process highly characteristic of Tangut: the tendency for phonological features from the syllable periphery to transfer to phonological features spread over the whole syllable pansyllabic.

The paradigmatic example of compression concerns the rhotacized syllables (-r) in Tangut. As Sofronov (1968: 106–110, 134–137) noted, a rhotacized syllable is usually spelt with both the *fanqie shangzi* (designating the initial consonant),

Table 13. Tangut uvularized syllables corresponding to Japhug initial uvular elements

Tangut rhyme	Tangut example	Japhug Rgyalrong	Other Rgyalrongic
R.80 (1.75–2.69)	𐞗 ₁₄₉₀ <i>tsu^ʰr</i> { <i>tsur</i> } ‘winter’	/qartsu/ ‘winter’	Zbu /qertsóʔ/, Khr /rtsó/
R.69 (1.66–2.59)	𐞗 ₀₄₉₉ <i>pŋi^ʰr</i> { <i>pie</i> } ‘frog’	/qaɛpa/ ‘frog’	Zbu /qespéʔ/, Stau /spəŋcher/
R.83 (1.78)	𐞗 ₂₅₄₇ <i>tšŋi^ʰr</i> { <i>tšier</i> } ‘right’	/χcha/ ‘right’	Zbu /quchíʔ/, Stau (Lcags-rkong) /rchila/
R.28 (1.27–2.25)	𐞗 ₅₈₄₅ <i>lwə^ʰ</i> { <i>lwə</i> } ‘buy’	/-χtu/ ‘buy’	Zbu /-χtə/, Khr /jdə/, Stau /rə/
R.08 (1.8–2.7)	𐞗 ₂₄₄₉ <i>bi^ʰ</i> { <i>be</i> } ‘sun’	/ɤmbyi/ ‘sun’	Stau /yɔ/

and the *fanqie xiazi* (designating the rhyme) rhotacized: 𐞗₅₃₉₆ *kur* {*kjur*} ‘put inside’ spelt with 𐞗₀₂₇₀ *kəər* {*kjiir*} and 𐞗₄₃₆₄ *rur* {*rjur*}. This suggests that the rhotacization is a property relevant to both the initial consonant and the rhyme, a pan-syllabic feature. Etymologically (Jacques 2014: 23–29), they descend from preinitial *r- and coda *-r. For example, 𐞗₅₃₉₆ *kur* {*kjur*} ‘put inside’, cf. Japhug /-rku/; 𐞗₂₇₃₉ *tšhwər* {*tšhjwir*} ‘sour’, cf. Japhug /-təur/. What happened was the process of compression of rhotacity, where both preinitial and coda *r are reflected now as a rhotacity spread over the whole syllable.

The process that created uvularized vowels from preinitial /qV-, ɤ- ~ χ-/ and final /-ɤ/ can be regarded as analogous to the process that created rhotacized syllables in Tangut. It has turned initial *ɤ- and final *-ɤ into a pan-syllabic uvularity. The comparison with the origin of rhotacity again suggests that the Tangut grade distinction should be reconstructed as uvularization: just as etymological *r* is reflected as rhotacity, namely pronouncing the whole syllable while doing a slight [ɹ], an etymological *ɤ* is likely to be reflected as pronouncing the whole syllable while doing a slight [ɤ]: uvularization.

5.3 Reconsidering the transcription evidence under the uvularization hypothesis

Finally, we examine the transcription evidence under the light of the uvularization hypothesis. Notably, for Chinese and Tibetan transcriptions that *prima facie* suggest Grade-III medial yods, we shall see that the data present certain structures, hitherto overlooked, which turn out to be better explained by uvularization than by yods.

5.3.1 A possible orthographical device in the Tibetan transcription for Tangut uvulars

We first note a possible orthographical device for uvulars in the Tibetan transcription of Tangut. The hands B and D, in Tai's (2008) classification, use the subjoined letter <-h-> under velar letters <k>, <kh>, and <g>, without an identified function. In fact, all 11 examples of <-h-> subjoined to velar letters concern Grade-I or Grade-II syllables with velar-type initials: <dg+hi> 禰₁₀₁₀ $B\dot{\gamma}i^{h2}$ { $\gamma i\epsilon^{21}$ }, <k+he> 疏₄₇₁₉ $q\dot{\gamma}e^{rj^2}$ { $k i\epsilon j^{21}$ }, <kh+ha> 𐌎₅₉₉₃ qha^{h1} { kha^{11} }.

