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Initial /r/ and Rhoticity in Tibetic Languages: Analysis of Syllable Structure

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Abstract: This article examines the initial consonant *r*, particularly *r* at the glide position, that contacts a vowel in its archaic forms in Tibetic languages (Tibeto-Burman, Sino-Tibetan) and describes sound correspondence in various varieties from the eastern Tibetosphere. To achieve this, we first provide a mode of syllable structure divided into initial and rhyme and demonstrate examples classified into four types, followed by the relative order of sound changes by arranging the correspondence of *r* in the syllable structure, including the cases of the initial *r* and final *r*. In particular, the type in which the r-sound influences the rhyme is discussed in detail. This article also presents a typological analysis of the r-sound based on synchronic materials from the eastern Tibetosphere, outlining the sound correspondences exhibited by *r* and the developmental processes that have shaped its various sound forms.*

Key words: rhoticity, rhoticisation, syllable structure, Tibetic, Tibeto-Burman

1. Introduction

Tibetic languages (Tibeto-Burman, Sino-Tibetan) are spoken in six Asian countries (Suzuki et al. 2022). Most of these varieties were derived from Old Tibetan, following the definition of Tournadre and Suzuki (2023), who divided them into eight sections, each named according to their geographical direction: North-western (NW), Western (W), South-western (SW), Southern (S), Central (C), North-eastern (NE), Eastern (E), and South-eastern (SE); see Figure 1.

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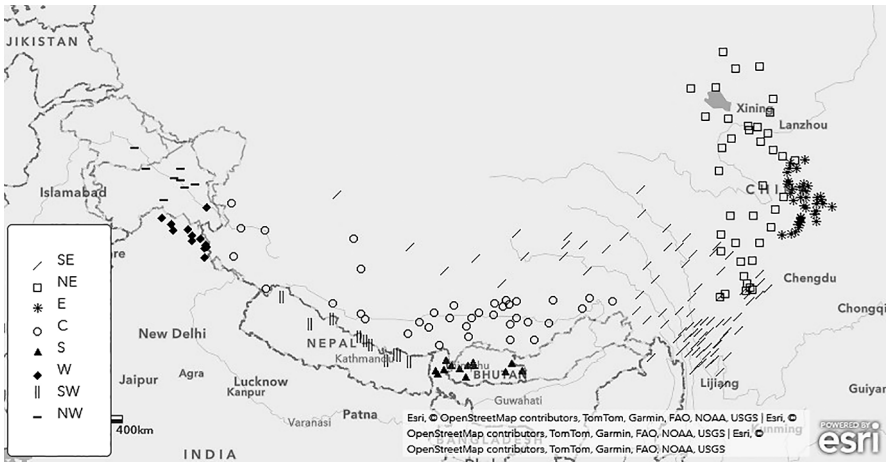

Figure 1 Geographical distribution of the Tibetic languages and their classification, based on Tournadre and Suzuki (2023). The legend is indicated by the abbreviation of each section.

Classification is based on a 'dialectal continuum' that considers various linguistic features that influence mutual intelligibility among native speakers. The continuum is not based on the strict criteria represented by shared innovations. Figure 1 provides an overview of the distribution of each section of the Tibetic languages. The article focuses specifically on the eastern Tibetosphere, where varieties belonging to the NE, E, and SE sections are spoken. Each section contains different dialect groups, which are considered to be independent languages (Tournadre and Suzuki 2023).

This article presents the sound correspondence patterns derived from Literary Tibetan (henceforth, LT) *r* connected to vowels in varieties spoken in the eastern Tibetosphere. The LT r-sounds can be classified into three categories: main initial, glide, and final. The LT *r* at a glide position is of particular interest, as it exhibits the most diverse patterns of sound correspondence in Tibetic languages.

In cross-linguistic terms, the 'r' sound, which encompasses the rhotic (Ladefoged 2006) and non-rhotic sounds inducing a phoneme /r/, is called rhotic or rhoticity (Jauriberry et al. 2012). It includes several sounds articulated from the dental to pharyngeal positions. Numerous studies have reported variations in the equivalents of the r-sound and its relevant sounds in modern Tibetic varieties. Examples include Jiang (2002), Suzuki (2009, 2011a), Zhang (2009), and Wang (2012). However, as the primary focus has been on individual phenomena, synthetic analyses of sound change processes have been scant.

