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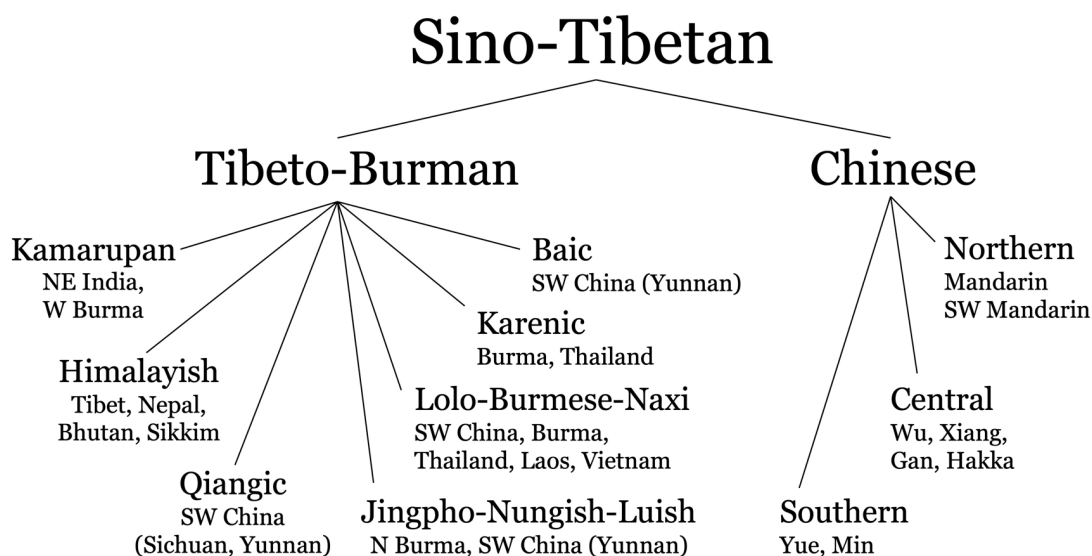
Chapter 46 (medium: 6000 words): *Sino-Tibetan*

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46.1. Introduction

This chapter provides an overview of vowel harmony (VH) systems in the Sino-Tibetan language family (also known as Tibeto-Burman or Trans-Himalayan). The traditional term “Sino-Tibetan” (ST), adopted in this chapter, refers to the two best-known languages in the family: Chinese (or Sinitic) and Tibetan. The Chinese sub-family includes all Sinitic language, whereas the term “Tibeto-Burman” (TB) refers to the non-Sinitic subset of the family and includes various language groups such as Tibetic (or Himalayish), Lolo-Burmese, Karenic, and Qiangic (see Chart 46.1).

Chart 46.1: Sino-Tibetan languages (adapted from Matisoff 2003: 5)



In view of the extensive distribution of ST (from Northeast India to the Southeast Asian peninsula) and the large number of ST languages (over 250), VH in this language family is at best marginal. Attested cases of VH occur mainly in one geographical area (southwest and west China), where three subgroups of the TB sub-family overlap.¹ These three subgroups are

¹ In different TB languages outside of that area, one can also sporadically find examples of VH, mostly in the form of fossilized processes of vowel assimilation (such as rich allomorphy patterns of nominal prefixes in Tani languages, Post & Sun 2017: 326). Some productive patterns of VH have also been reported (as in Dolakha Newar, Genetti 2007: 58-61), however, they appear to be subject to considerable inter-speaker variation.

Qiangic and Na (aka Naxi) languages (spoken in Sichuan and Yunnan Provinces), and Tibetic languages (in particular those spoken in the Tibetan Autonomous Region).² Among these subgroups, VH is most commonly attested in Qiangic. It is even considered an essential feature of this subgroup in its traditional definition (Sun 2001).³ VH systems are also common in the geographically adjacent Na languages. By contrast, among Tibetic languages, VH is mainly attested in Dbus-gtsang varieties, such as Lhasa or Shigatse Tibetan.⁴

Given that there is no clear-cut evidence of VH in written Tibetan, which is the oldest written TB language, VH systems in TB are probably recent independent developments in the subgroups where it is attested.⁵ VH systems in Qiangic, Na, and Tibetic languages share broad similarities, but also important differences. Similar features include:

- (i) VH in Qiangic, Na, and Tibetic languages only applies in sequences of two adjacent syllables, most of which are words or, less commonly, combinations of words with enclitics;
- (ii) all have both affixal and compound structures as harmonic domains;
- (iii) VH is generally root-controlled in affixal structures and dominant/recessive in compound structures;
- (iv) there appear to be no restrictions on a certain level/stratum, where VH can occur;
- (v) attested systems mostly disregard the consonants that intervene between the harmonizing vowels.

Differences between VH systems in these three subgroups relate to (i) types of VH, (ii) the relative prominence of the harmony domains (affixal vs. compound), and (iii) the identity of affected segments.