If this <-h-> notes anything, it must be the uvularity of the initial consonant. We note, however, some reasons for caution. By coincidence, the hands B and D did not transcribe any secure Grade-III Tangut syllable with a phonologically velar initial, so no contrasts exist to show that <-h-> does transcribe something. There is nevertheless one syllable is transcribed <ka> by hand B: 𐌎₅₁₆₀. Fanwen Li (1997) reconstructed the syllable as $q\dot{a}^2$ { $k\dot{a}^2$ }, which he corrected in the new version of his dictionary (2008) to $q\dot{a}^2$ { $k\dot{a}^2$ }. However, in *Tongyin*, 𐌎 belongs neither to the homophone series qa { ka } (20B2–B5), nor to the series ka { kja } (28A4), but to a special series of *fanqie* characters (28B2–28B3) specially devised to transcribe Sanskrit at the end of the chapter. It is possible to argue on the ground of Sanskrit transcription that 𐌎 has a velar initial, which, in turn, raises the question concerning the phonetic difference between 𐌎 and the ka { kja } series.

Hongyin Nie (1986: 62–66) proposed a correlation between preinitials <'-> and <g-> in the Tibetan transcription and Grade-III and Grade-IV syllables in transcription from or to Chinese. According to the grade theory of Tangut in the version of Hwang-cherng Gong, this would mean that these Tibetan preinitials are orthographical devices for noting the Tangut Grade III. However, as he noted himself (Hongyin Nie 1986: 66–67), there are numerous exceptions to his generalization. I test two of the most numerous examples of these preinitials on the latest edition of Tangut fragments with Tibetan transcriptions (Chung-pui Tai 2008): <'b-> transcribing Tangut *b*- and <gz-> transcribing Tangut *z*-. In the first case, 4 among the transcribed syllables are Grade I/II, 7 are Grade III; in the *Tangut-Chinese dictionary*, 42% of the Tangut syllables beginning with *b*- are Grade III. In the second case, 3 among the transcribed syllables are Grade I/II, 8 are Grade III; in the *Dictionary*, 58% of the Tangut syllables beginning with *z*- are Grade III. Compared with lexicon-wide token frequency, there seems to be a weak tendency favoring Grade III syllables in syllables with <'-> or <g->, but nothing can be definitively said about this matter.

5.3.2 Grade-III syllables with <-y-> in Tibetan transcription

Sofronov (1968) reconstructed medial yods in Grade III on account of the fact that Tibetan transcription of Tangut Grade III syllables sometimes have the sub-scripted letter <-y->, which uncontroversially indicates a palatal glide or at least a palatal colour of the preceding consonant. However, under further scrutiny, it turns out that <-y-> occurs in very limited circumstances. In most of the cases, Grade-III <-y-> occurs:

1. only after velar initial consonants (Tai 2008: 154);
2. only in the rhyme groups *-u*, *-i* and *-ej*, transcribed in Tibetan as *u*, *i* and *e*.

Only when both conditions are satisfied do we find examples of Grade-III <-y->. 𐞪₁₃₇₅ *gu*¹ {*gju*¹} 'pig' is transcribed as <bgyu> and <'gyu>, because the initial consonant is velar *g*-, while the rhyme group is *-u*. Similarly, 𐞪₁₉₅₉ *kir*¹ {*kjir*¹} 'brave, brutal' is transcribed as <rkyi>, because the initial consonant is velar *k*-, while the rhyme group is *-i*. If the initial is non-velar, there is no <-y->: 𐞪₂₆₁₂ *phu*¹ {*phju*¹} is transcribed as <pho>, <pho'> and <phu+o>.²⁷ If the rhyme group is neither *-u*, *-i* nor *-ej*, there is no <-y->: 𐞪₀₀₀₅ *gow*¹ {*gjow*¹} is transcribed as <'go>.

This situation suggests the following explanation: in certain cases, Tangut velars have slightly palatal realizations. This palatalized realization only occurs with rhyme groups with front vowels *-i*, *-ej*. For *-u* it must have a quite centered realization [u]. Non-velar initials do not have this salient allophony as velar initials. The traditional reconstruction, on the other hand, cannot account of the conditions of Tibetan <-y->.