This article examines the variation in sound correspondence associated with the phoneme /r/, exploring its phonetic and phonological development within the eastern Tibetosphere. The LT is considered to reflect the sound system during the creation of the Tibetan script. This provides a basis for discussions on the concrete

process of sound change from the r-sound as a consonant phoneme to sounds in modern varieties.

A detailed examination of rhoticity in Tibetic languages will facilitate an understanding of the sound shapes and changes observed in genetically related languages, such as Tibeto-Burman and even Sino-Tibetan. Several Qiangic languages, including rGyalrongic languages, exhibit *uvularisation* in their vocalic systems (Evans et al. 2016, Sims 2022). The term uvularisation is used to describe a phonological category that encompasses various phonetic realisations, including retroflexion, velarisation, uvularisation, and pharyngealisation. Additionally, it encompasses 'tense' or 'tense-throated' (*kinkoo* in Japanese; *jinhou* in Chinese) vowels (Evans 2006, Suzuki 2011b, Zheng 2023, *inter alia*). Furthermore, uvularisation is referenced in the reconstruction of the phonology in Tangut (Gong 2020), which is now analysed as a member of the West rGyalrongic languages, according to Lai et al. (2020) and Beaudouin (2023). In the reconstruction of the ancient Sinitic languages, arguments have been provided regarding the relationship among the r-sound, retroflexion, and pharyngealisation in the Grade II syllable (Яхонтов 1961, Baxter and Sagart 2014, Gong 2018). Nevertheless, as the aforementioned languages are not recorded using a phonogramme system, their phonetic reality and phonological position remain unclear.

The remainder of the article is organised as follows. Section 2 presents the syllable structures of Tibetic languages and a hypothetical structure for analysing rhoticity. Subsequently, Section 3 provides examples of the types of sound change patterns derived from r-sounds at a glide position. Section 4 discusses the sound changes between types, referring to those derived from the r-sounds at the initial and final positions. Finally, Section 5 concludes the study. All the linguistic data presented in this article are first-hand materials obtained through the author's fieldwork unless otherwise specified.

2. Syllable in the Tibetic languages and its framework

In the description of Sino-Tibetan languages, a definition of a syllable is considered an indispensable element (Zhu 2010: 302–336). Current research has examined this view in the Vietnamese context too (Yamaoka 2023). The description of Tibetic languages adheres to this approach, and Tournadre and Suzuki (2023: 223–233) provide a pandialectal syllable structure as phonotactics.

This section provides an overview of the syllable structures of Tibetic languages, which can be divided into two categories: (i) the historical system, as exemplified by the construction of the Tibetan script (Old Tibetan; henceforth, OT); (ii) a working hypothesis for modern pandialectal archi-structure.

The historical syllable structure, as demonstrated in OT and LT, is presented in (1).

(1) C-2 C-1 C C+1 C+2 V Cf1 Cf2

System (1) reflects Tibetan script. Proto-Tibetic forms, which predate the creation of scripts, may exhibit different patterns of syllable components, includ-

ing a metathesis of consonantal components. Zeisler (2023) examines the word family derived from the reconstructed root *smra(o) 'speak; speaker; human; lord', in which she relates /smr/ with /sm/, /rm/, and /dm/, for instance. However, the present discussion assumes that all the varieties under study in the eastern Tibetosphere are derived from OT, although evidence suggests dialectal variation in OT (Bialek 2018, forthcoming). Therefore, it does not refer to forms at the Proto-Tibetic level but principally employs LT forms. The OT and LT forms are transliterated in italics following the system of de Nebesky-Wojkowitz (1956).

Table 1 provides illustrative examples of the phonotactic allocation to system (1). As de Nebesky-Wojkowitz's (1956) transliteration system may represent a single phoneme using two Roman scripts, a slot may include two letters. For instance, *ng* in Cf1 of 'honey' corresponds to the phonetic symbol ŋ. The phonology represented in OT and LT follows the descriptions provided by sKal-bzang 'Gyur-med and sKal-bzang dByangs-can (2004: 379–390). In modern varieties, only the segmental feature is described, referring to the concept of 'pandialectal phonetic description' (Tournadre and Suzuki 2023), based on Zhu (2010) and Suzuki (2016a).

Table 1 Phonotactic allocation to the syllable components of LT forms.