² Tibetic languages of China are traditionally divided into three groups: Dbus-gtsang (or Central), Kham, and Amdo, which correspond to the three namesake historical provinces of Tibet. Tibetic languages spoken in the Tibetan Autonomous Region of the People's Republic of China belong to the Dbus-gtsang group.

³ The term "Qiangic" is here used in its broadest sense, as referring to the thirteen, geographically adjacent and little-studied TB languages of Southwest China. Twelve of these languages are still spoken (e.g., Qiang, rGyalrong, Lavrung, Muya or Minyak, Pumi or Prinmi, Guiqiong, Ersu), and one is extinct (Tangut). Qiangic is a relatively little-studied and a highly heterogeneous subgroup, which can be further subdivided into a few more homogeneous language clusters, such as rGyalrongic (including rGyalrong proper, Lavrung and Horpa) and Ersu-Lizu-Duoxu.

⁴ VH has also been described for Balti (Sprill 1972, 1980) and the Eastern Admo Tibetan dialect of Ndzorge of northern Sichuan Province (Sun 1986: 73-84).

⁵ Miller (1966) explores VH in the early written records of Tibetan; for a reply, see Ulving (1972).

(i) Qiangic languages exhibit many different types of VH, including backness (palatal) (see chapter 4a), ATR (see chapter 4d), round (labial) (see chapter 4b), height (see chapter 4c), and retroflex harmony (see chapter 4g). It is also common to find in one Qiangic language mixed harmony systems in which more than one type of VH is present. Most common are combinations of backness and height harmony. In Na languages, backness harmony is reported to be most common, but height harmony is also found. The main type of VH in Tibetic language is height harmony.

(ii) In Qiangic and Na languages, VH is most common in affixal domains, whereas in Tibetic languages it is most common in compounds.

(iii) Cases of productive VH in Qiangic are associated with the following affixes and environments:

(a) several types of ST derivational affixal and clausal morphology, such as the preverbal negative particle **ma-j*, the prohibitive particle **ta* or **da*, and, to a lesser extent, the prefix **a-* (with the function of marking kinship) (cf. LaPolla 2017)

(b) independently innovated derivational affixal morphemes, such as directional prefixes⁶

(c) combinations of the numeral ‘one’ with numeral classifiers⁷

VH in compound structures is mostly fossilized.

Na languages gravitate towards the Qiangic type, with cases of productive VH associated with affixal and clausal morphology (as in (a) above), and mostly fossilized VH in compound structures.

In Tibetic languages, VH is mainly attested in compounds, as well as with some independently innovated derivational affixal morphemes, which include positive and superlative adjectival suffixes (*-mo*, *-po*, *-shos* in Written Tibetan, hereafter WT), and enclitics (analytical case markers).

⁶ Qiangic languages have fixed classes of three to nine directional or orientation verbal prefixes. They mark the direction of the action, denoted by the verb, and are also used to convey perfectivity.

⁷ Numbers are typically bound morphemes in Qiangic languages, which are only pronounced in combination with a classifier.

VH systems in the languages of the area are relatively little-studied, because most local languages are still in the process of being documented and described. VH has been systematically investigated only for two Tibetic languages (Lhasa Tibetan: Sprigg 1961, 1966; Chang and Shefts Chang 1968; Dawson 1980: 59-87; and Shigatse Tibetan: Haller 2012), and two Qiangic languages (Qiang: Evans & Huang 2007; Sims 2011; and Stau: Gates & Kim 2018). For the remaining languages, information on VH can be found in their respective grammatical descriptions.

The remainder of this chapter provides an overview of case studies and discusses broad tendencies within and across the three subgroups.

46.2. Case studies

46.2.1. Qiangic

While all Qiangic languages have VH to different extents, ranging from productive to fossilized, there is a tendency for VH systems to simplify throughout the area of distribution of Qiangic languages, in the direction from north to south. Most complex and regular systems are held to be those of the Qiang and Muya languages (Huang 1991: 266-271). These are exemplified below on the basis of data and analysis in Evans & Huang (2007) and Sims (2011) for the Yadu variety of Qiang.

Yadu Qiang has 8 basic vowels:

Table 46.1 Basic vowels of Yadu Qiang

	front	central	back
high	i, y		u
mid	e	ə	o
low	a		ɑ

All vowels except for the schwa show a phonemic contrast in length; and all vowels may be rhotacized (e.g., when they are the final vowel of a verb with first person plural marking, which is /-i·/).

Yadu Qiang has been analyzed as having five VH processes: Back, Low, ATR, Round, and Rhotic harmony. These processes are associated with all the affixes and

environments, enumerated above for Qiangic languages, and, additionally, with some inflectional morphology (such as first person singular and plural marking). Low, ATR, and Rhotic harmonies are regressive, whereas Back and Round harmonies apply bidirectionally.