5.3.3 The curious case of R.19=20

Hashimoto (1963) reconstructed medial yods in Tangut Grade III, on the grounds that Tangut Grade III transcribes and is transcribed by Chinese Grade III/IV, which do have yods in the majority of contemporary dialects. However, a closer scrutiny of Chinese transcriptional evidence reveals a more complex situation, which points rather to the absence of medial yods in Chinese Grade III/IV.

Chinese transcriptional evidence is bipartite: there are transcriptions from Chinese to Tangut and those from Tangut to Chinese. As for grades, there is generally a symmetry between the two directions. The symmetry, however, is broken for the rhyme R.19=20 (*-a* {-*ja*}). The rhyme R.19=20 (*-a* {-*ja*}) is the Grade-III rhyme in the group R.17–R.20. The Grade-I rhyme R.17 and the Grade-II rhyme

27. This curious graphical form 𐞪 (Chung-pui Tai 2008: 58) has a *na-ro* and a *zhabs-kyu* on the same consonant letter.

R.18 in this group systematically transcribe and are transcribed by Chinese syllables of equivalent grades, as expected.

In the Tangut transcription of Chinese, R.19=20 transcribes only Chinese syllables in Grade III and IV, as is expected. We cite from Hwang-cherng Gong (1991) the examples of 𪚩₄₆₂₀ *ka*¹ {*kja*¹}, used to transcribe the Chinese characters 建 (III₃) *kianH*, 蹇 (III₃) *kienX*, 堅 (IV₄) *ken*, 吉 (IV₃) *kjit* and 汲 (III₃) *kip*, 𪚩₁₆₁₆ *pha*² {*phja*²}, used to transcribe 別 (III₃) *biet*, and 𪚩₃₆₈₃ *sa*² {*sja*²}, used to transcribe 薛 (IV₃) *siet*, 洩 (IV₃) *siet*, 仙 (IV₃) *sien* and 先 (IV₄) *sen*. On the other hand, the Chinese transcription of Tangut mostly renders R.20 with non-Grade-III rhymes, namely the rhyme *má'èr* 麻二 (-æ, Grade II) and a variety of stop-final rhymes in Grade I. In the Chinese phonetic glosses in the *Pearl in the hand*, for example, 𪚩₃₄₂₅ *pa*¹ {*pja*¹} and 𪚩₀₀₉₂ *ma*¹ {*mja*¹}, Tangut words for ‘father’ and ‘mother’, are transcribed as 芭 (II) *pæ* and 麻 (II) *mæ*. There is some hesitation after sibilants, 𪚩₄₂₂₅ *sa*¹ {*sja*¹} ‘to kill’ is transcribed as 薩 (I) *sat*, but 𪚩₃₆₈₃ *sa*² {*sja*²} (as in 𪚩_𪚩 *sa*²*dej*¹ {*sja*²*dji*¹} ‘the day after tomorrow’) is transcribed as 薛 (IV₃) *siet*. This systematic mismatch between Chinese grades and Tangut grades in the Chinese rendering of Tangut is schematized in Figure 1.

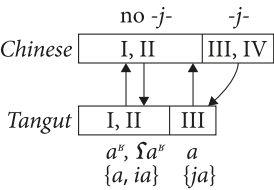


Figure 1. Chinese grades and Tangut grades

This situation is inconsistent with the traditional reconstruction {-ja} for R.20: there is no reason why a Chinese yod should not be used to render the Tangut yod. The uvularization hypothesis, on the other hand, gives a plausible explanation to the situation. Under this explanation, in mediaeval Hexi Chinese, Grades I/II and Grades III/IV are differentiated both by a vowel distinction and medial yods. In Tangut, on the other hand, the uvularization leads to a difference in vowel quality that bidirectionally renders the Chinese vowel distinction between I/II and III/IV, but there is no yod in Grade III. In Chinese-Tangut description, Tangut yodless Grade-III syllables are used to transcribe Chinese Grade III/IV syllables with yods, on account of the vocalic similarity in the absence of better alternatives. On the other hand, the Tangut lack of -j- before the vowel *a* is salient to the Chinese phonology, so they were perceived as more similar to Chinese Grade-I/II syllables without -j-.