Meaning	LT	C-2	C-1	C	C+1	C+2	V	Cf1	Cf2
hair	*skra*		*s*	*k*	*r*		*a*		
monastery	*grwa*			*g*	*r*	*w*	*a*		
sew	*bsgrags*	*b*	*s*	*g*	*r*		*a*	*g*	*s*
honey	*sbrang*		*s*	*b*	*r*		*a*	*ng*	

Although system (1) appears linear, it does not follow a straightforward linear order, as illustrated by the symbol *minus* in C-2 and C-1. A hierarchy of consonant clusters was observed in the initial position. In spoken varieties, this hierarchy functions as a fundamental system. According to previous research (Häsler 1999, sKal-bzang 'Gyur-med and sKal-bzang dByangs-can 2002, Shao 2018, *inter alia*), the phonological description of a Tibetic variety typically divides a syllable into two parts: initial and rhyme, as is the case in Sinitic languages.

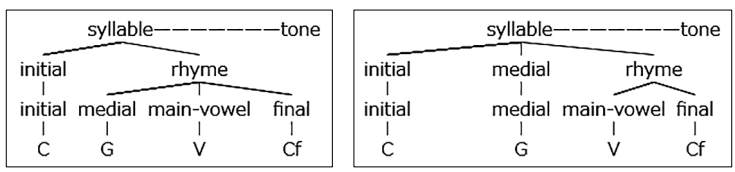

Figure 2a (left) Traditional initial-rhyme division model of Mandarin. Adapted from Zhu (2010: 304); Figure 2b (right) Initial-medial-rhyme division model of Beijing Mandarin. Adapted from Zhu (2010: 312).

However, the analysis of a syllable in Sinitic has been conducted using several approaches. Zhu (2010: 304–313) presents multiple analyses of the syllable structure of Mandarin, two of which are adapted in Figures 2a and 2b. At the bottom of Figure 2, the abbreviations employed for Tibetic languages are given for better contrast with Tibetic (C = C-2, C-1, C; G = C+1, C+2; Cf = Cf+1, Cf+2).

Figures 2a and 2b show that the medial side is positioned within the rhyme or in the middle. Nevertheless, Tibetic languages lack features corresponding to the medial aspects of Sinitic languages. Conversely, a feature similar to the Sinitic medial is glide (G), generally treated as part of the initial. An investigation of the underdocumented varieties revealed two distinct features within the glide—one associated with the initial and the other linked to the rhyme in a manner analogous to that of the Sinitic medial. To describe the syllable structure in a pandialectal manner, we propose a working hypothesis regarding the archi-system of syllable structures, as illustrated in Figure 3.

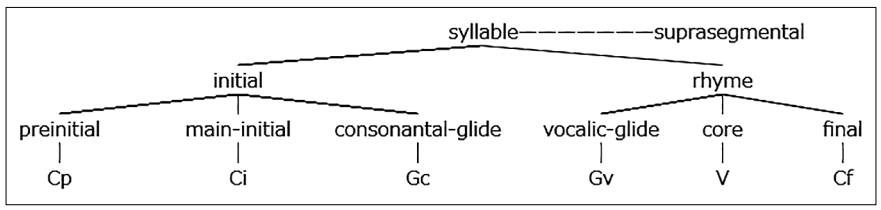

Figure 3 Initial-rhyme division model of Tibetic.

As in (1), Cp and Cf may include multiple segmental phonemes if necessary. Suzuki (2005) proposes that the relationship between Cp and Ci can be classified into three types: preinitial ^{Cp}Ci, tense cluster CpCi, and loose cluster Cp.Ci. However, Tournadre and Suzuki (2023) suggest that the preinitial type is essential. Here, the preinitial Cp may encompass both the phonemes associated with C-2 and C-1 illustrated in Table 1. Normally, Gv is occupied by a semi-vowel or vowel if diphthongs are recognised within the system. Table 2 provides examples of the phonotactic allocations shown in Figure 2.

3. Sound change patterns and their classification

This section lists sound correspondences attested to in Tibetic varieties spoken in the eastern Tibetosphere. The description is centred on *r* at the glide position of LT. Thus, the criterion is a historical sound, and the sound change patterns attested in the Tibetic varieties of the eastern Tibetosphere are arranged based on their influence on either the initial sound or the rhyme.

The sound correspondence patterns regarding *r* at the glide position of the LT are classified into the following four types:

A: retention of /r/

B: influence to the initial, triggering a retroflex initial

Table 2 Phonotactic allocation to the syllable components of spoken Tibetic forms.