The Back harmony is argued to be the most basic of the five VH processes. All basic vowels can be divided into front (i, y, e, a) and back (ə, u, o, ɑ) classes. Vowels in affixes (e.g., the first singular suffix in examples 1-2) are either fronted or backed in order to agree with the specification for [back] of the root vowel:⁸

- | | | | |
|--------|---|----|-------------------------------|
| (1) a. | p ^h i-a [p ^h ja] (< p ^h i ‘sow’) | b. | tse-a [tsa] (< tse ‘look at’) |
| | sow-1SG | | look.at-1SG |
| | ‘I am sowing’ | | ‘I am looking at’ |
| | | | |
| (2) a. | p ^h u-a [p ^h wa] (< p ^h u ‘run, flee’) | b. | tσα-a [tsa] (< tσα ‘ride’) |
| | run-1SG | | ride-1SG |
| | ‘I am running’ | | ‘I am riding’ |

Back harmony further interacts with Low harmony (a, ɑ are low vowels, whereas the remaining vowels are non-low). This is illustrated in example (3) with combinations of the numeral ‘one’ with classifiers:

- | | | | | | |
|--------|---------------|----|-------------|----|------------------------|
| (3) a. | e-'pe | b. | a-'kwa | c. | ɑ-'la |
| | one-bowl | | one-place | | one-CLF.elongated |
| | ‘one bowl of’ | | ‘one place’ | | ‘one stick-like thing’ |

Furthermore, in affixal structures, Back and Low harmonies apply in such a way that they do not change the affix’s specification for ATR. In Qiang the highest vowels (i, y) are analyzed as [+ATR], the lowest vowels (a, ɑ) as [-ATR], and [ATR] is argued to be distinctive for vowels that are neither low nor high. More specifically, vowels e, o are [-ATR], and vowels ə, u are [+ATR]. Consequently, all directional prefixes in this language may be divided into [+ATR] and [-ATR] sets. Vowels belonging to the [+ATR] set have the realizations [i~u~ə], whereas vowels belonging to the [-ATR] set have the realizations [e~a~o~ɑ], agreeing with

⁸ Abbreviations used in the gloss below follow the Leipzig Glossing Rules (LGR, <http://www.eva.mpg.de/lingua/resources/glossing-rules.php>). Non-standard abbreviations (those not included in the LGR) are: DIM = diminutive, H= honorific, WT = Written Tibetan.

the stem vowel with respect to backness and lowness. Compare the realization of the directional prefixes ‘upward’ ([+ATR]) and ‘downward’ ([-ATR]) in example 4:

(4)	gloss	push	enclose	push	drive	run, flee	face	chase
+ATR	upward	ti-'ɛtɛi	ti-'tɛ ^h y	ti-'le	ti-'wax	tu-'p ^h u	'tə-lə	tə-'dza
-ATR	downward	fi-'ɛtɛi	fi-'tɛ ^h y	fi-'le	fi-'wax	fi-'p ^h u	'fi-lə	fi-'dza

The rounding harmony operates bidirectionally so that vowels across syllable boundaries agree in terms of [round] (y, u, o are round vowels; whereas the remaining vowels are non-round). It is most commonly attested in native compounds and combinations of polysyllabic verbs borrowed from Chinese with the native Qiang verb *pə* ‘do’. Examples include:

(5) Native compounds (Progressive VH):

- a. /wə/ ‘bird’ + /ʃpu/ ‘flock’ > [wu.'ʃpu] ‘(wild) pigeon’
- b. /mə/ ‘fire’ + /-xu/ ‘smoke’ > [mu.'xu] ‘smoke’
- c. /p^hə/ ‘forest’ + /xʃu/ ‘roe deer’ > [p^hu.'xʃu] ‘wild animal’
- d. /ji/ ‘two’ + /-su/ ‘ten’ > [ju.'su] ‘twenty’

(6) Compounds with loanwords from Chinese (Regressive VH):

- a. /kwa.'k^hu-pə/ [kwa.'k^hu-pu] ‘be sarcastic’
- b. /tsun.'tɛin-pə/ [tsun.'tɛin-pə] ‘respect’
- c. /ta'tʃ^he-pə/ [ta'tʃ^he-pə] ‘back up a car’
- d. /tsun.'pəj-pə/ [tsun.'pəj-pə] ‘prepare’
- e. /pe.'t^hjaw-pə/ [pe.'t^hjaw-pə] ‘chat’

Finally, rhotic harmony is a single harmony process, which occurs before a rhotic vowel. Consider examples in (7):

- (7) a. /kua/ ‘five’ + /k^he-/ ‘hundred’ > [kua.'k^he-] ‘five hundred’
- b. /me/ ‘not’ + /we-/ ‘reduce’ > [me.'we-] ‘unceasingly’

Qiang represents one of the most complex VH systems among Qiangic languages. The vast majority of Qiangic languages tend to have simpler VH systems, where VH is manifest primarily in the form of vowel alternations in prefixal domains. These typically include

combinations of verb stems with directional, negative, prohibitive, and interrogative prefixes and those of the numeral ‘one’ with a numeral classifier. VH systems are of root control type, the stem vowels spreading harmony leftward in the direction of prefixes and the numeral ‘one’ (regressive). Both mixed harmony and singular harmony systems are found. These are illustrated below with examples from the Guiqiong and Ersu languages.