5.4 Elimination of *-j-* and pre-Tangut

The uvularization hypothesis also removes some comparative-etymological problems caused by the Grade-III *-j-*. In Jacques (2014), medials *-i-* and *-j-* under the Sofronov-Gong interpretation are mostly projected back to Pre-Tangut, the reconstructed immediate ancestor of Tangut. However, besides this *-j-* reconstructed on the basis of Tangut grade, comparative evidence seem to imply in some cases the existence of a real yod.

For example, 𐞗₂₂₆₂ *džow*¹ {*džjow*¹} ‘to fly’ is considered by Jacques (2014) as cognate to Japhug /-nuqambu**mbjom**/ ‘id.’, cf. Zbu /-qelⁿbjém/, Burmese *pyam*. In order to invoke the correspondence between the palatal initial in Tangut and the /mbj-/ or /pj-/ initial in other languages, Jacques (2014) reconstructed a pre-Tangut consonant cluster *mbj: *mbjVm. On the other hand, the word 𐞗₅₃₆₂ *bej*² {*bjij*²} ‘penis’ has an initial *bj-* according to the traditional reconstruction; the *-j-* of the Grade III, projected back as is, gives a “phantom yod”²⁸ in the pre-Tangut reconstruction: *mbjej. However, unlike for ‘to fly’, where the pre-Tangut *mbj- corresponds to a coalesced *dž-* in Tangut, the ‘penis’ word corresponds to words with a *b-*, cf. Japhug /tu-**mbu**/, Zbu /tə-ⁿbí?/. The preponderance of the *mbj-: *b-* correspondence leads Jacques (2014: 199) to characterize the ‘to fly’ comparison as “problématique”.

With the elimination of Grade-III *-j-* according to the uvularization hypothesis, there is no motivation to have the phantom yod in ‘penis’ anymore. The Pre-Tangut of these two words can be revised into *mbjVm for ‘to fly’ and *mbej for ‘penis’. Pre-Tangut *mbj- > *dž-*, and *mb- > *b-* without much problem.

6. Conclusion

This essay proposes the uvularization hypothesis, recapitulated in Table 14, by which the Tangut language is reconstructed with a phonemic distinction between uvularized and plain syllables. The presence of uvularization, in particular, conditions uvular allophones of velar initial consonants.

By eliminating Grade-III *-j-*, this revision eliminates most of the transcriptional and comparative problems associated with the traditional reconstruction. The revised transcription is more pronounceable, natural, and typologically in line with Modern Qiangic languages.

28. Thanks to Marc Miyake for this phrasing.

Table 14. The uvularization hypothesis

Tangut Grade	Revision proposal	Tangut example	Inferred Tibetan transcription ²⁹	Japhug cognate	Revision
Grade I {-Ø-}	{CV} → CV ^ʷ	𐞪 ₀₆₃₀ ‘to weave’	* <i>gla</i> ’	/-taʁ-/	{ <i>la</i> ^ʰ } → <i>la</i> ^{ʷ1}
	{KV} → QV ^ʷ	𐞪 ₄₉₃₅ ‘needle’	* <i>gha</i> , * <i>dga</i>	/taqaβ-/	{ <i>ya</i> ^ʰ } → <i>ɣa</i> ^{ʷ1}
Grade II {-i-}	{CiV} → CŪV ^ʷ	𐞪 ₂₄₇₅ ‘to break’	* <i>phar</i>	/-prɣt-/	{ <i>phia</i> ^ʰ } → <i>phɣa</i> ^{ʷ1}
	{KiV} → QŪV ^ʷ	𐞪 ₄₆₈₀ ‘ploughshare’	* <i>khar</i>	/qraʁ-/	{ <i>khia</i> ^ʰ } → <i>qhɣa</i> ^{ʷ2}
Grade III {-j-}	{CjV} → CV	𐞪 ₄₂₂₅ ‘to kill’	* <i>sa</i>	/-sat-/	{ <i>sja</i> ^ʰ } → <i>sa</i> ^ʰ
	{KjV} → KV	𐞪 ₄₀₀₃ ‘draw (water)’	* <i>kha</i>	/kaβ-/	{ <i>khja</i> ^ʰ } → <i>kha</i> ^{ʰ2}

The existence of grades in Tangut is largely ignored in Jacques’ (2014) etymological work. He took rhyme groups as basis for comparison and projected Tangut medials back to pre-Tangut. The near-perfect correspondence discovered in this essay gives a validation both towards the phonological reality of grades as they stand in Hwang-cherng Gong’s reconstruction, and to the solidity of Tangut-Rgyalrongic cognates found by Jacques. Further advances in Tangut studies can safely depend on both bodies of reliable philological work.