Sec.	Variety	Meaning	Morpheme	Cp	Ci	Gc	Gv	V	Cf	cf. LT
SE	sProsnang	hair	ʰkrwə	ʰ	k	r	w	ə		*skra*
NE	Mroha	look	ɸ̥ˡta	ɸ̥ˡ	t			a		*blta*
SE	Phongpa	deprive	ᵐ̥pʰroʔ	ᵐ̥	pʰ	r		o	ʔ	*'phrog*
SE	dGudzong	pig	pʰjeʔ		pʰ		j	e	ʔ	*phag*
NW	Ladaks	iron	ˡ̥tɕaks	ˡ̥	tɕ			a	ks	*lcags*
NW	Purik	hair	ˢkra	ˢ	k	r		a		*skra*

N.B. The source for Ladaks and Purik are Tournadre and Suzuki (2023), and the remaining data are drawn from field notes.

C: influence to the initial, triggering a non-retroflex initial

D: influence to the rhyme, either triggering a rhoticised vowel or omitted

The following subsections present illustrative examples of each type accompanied by annotations. Sound correspondences with the LT Kr-, Pr-, and Tr-series are addressed. These series encompass all initial combinations containing complex initial combinations *kr*, *khr*, and *gr*, all initial combinations containing complex initial combinations *pr*, *phr*, and *br*, and *tr*, *dr*, and *'dr*, respectively.

Each type may contain exceptions that do not adhere to regular sound correspondence patterns. Therefore, it is necessary to conduct an independent analysis of exceptions from a synchronic description per variety. The following description employs the data obtained from the synchronic analysis of each variety.

3.1. Type A: Retention of /r/

Type A is observed in a few varieties, including Yodra, sProsnang, and Phongpa. Currently, these varieties are spoken in only three townships: Yuezha Township (Danba County, Sichuan), Zhonglu Township (Danba County, Sichuan), and Pengba Hamlet of Badi Township (Weixi County, Yunnan). All these varieties belong to Khams Tibetan (SE). The first two varieties belong to the same dialectal group and are designated as Rongbrag. The final variety belongs to the Sems-kyi-nyila group.

Table 3 Examples of the retention of /r/.

Meaning	hair	blood	monkey	dragon	write	six
LT	*skra*	*khrag*	*spre'u*	*'brug*	*bri*	*drug*
Yodra	ʰkrɔ	kʰrɑʔ	ʰpriː	ᵐbruː	prə	ʈuʔ
sProsnang	ʰkrwə	kʰrɑʔ	ʰpriː	ᵐbruʔ	prə	ʈʂuʔ
Phongpa	ʰkra	kʰrɑʔ	ʰprə	ᵐbrɔʔ	prə	ʈɔː

The phonetic features of the phoneme /r/ as a glide differ among varieties. Nevertheless, the sound of /r/ as a glide in each variety exhibits independent articulatory gestures and lengths, which necessitate their analysis as consonant clusters. This differs from the secondary articulation of the main initial, as highlighted by

Ding (2010), on Prinmi, a non-Tibetic Tibeto-Burman language spoken in and adjacent to the Tibetosphere. Notably, the Tr-series is pronounced as a retroflex obstruent, as in Type B.[1]

The existence of Type A indicates that the LT glide *r* is unquestionably pronounced. Although various historical records edited between the 16th and 18th centuries suggest that the LT glide *r* is approximately phonetically equivalent to the r-sound at the glide position in varieties provisionally corresponding to ancestors of the SE Section (e.g., Nishida 1963, Nishida and Sun 1990, Matsukawa and Miyake 2015, Suzuki 2015b), the pronunciation of the r-glide is evident in the current spoken varieties.

3.2. Type B: Influence to the initial, triggering a retroflex initial

Type B is a pervasive feature of Tibetic languages, even in cases where other types are present (Tables 3, 5, 6, and 7), demonstrating the Tr-series exhibiting sound correspondence. Table 4 indicates that Type B is present in all the LT series.

The pharyngealised vowel of the word for 'blood' in Sangdam is related either to the r-glide itself or to the suprasegmental reflexion of the Burmese creaky category, which can be realised as pharyngealisation (cf. Kato and Khin Pale 2010).

This type is documented in the widest area among Tibetic languages.[2] All the varieties in Table 4 belong to Khams Tibetan (SE).