Guiqiong (based on Rao 2015: 63-67; see also Jiang 2015: 58-60) exhibits both a backness and a height harmony. Table 46.2 presents basic vowels of this language:

Table 46.2 Basic vowels in Guiqiong

Oral vowels	Front	Central	Back
Close	i, y		ɯ, u
Close-mid		ə	
Open-mid	ɛ		ɔ
Open			ɑ

All vowels except /y/ and /ɔ/ have nasal counterparts. In addition, there is one nasal vowel without an oral counterpart, /æ̃/.

The vowels can be divided into three classes, characterized by the features [\pm front] and [\pm height]. The primary division is based on the feature [\pm front]; non-front vowels are further differentiated on the basis of the feature [\pm height]. Depending on the feature(s) of the stem vowel, the vowel of the prefix or that of the numeral ‘one’ may have one of the following realizations: [$\varepsilon \sim \partial \sim \alpha$]. Table 46.3 summarizes the three vowel classes in Guiqiong, their features, and the corresponding realizations of the prefix vowels. These are exemplified by combinations of the numeral ‘one’ with numeral classifiers:

Table 46.3 VH alternations in Guiqiong

Feature		Vowel class	VH form	Example
[+ front]		i, ɛ, y, ĩ, ĩ̃, æ̃	ɛ	tɛ ³³ pi ⁵³ ‘one person’ tɛ ³³ γɛ ⁵³ ‘one group of soldiers’ tɛ ³³ khɛ̃ ⁵³ ‘one room’
[- front]	[+ high]	u, ə, ɯ, ũ, ɔ̃	ə	tə ³³ pu ⁵³ ‘one tree’ tə ³³ t ^h ə ⁵³ ‘one book’

				tə ³³ zu ⁵⁵ wu ³³ ‘one bucket of water’ tə ³³ kũ ⁵³ ‘one flower’
[- front]	[- high]	ɔ, a, ǎ	a	tə ³³ tɛ ^{hɔ} ⁵³ ‘one bunch of vegetables’ tə ³³ p ^h a ⁵³ ‘one bottle’ tə ⁵⁵ kwǎ ⁵³ ‘one stick’

Ersu (based on Chirkova et al. 2015; see also Zhang 2013: 92-94) presents yet a simpler system with only one process: Low harmony. Ersu has eight basic vowels, outlined in Table 46.4.

Table 46.4 Basic vowels of Ersu

Oral vowels	Front	Central	Back
Close	ɹ		ɻ
Close-mid		ə̣	o
Open-mid	ɛ		
Open		a, ạ	

All vowels can be grouped into low and non-low. Corresponding vowel realizations in verbal prefixes and the numeral ‘one’ are [a~ɛ], as further detailed in Table 46.5.

Table 46.5 VH alternations in Ersu

Feature	Vowel class	VH form	Example
[+ low/open]	a, ạ	a	tá ká ‘one strip’ Ntɕ ^h ɛ̀ tà pá ‘one grain of rice’ k ^h á-lá ‘to come in (in the direction to the speaker)’
[-low/open]	í, ɛ, o, ɹ, ɻ	ɛ	té p ^h ó ‘one set (of clothing)’ té p ^h ý ‘one tree; ten cents’ té ɖz̥z̥ ‘one sentence’

			k ^h é-jí ‘to enter (in the direction away from the speaker)’
--	--	--	---

While existing descriptions of Qiangic languages seem to suggest that VH harmony in Qiangic is more common in affixal (prefixal) domains, a recent study of a Northern Qiangic (rGyalrongic) language Stau (Gates & Kim 2018) argues that in that language, VH is mainly manifest in compounds. Stau has 8 basic vowels, summarized in Table 46.6.

Table 46.6 Basic vowels of Stau

	Front	Central	Back
close	i		u
mid	e ε	ə	o
open	æ		ɑ

It is argued that disyllabic compounds in this language evidence grouping of vowels into three pairs in terms of correlative distance of F1 and F2, that is, /e/-/ε/, /æ/-/ɑ/, and /o/-/u/. Evidence for the fourth vowel pair /i/-/ə/ is less straightforward, because attested cases of [iCi] are often in free variation with [əCi]. In each of these pairs, one vowel is lower and more back or higher and more forward relative to the other vowel. These pairs are said to undergo regressive vowel harmony when morphemes are combined to create complex words. More specifically, if the vowels of the two morphemes belong to the same vowel pair set, the vowel of the first morpheme assimilates to the vowel of the second. Relevant processes are summarized in Table 46.7.

Table 46.7 Vowel harmony in Stau

Raising/Fronting	/əCi/ > [iCi]	/εCe/ > [eCe]	/oCu/ > [uCu]	/ɑCæ/ > [æCæ]
Lowering/Backing	/iCə/ > [əCə]	/eCε/ > [εCε]	/uCo/ > [oCo]	/æCa/ > [ɑCa]

Supporting evidence mainly comes from lexical words (see examples in 8 and 9), which are reported to exhibit a remarkable lack of disharmonic combinations, such as [*əCi], [*εCe], [*ɑCe], [*oCu], and [*iCə].