In § 4.2 and § 5.1, a first attempt is made to provide a typology for GUTTURAL SECONDARY VOCALIC ARTICULATIONS in Qiangic. Unlike acoustically comparable ATR/RTR contrasts in 9/10-vowelled African languages and Eastern “Altaic” languages, in which the ATR vowels are usually more marked than RTR vowels, in Qiangic languages, plain vowels are less marked than uvularized/velarized vowels. This essay underlines the typological importance of the GUTTURAL SECONDARY VOCALIC ARTICULATIONS in Qiangic and calls for detailed instrumental studies for other living Qiangic languages that exhibit this contrast.

Finally, Hwang-cherng Gong’s observation (2007) that Old Chinese *-j- corresponds with Tangut -j- in Chinese-Tangut cognates acquire entirely different implications under the light of the hypotheses proposed in this essay. If Hwang-cherng Gong’s hypothesis is correct, the A/B contrast in Old Chinese, now often reconstructed as pharyngealization (Norman 1994; Baxter & Sagart 2014), would be directly cognate with what I reconstruct here as Tangut uvularization. The

29. The hypothetical Tibetan transcription is inferred from the following data (Chung-pui Tai 2008): 𐞪₅₄₀₄ *la*¹ ‘to record’ <gla>; 𐞪₅₈₅₆ *ya*² (locative postposition) <k+ha>, <gha>, <dga>; 𐞪₂₇₃₆ *biaa*² (transliteration for 馬mǎX) <bar>; 𐞪₅₀₄₀ *kiaa*² ‘patch’ <bkar>; 𐞪₁₁₀₀ *tshja*² ‘to repay’ <tsha>; 𐞪₃₉₄₈ *kjaa*¹ (Skt. *kā* as in *kāli*) <ka>; 𐞪₂₅₃₉ *kja*¹ ‘fear’ <ka>, <dka>.

potential reality of this hypothesis, which can only be decided with yet better descriptive and comparative work on modern Qiangic languages, holds revolutionary implications for Sino-Tibetan.

Acknowledgements

I first took notice of the Tangut yod problem in autumn 2010, when I was introduced to a group of, in their words, “Tangut fans” (David Boxenhorn, Andrew West, Nathan Hill, Marc Miyake, Alan Downes). When shortly afterwards I received the sad news of Professor Hwang-cherng Gong, I wrote about his legacy and decided that the yod problem would be a natural continuation of his work. I stumbled on the solution four years later, while browsing Guillaume Jacques’ work (2014) on Tangut etymology. It was subsequently presented in a workshop celebrating his habilitation. I finally sent this essay to Language and Linguistics, in particular thinking of the late Prof. Hwang-cherng Gong, who gave the modern treatment of Tangut grades, Jackson T.-S. Sun and Jonathan Evans, who contributed to the establishment of existence of GSA in modern Qiangic languages, as well as Ying-chin Lin, to whom I owe a shared suspicion of the yods and a heap of Tangut printouts. Let this essay, whose conception followed me along in my whole career as a student of linguistics, be a testimony to my incredible *iân-hûn* with Tangut and Qiangic scholarship. This essay benefitted from the participants in the workshops “Reconstruction et classification des langues sino-tibétaines” (2014, INALCO, Paris), and “Tangut studies” (2015, Centre for the Study of Manuscript Cultures, Hamburg). I wish to thank the anonymous reviewers, Guillaume Jacques, Marc Miyake, Nathan Hill, Alexis Michaud, Nathaniel Sims, Shintaro Arakawa, Kirill Solonin, and Mikhail Sofronov for their useful comments. I also wish to thank Sergey Dmitriyev who went through a lot of trouble in transmitting Sofronov’s comments. I would like to acknowledge the support of the Project ANR-Corpus HimalCo (ANR-12-CORP-0006) directed by Guillaume Jacques, as well as that of European Research Council, under the auspices of ‘Beyond Boundaries: Religion, Region, Language and the State’ (ERC SynergyProject 609823 ASIA).