3.3. Type C: Influence to the initial, triggering a non-retroflex initial

The author's dataset permits the classification of Type C into two subtypes: (C1) non-retroflex sounds corresponding to the Kr-series and (C2) non-retroflex sounds corresponding to the Kr- and Pr-series. These are described below.

(C1) Non-retroflex sounds corresponding to the Kr-series

Type C1 exhibits non-retroflex sounds corresponding to the Kr-series, in which several sounds are attested, such as denti-alveolar, prepalatal, and palatal obstruents. The commonality lies in the sound correspondence of the Pr- and Tr-series. Table 5 presents examples from sections NE (Mabzhi–Shingnyag) and E (dGonpa–Serpo).

[1] Type A has also been documented in many varieties belonging to the NW Section, including Balti (see Table 2, as well as Bielmeier 1985 and Zemp 2018). Other types are described in various sections. In Choča-ngača (S), the LT Pr-series exhibits Type A, whereas the LT Kr-series exhibits Type C (Tournadre and Karma Rigzin 2015). In Brokpa (S) and Kyirong (SW), the LT Pr-series exhibits Type A, whereas the LT Kr-series exhibits Type B (Pema Wangdi 2020 and Huber 2005, respectively). However, these types have not been observed in the eastern Tibetosphere.

[2] The type extends beyond the eastern Tibetosphere, as in Nangchen (SW) (Causemann 1989), Lhasa (C) (Hoshi 2003), Zhikatse (C) (Haller 2000), Sherpa (SW) (Tournadre et al. 2009), gLo-smad (SW) (Kretschmar 1995), Spiti (W) (Hein 2001), and Ladakse skat (NW) (Koshal 1979).

Table 4 Examples of the retroflex initials.

Meaning	hair	blood	monkey	dragon	write	six
LT	*skra*	*khrag*	*spre'u / sprel*	*'brug*	*bri / 'bris*	*drug*
Khrindu	ʰʈa	ʈʰɑʔ	ʰʈɯː	ⁿɖəʔ	ᵖʈə	ʈəʔ
Thopa	ʰʈa	ʈʰɑʔ	ᵖʈeː	ᵐɖowʔ	ʈə	ʈowʔ
dKandze	ʰʈʂa	ʈʂʰɔʔ	ʰʈʂiː	ⁿɖʐɯʔ	ʈʂə	ʈʉː
Sogpho	ʰʈo	ʈʰɑʔ	ʰʈi	ⁿɖɯɣ	ʈə	ʈuʔ
Lhagang	ʰʈa	ʈʰɑʔ	ʰʈuː	ⁿɖuʔ	ʈə	ʈuʔ
Nyayulzhabs	ʰʈʂa	ʈʂʰɑʔ	ʰʈʂʉː	ⁿɖʐuʔ	ʈʂə	ʈʂuʔ
Lithang	ʰʈa	ʈʰɑʔ	ʰʈi	ⁿɖuʔ	ʈə	ʈuʔ
nGramsna	ʰʈa	ʈʰɑʔ	ʰʈi	ⁿɖuʔ	ʈə	ʈuʔ
Zurdogshod	ʰʈa	ʈʰjaʔ	ʰʈʉː	ⁿɖuʔ	ʈə	ʈuʔ
Rwata	ʰʈɔː	ʈʰɑʔ	ʰʈʉː	ⁿɖɔʔ	ʈə	ʈʉʔ
Phula	ʰʈɔ	ʈʰɑʔ	ʰʈʉ	ⁿɖoʔ	ʈə	ʈoʔ
Zulung	ʰʈa	ʈʰɑʔ	ʰʈʉ	ⁿɖoʔ	ʈə	ʈoʔ
Tshawarong	ʰʈa	ʈʰaʔ	ʰʈʉː	ⁿɖʉʔ	ⁿɖe	ʈɯʔ
Sangdam	ʰʈa	ʈʰaˤʔ	ʰʈe	ⁿɖɔɯʔ	ʈə	ʈɔɯ

Table 5 Examples of the retroflex and non-retroflex initials, mainly in the Kr-series.