(8) Raising/Fronting

[əCi] & [iCi]	[eCe]	[uCu]	[æCæ]
free variation [scəki] ~ [sciki] 'look'	[veqe] 'rabbit' [rele] 'turnip'	[lup ^h u] 'deciduous tree' [skulu] 'leather rope'	[ætæ] 'elder sister' [n ^h ææ] 'play'

(9) Lowering/Backing

[əCə]	[εCε]	[oCo]	[aCa]
[ɰzəpə] 'body' [tsələ] 'cat'	[rnemε] 'finger' [mεrεv] 'impolite' (WT <i>ma rabs</i>)	[fεoro] 'scrape' [q ^h osto] 'back'	[rbala] 'leaf' [ndzala] 'climb'

Factors blocking effects VH in Stau include velar and uvular consonants (which do not co-occur with front vowels), and consonant clusters or affricates in the middle of a root. For example, in the words [pə-sɲi] this-day 'today' and [ndzə-sɲi] two.before-day 'the day before yesterday', the vowel /ə/ of the first syllable is then not raised/ fronted to [i].

This system of VH appears to have parallels in some closely related varieties of Stau, such as Gexi Horpa (Tian 2019 p.c.), which appears to have some traces of a similar process in lexical words. Consider examples in (10) and (11):

(10) g_Λ- intensifying prefix

- | | | |
|--------------------------|--------------------------|---|
| a. gi-ɣri
'very many' | b. ge-de
'very small' | c. ga-ca
'very comfortable/pleasant' |
|--------------------------|--------------------------|---|

- | | |
|---|--|
| (11) a. ɣr _Λ -m _Λ (< ɣrə 'water')
water-well
'well' | b. ja=ɰa (< jo 'house')
house=LOC
'on the house' |
| c. rdə-rbə (< rdo 'stone')
stone-pile
'stone pile' | d. ts ^h e-ze (< ts ^h Λ 'goat')
goat-DIM
'lamb' |

Conversely, another closely related variety of Stau, Geshiza (Honkasalo 2019: 193-194), lacks any major VH that would be similar to VH in Stau. Nevertheless, Geshiza vowels do

not appear freely in disyllabic lexical words. The most prominent vowel combinations in Geshiza include [**iCe*], [**eCi*], [**aCæ*], [**iCæ*], and [**eCə*], whereas existing vowel combinations are [*iCi*] (as in *ɛ^{hi}ɛ^{hi}* ‘slowly’), [*eCe*] (as in *amele* ‘noodles’), [*æCæ*] (as in *zɔæjæɭ* ‘curtains’), [*eCæ*] (as in *nrekær* ‘take turns’), and [*iCə*] (as in *rdivə* ‘bullet’).

The case of Stau, Gexi Horpa, and Geshiza is symptomatic for other Qiangic languages where, if examined across closely related varieties, VH systems appear present to different extents.

To give another example, the synchronically productive lowering harmony of Ersu discussed in this section is present only in the form of traces in the closely related sister language of Ersu Lizu (Chirkova and Chen 2013). Similar to Ersu, Lizu has 8 basic vowels: /i, y, e, ə, æ, ɐ, u, o/, with a distinction between a front and a back *a* (æ ɐ). Dissimilar to Ersu, verbal prefixes and the numeral ‘one’ in Lizu have invariant forms with the vowel e (e.g., *tê* ‘one’, *de-* ‘upward’, as in *dê-ji* [dê-ji] upward-go ‘go up’), and only in a few verbs with the root vowel /ɐ/, the vowel of the prefix may assimilate to it in lowness and backness. Consider examples in (12):

- | | |
|---|----------------------|
| (12) a. /dê-q ^{hɐ} / [dê-q ^{hɐ}] | b. /ne-NGê/ [nɐ-NGê] |
| upward-be.bitter | downward-stab |
| ‘be bitter’ | ‘stab, kill, jab’ |

In sum, Qiangic languages are rich in diverse and complex types of VH systems. Backness and Height harmony are among most basic types. There is a tendency towards simplification of VH systems across Qiangic languages (from north to south) as well as across closely related varieties of one Qiangic language. This can be tentatively taken as indicating progressive disappearance of VH in this group.

46.2.2. Na Languages

In Na languages, VH is associated with a restricted set of environments. For example, in Yongning Na (Lidz 2010: 96-105), VH only occurs with the nominal kinship prefix *a³³⁻*, some verbal prefixes (such as the interrogative prefix *a^{3ʹ-}*, the negative prefix *mə³³⁻*, the accomplished prefix *lə³³⁻*, the durative prefix *t^hu³³⁻*), and the conjunction *la³³*. The direction of vowel assimilation is regressive. VH patterns are less uniform than those of Qiangic languages, different prefixes having different numbers of forms conditioned by VH.