Abbreviations

ATR	ADVANCED TONGUE ROOT
EMC	Early Middle Chinese
EWTS	(THL) Extended Wylie Transliteration Scheme
GSA	GUTTURAL SECONDARY VOCALIC ARTICULATIONS
LMC	Late Middle Chinese
RTR	RETRACTED TONGUE ROOT

Appendix. Revised reconstruction of Tangut according to the
uvularization hypothesis

1. *Initials*

k, kh, g, ŋ: pronounced as uvular consonants (*q, qh, ɢ, ɳ*) before uvularized (Grade I & II) rhymes, and velar consonants (*k, kh, g, ŋ*) before plain (Grade III) rhymes.
tś, tśh, dź, ś, ź: pronounced as retroflex consonants ([tʂ], [tʂh], [dʂ], [ʂ], [ʐ]) before Grade II rhymes, and palato-alveolar or alveolo-palatal consonants ([tɕ], [tɕh], [dɕ], [ɕ], [ʑ]) before Grade III rhymes. The current transcription remains the noncommittal *tś, tśh, dź, ś, ź*.

2. *Rhymes*

Grades: -V^ʷ, -ŋV^ʷ, -V, (-V)

Shè	Short	Tense	Retroflex	Long	Long retroflex
<i>u</i>	1. -u ^ʷ	61. -u ^ʷ	80. -u ^ʷ r	5. -uu ^ʷ	
	4. -u ^ʷ	62. -u	81. -ur	6. -uu	
	2. -u			7. -uu	
	3. -u				
<i>ũ</i>	104. -ũ ^ʷ				
<i>i</i>	8. -i ^ʷ	68. -i ^ʷ	82. -i ^ʷ r	12. -ii ^ʷ	99. -ii ^ʷ r
	9. -ŋi ^ʷ	69. -ŋi ^ʷ	83. -ŋi ^ʷ r	13. -ŋii ^ʷ	101. -iir
	10. -i	70. -i	84. -ir	14. -ii	
	11. -i				
<i>ĩ</i>	15. -ĩ ^ʷ				
	16. -ĩ				
<i>a</i>	17. -a ^ʷ	66. -a ^ʷ	85. -a ^ʷ r	22. -aa ^ʷ	88. -aa ^ʷ r
	18. -ŋa ^ʷ	67. -a	86. -ŋa ^ʷ r	23. -ŋaa ^ʷ	89. -aar
	19. -a		87. -ar	21. -aa	
	20. -a			24. -aa	
	105. -wa				
<i>ã</i>	25. -ã ^ʷ				
	26. -ŋã ^ʷ				
	27. -ã				
<i>ə</i>	28. -ə ^ʷ	71. -ə ^ʷ	90. -ə ^ʷ r	32. -əə ^ʷ	100. -əə ^ʷ r
	29. -ŋə ^ʷ	72. -ə	91. -ŋə ^ʷ r	33. -əə	
	30. -ə		92. -ər		
	31. -ə				
<i>ej</i>	34. -e ^ʷ j	63. -ŋe ^ʷ j	77. -e ^ʷ jr	38. -ee ^ʷ j	
	35. -ŋe ^ʷ j	64. -ej	78. -ŋe ^ʷ jr	39. -ŋee ^ʷ j	
	36. -ej		79. -ejr	40. -eej	
	37. -ej				
<i>əj</i>	41. -ə ^ʷ j	76. -ŋə ^ʷ j			
	42. -ŋə ^ʷ j	65. -əj			
	43. -əj				

Shè	Short	Tense	Retroflex	Long	Long retroflex
iw	44. -i ^ʁ w		93. -i ^ʁ w ^r	48. -i ^ʁ w	
	45. -i ^ʁ w		94. -i ^w r	49. -i ^w	
	46. -i ^w				
	47. -i ^w				
o	51. -o ^ʁ	73. -o ^ʁ	95. -o ^ʁ r	54. -oo ^ʁ	102. -oo ^ʁ r
	52. -ʃo ^ʁ	74. -ʃo ^ʁ	96. -ʃo ^ʁ r	55. -ʃoo ^ʁ	103. -oor
	53. -o	75. -o	96. -or	55. -oo	
	50. -wo				
ow	56. -o ^ʁ w		97. -o ^ʁ w ^r	59. -oo ^ʁ w	
	57. -ʃo ^ʁ w		98. -ow ^r	60. -oo ^w	
	58. -ow				

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Publication history

Date received: 1 May 2017
Date accepted: 2 July 2018
Published online: 2 April 2020