Yongning Na has 9 basic vowels, summarized in Table 46.8.

Table 46.8 Basic vowels of Yongning Na

	Front	Central	Back
close	i		ɯ, u, ʏ
mid	ɛ	(ə)	ɤ, ɔ
	æ		
open			ɑ

The interrogative prefix a^{33} - has two allomorphs, which agree with the stem vowel with respect to backness. Consider examples in (13):

- (13) a. [æ³³-ts^hɛ³³] ‘what, how’ b. [æ³³-yi³³] ‘perhaps, maybe’ c. [ɑ³³-tsɔ³³] ‘what’

By contrast, the kinship prefix a^{33} - shows a more complex three-way distinction, having front, central-back, and back allomorphs. Table 46.9 outlines relevant features and trigger vowels, and provides illustrative examples.⁹

Table 46.9 VH alternations in the kinship prefix in Yongning Na

Feature	Trigger vowel	VH form	Example
[+ front]	i	æ ³³ - ~ ɛ ³³ -	æ ³³ -mi ³³ ‘mother, aunt’ ɛ ³³ -tei ³¹ ‘aunt’
[+back]	u, ʏ, ɔ, ɑ	ɑ ³³ -	ɑ ³³ -mu ³³ ‘older sibling’ ɑ ³³ -p ^h ɣ ³³ ‘grandfather’ ɑ ³³ -mɔ ¹³ ‘grandmother’ ɑ ³³ -dɑ ³³ ‘father’
[+back]	ɯ, ɤ, ɔ	ə ³³ -	ə ³³ -su ³³ ‘great grandparents’

⁹ Note that the vowels in the column “Trigger vowel” are the only vowels that occur on roots that take the kinship prefix.

centralized			ə ³³ -ɛɾ ¹³ ‘girlfriend (impolite term)’ ə ³³ -ɣu ³³ ‘uncle’
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The negative prefix *mə³³-* has four allomorphs: the front allomorph [mæ³³-] (as in [mæ³³=si³³] ‘not know’), the back allomorph [mɑ³³-] (as in [mɑ³³=t^hɑ³³] ‘not tolerate’), the high back rounded allomorph [mɔ³³-] (as in [mɔ³³=fu³³] ‘unhappy’, [mɔ³³=zɔ³³] ‘not use’), and the central allomorph mə³³-. However, in the case of the latter, it is stated that “the magnetic pull of [VH] is weak with the mid and high back rounded vowels, and these vowels often remain opaque to vowel harmony” (Lidz 2010: 100). Consider examples in (14):

- (14) a. mə³³=ku¹³ b. mə³³=mu¹³ c. mə³³=hwæ³³
 NEG=can NEG=be.ripe NEG=be.comfortable
 ‘impossible’ ‘unripe’ ‘uncomfortable’
- d. mə³³=hɔ³¹
 NEG=be.correct
 ‘incorrect’

Finally, the accomplished prefix *lə³³-* harmonizes based on height rather than on backness. Among its three allomorphs, [læ³³-] attaches to verb stems with the low vowels æ and ɑ (as in [læ³³-bæ³³] ‘row’, [læ³³-bɑ³³] ‘open up’); [lɛ³³-] is used with verb stems with a high vowel (i, u, y, as in [lɛ³³-ɲi³³ zɛ³³] ‘be full’, [lɛ³³-ʂu³³] ‘die’); and [lɔ³³-] is used with verbs with mid-vowels (ɛ, ɾ, ɔ, as in [lɔ³³-sɛ³³] ‘finish’, [lɔ³³tɔ³³] ‘see, look’).

VH also occurs in compounds (both productively and as an unproductive fossil).

Examples include:

- (15) a. /mɔ³³-wɔ³³/ ‘heavens’, from /mɣ³³/ ‘sky’ and /wɔ³³/ ‘above’
 b. [ɲæ³³-tæ³³-mi³³] ‘horizontal-eyed woman’, from /ɲɑ³³/ ‘eye’, /tæ³³/ ‘horizontal’, /mi³³/ ‘woman’

On the whole, VH patterns in Na languages tend to be more idiosyncratic and unpredictable than in Qiangic languages.

46.2.3. Tibetic

Height harmony can be seen as the main VH process in Lhasa and Shigatse Tibetan. The basic principle is that all vowels in any given word should agree in height. The [+high] vowels can be either underlyingly high or be the output of the process of raising.

Table 46.10 provides inventories of plain vowels in Lhasa Tibetan (left) and in Shigatse Tibetan (right). The overview below is based on the analysis of VH harmony systems in Shigatse and Lhasa Tibetan by Haller (2012).

Table 46.10 Basic vowels of Lhasa Tibetan (left) and Shigatse Tibetan (including the diphthong *ie*) (right)¹⁰

Lhasa Tibetan		
	Front	Back
Close	i y	u
Close-mid	e ø	o
Open-mid	ɛ	
Open		a

Shigatse Tibetan		
	Front	Back
Close	i y	u [ʊ]
Close-mid	e	
Open-mid	ie œ	o [ɔ]
Open		a

The basic vowels in both varieties can be divided into two classes:

- (a) high vowels
- (b) non-high vowels

The two classes of vowels in each variety are presented in Tables 46.11 and 46.12.

Table 46.11 Harmonic alternant pairs of Lhasa Tibetan

High vowels	i	y	u	[ə]	
Non-high vowels	e	ɛ	ø	o	a

Table 46.12 Harmonic alternant pairs of Shigatse Tibetan

High vowels	i	y	u	[ə]
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¹⁰ Note that Shigatse Tibetan does not have the vowel *ɛ* in its basic system. Its closest counterpart to *ɛ* in Lhasa Tibetan is the diphthong *ie*, which consists of *i* and its harmonic alternant *e*, hence being the unrounded vowel closest to *ɛ*.

Non-high vowels	e	œ	o	a
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The formation of harmonic alternant pairs is likely to have been conditioned by the features [+/- back] and [+/- round], as detailed in Table 46.13:

Table 46.13 Features of harmonic alternant pairs of Lhasa and Shigatse Tibetan

Feature		Vowel
[-back]	[-round]	i, e
[-back]	[+round]	y, œ
[+back]		u, o

In this division, the low/open vowel *a* does not have a corresponding pair. To correct for this gap, both varieties developed a high vowel that could serve as a harmonic alternant for that vowel: the schwa. (Note that the schwa does not have a phonemic status in both varieties, being the result of a raising process.) In Lhasa Tibetan, *ɛ* is further paired to *i*, whereas the corresponding diphthong *ie* in Shigatse Tibetan is neutral in that it causes raising under certain conditions but it is not itself affected by VH. For example, in the compound *liɛwã* ‘power of fate’, in which the direction of assimilation is regressive, *ie* in the first syllable (*liɛ* ‘fate’), does not undergo change.¹¹

In both varieties, vowels are raised in any word, which contains a high vowel. VH is dominant/recessive, with a further stress/tone condition. For example, VH in Shigatse Tibetan is tone-dependent. More specifically, the direction of vowel assimilation depends on whether the second syllable carries a tone. If it does, vowel assimilation is regressive, as can be seen in the following examples:

- (16) a. *mì* ‘eye’ + *ɛē:(kō)* ‘glass’ > *mīkɛē:* [mēkɛē:] ‘glasses’
 b. *p^hœ* ‘Tibet’ + *rì* ‘race’ > *p^hœrì* [p^hyrì] ‘Tibetan (person)’
 c. *ŋū:* ‘silver, money’ + *sō* ‘work’ > *ŋū:sō* [ŋō:sō] ‘wrought silver’
 d. *tɛ^hà* ‘hand (H)’ + *ŋū:* ‘silver, money’ > *tɛ^hā:ŋū:* [tɛ^hō:ŋō:] ‘money (H)’

¹¹ The four tonemes of Shigatse Tibetan are indicated by the following tone marks: *ā* (high level tone), *à* (high falling tone), *ɑ* (low level tone), *ḁ* (low falling tone). Toneless syllables are unmarked.

Words with *a* as the vowel of the second syllable are an exception to the general rule of regressive assimilation because they can also undergo progressive assimilation. Consider the following examples:

- (17) a. *tʰù* ‘mind (H)’ + *tʂʰā*: ‘tax’ > *tʰū:tʂā*: [tʰ̄:ʂ̄ā:] ‘sorrow (H)’ (regressive)
 b. *l̥ù* ‘sheep’ + *εā* ‘meat’ > *l̥ukεā* [l̥̄kε̄ā] ‘mutton’ (progressive)

If the second syllable in a compound is not specified for tone, as is typically the case with bound forms (such as suffixes or clitics), the direction of assimilation is regularly progressive. This is illustrated in (18) by combinations of adjectival stems with the positive suffix *-po* and the superlative suffix *-εæ*:

- (18) a. *tεām* ‘smooth’ + *-po* > *tεāmpō* ‘smooth’
 b. *kʰy*: ‘slow’ + *-po* > *kʰy:pō* [kʰ̄y:p̄ō] ‘slow’
 c. *ηār* ‘sweet’ + *-mo* > *ηā:mō* ‘sweet’
 d. *cūr* ‘sour’ + *-mo* > *cū:mō* [c̄ū:m̄ō] ‘sour’
 e. *kā* ‘good’ + *-εæ* > *kāεæ* ‘best’
 f. *r̥ij̥* ‘long’ + *-εæ* > *r̥ij̥εæ* [r̥̄ij̄ε̄ȳ] ‘longest’

With trisyllabic words, VH operates on the first two syllable in the same way as with disyllabic words, and the third syllable is assimilated progressively by the second syllable. Consider examples in (19):

- (19) a. *tεʰiè* ‘to do’ (perfective stem) > *tεʰièwata* [tεʰ̄ièw̄ətə] do.PFV:CAUS
 b. *kʰā* ‘mouth’ + *kiè* ‘language’ > *kʰākiè* [kʰ̄ākiè] ‘colloquial language’; *kʰākiè=la* [kʰ̄ākiè-lə] colloquial.language=DAT

In sum, VH in Lhasa Tibetan and Shigatse Tibetan is regular, it normally applies to compounds, and its operation is similar in these two varieties.

46.3. Concluding remarks

As the overview of case studies in section 2 suggests, VH systems in ST languages represent a complex picture. Given that attested cases of VH in ST languages are mostly restricted to distinct TB subgroups spoken in one area (Southwest and West China), VH in ST is a candidate for an areal phenomenon (see chapter 31d). A further justification for this assumption is that the area where VH systems are attested is historically multiethnic and multilingual (Chirkova 2012, 2017). For centuries it served as a migration corridor for groups of several ethnic stocks: ST, Tai-Kadai, Austro-Asiatic (Mon-Khmer), and Hmong-Mien. In addition, Altaic languages to the north of the area are historically in contact with Tibetic languages, and speakers of Altaic languages swept through Southwest China during the Mongol conquest of China in the 13th century (see chapters 48-49).

Not only is language contact a likely factor in the spread of VH in the area, it is currently also playing a role in the disappearance of VH systems, as can be seen by examining closely related varieties of one language (see chapter 32a). Contact with Mandarin Chinese (which does not have VH) and widespread bilingualism in Mandarin Chinese, the *lingua franca* in the area and the language of education and administration of China, may be one factor leading to the decline of VH systems in local TB languages.

Across the three TB subgroups discussed in this chapter, two major types of VH systems can be distinguished: on the one hand, a combination of Backness and Height harmonies (Qiangic and Na) and, on the other hand, Height harmony (Tibetic). Given differences in (a) VH types, (b) the relative prominence of the harmony domains, and (c) the identity of affected segments, VH systems in Qiangic and Na, as opposed to Tibetic languages, possibly represent independent developments.

A comparison of the sound systems of Lhasa and Shigatse Tibetan with Old Tibetan, as reflected in traditional Tibetan orthography (Written Tibetan), offers insights as to possible factors that have contributed to the development of VH in these languages. One important factor that has accompanied the rise of VH is the drastic simplification of the Old Tibetan highly complex syllable canon and the progressive loss of consonant distinctions. The earliest attested form of the Tibetan vowel system, as reflected in traditional Tibetan orthography, consists of five basic vowels *i*, *e*, *u*, *o*, and *a*. Combinations of these vowels with consonantal codas (e.g., *-b*, *-d*, *-g*, *-l*, *-r*, *-s*, *-m*, *-n*, *-ŋ*) yielded a complex system of over 70 distinct rhymes. This complex structure has been significantly simplified in the Central (Dbus-gtsang) group of dialects (including Lhasa and Shigatse Tibetan). All original consonantal codas were lost, transforming all closed syllables into open syllables and generating innovative vowels or diphthongs. For example, the vowels *u*, *o*, and *a* became palatalized

before the denti-alveolar consonants *-d*, *-n* and *-s* in Lhasa and Shigatse Tibetan and before *-l* only in Lhasa Tibetan, thereby increasing the vowel inventory by *y*, *æ/ø* and *ɛ*. (Simplification of the syllable canon also led to the development of tones.) The development of VH could have been correlated with the increase in the number of basic vowels. Given that the effect of VH is to reduce the number of legitimate words that can be constructed from the set of sounds available, the presence of VH may make it easier to tolerate a larger than average number of different vowels in a language as it reduces the risk of mishearing and misidentifying a word (Maddieson 2013). While clearly important, this factor has most likely not been decisive in the development of VH in Tibetic languages, because VH is not attested in many Tibetic varieties which, similar to Lhasa and Shigatse Tibetan, have drastically simplified their syllable structure and developed tones (such as many Kham Tibetan varieties of China).

The importance of stress or tone as determinants for the direction of VH in Tibetic languages may be equally applicable to VH systems in Qiangic and Na languages. Recall that in those languages, VH is most commonly attested in prefixal structures, where it is regressive. This would be consistent with the fact that bound forms, such as prefixes, are normally unstressed (in languages with stress) or toneless (in tonal languages), and it is usually difficult to ascertain the quality of their vowels. In this way, the stressed or toned syllables of the stem is likely to serve as the anchor of the harmony, while the unstressed / toneless vowels of the bound form serve as the target of the harmony process. While potentially worthwhile exploring, this assumption is presently difficult to test. This is because the prosodic organization of many local languages (including those better studied, such as Qiang) has not yet been described to any great extent.

In sum, the little-studied VH systems in ST languages have the potential to contribute to the cross-linguistic typology of VH systems. The steady increase in descriptive and analytic work on ST languages with VH systems is likely to soon translate into a better understanding of their origins and development.

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