Meaning	hair	blood	monkey	dragon	write	six
LT	*skra*	*khrag*	*spre'u*	*'brug*	*bri / 'bri*	*drug*
Mabzhi	ˢca	cʰəq	ᵖʈi	ᵐɖək	ᵐɖə	ʈək
Rebgong	ˢtɕa	tɕʰəχ	ᵖʈi	ⁿɖək	ⁿɖə	ʈəx
Shingnyag	ˢtɕa	cʰəq	ᵖʈwə	ᵐɖək	ᵖʈə	ʈək
Bragkhoglung	ʰɕa	tɕʰɑ	r̥iː	ⁿɖuɯ	ⁿɖə	ʈɔɯ
dGonpa	ʰsə	tsʰɑ	ʰʈu	ⁿɖuᵚ	ⁿɖə	ʈuᵚ
'Azha	ʰɕɜ	tsʰɑ	ʰʈi	ⁿɖʉ	ⁿɖə	ʈʉ
gYiwa	ʰsa	tsʰɑ	ʰɕiː	ⁿɖʉ	ʈə	ʈʉː
Askyirong	ɕʰa	ʈʰɑɬ	ʰpiː	ⁿɖuɬ	ⁿɖə	ɖuɬ
Phyugtsi	sa	tsʰɐ	ʂiː	ⁿɖʉː	ʈə	ʈu
sKyangtshang	ʰʂa	tɕʰɑɬ	ʰʂiː	ⁿɖuɬ	ⁿɖə	ʈuʔ
Serpo	ˢtɕa	tɕʰɑɬ	ʰpiː	ⁿɖɯɬ	ⁿɖə	ʈuɬ

Notably, exceptions of the sound correspondence in the word for 'monkey' are attested in Askyirong and Serpo. These exceptions do not exhibit a regular phonological correspondence; instead, /ʰʂa/ and /ʰʂiː/ for LT *sprin* 'cloud', respectively, exhibit a regularity (LT *spr* :: /ʰʂ/[3]). sKyangtshang /ʰʂa/ :: LT *skra* 'hair' appears

[3] Two colons indicate that the left side corresponds to the right side, and each side includes a LT form and/or a phonological description.

to be an exception; however, this follows the regularity: LT *spr* and *skr* :: /ʰʂ/. Consequently, Type C1, regarding sKyangtshang, displays a restricted vocabulary, with the Kr-series corresponding to a non-retroflex sound.

(C2) Non-retroflex sounds corresponding to the Kr- and Pr-series (Tr-series may also be included)

Type C2 suggests a non-retroflex feature in the LT r-glide series, with the exception of the Tr-series. However, varieties with a Tr-series corresponding to non-retroflex sounds have been attested. The former is spoken in the southernmost region of the eastern Tibetosphere (SE; Sems-ky-nyila group in principle), while the latter is spoken in the north-eastern region (E; some varieties of the Thewo-smad group). Table 6 presents examples from sections E (Khaba and Byambab) and SE (Choswateng–Myigzur).

Khaba and Byambab from Thewo-smad are typologically classified as varieties that lack retroflex obstruents in their consonantism (but possess the phoneme /ɾ/). Nonetheless, the sound features corresponding to LT *r*-glide were not omitted. Otherwise, the initial of the word for 'six' should have maintained the denti-alveolar series /t/. Conversely, the feature derived from the LT *r*-glide influenced the initial consonant, resulting in a change to /tɕ/. Section 4 discusses this process in more detail.

Table 6 Examples of the retroflex and non-retroflex initials, mainly in the Kr- and Pr-series.

Meaning	hair	blood	monkey	dragon	write	six
LT	*skra*	*khrag*	*spre'u*	*'brug*	*bri / 'bri*	*drug*
Khaba	ʰɕa	tsʰaː	ʰɕiː	ⁿdʑʊ̣	ⁿdʑə	tɕʊ̣ː
Byambab	ʰɕa	tsʰɑʔ	ʰɕeː	ᶯdʑʉʔ	tɕə	tɕʊ̣
Choswateng	ʰca	cʰɑʔ	ʰçʉː	ᶯɟɔʔ	çə	ʈɔʔ
Alangu	ʰca	cʰɑʔ	ʰɕʉː	ᶯɟɔʔ	ɕə	ʈɔʔ
rGyalthang	ʰtɕa	tɕʰɑʔ	ʰɕʉː	ⁿdʑɔʔ	ɕə	ʈɔʔ
Khrezhag	ʰca	cʰɑʔ	xʉː	ᶯɟɔʔ	çə	ʈɔʔ
gYaglam	ʰtɕa	tɕʰɑʔ	ʰçʉː	ɲɔʔ	çə	ʈɔʔ
Byagzhol	ʰtɕa	tɕʰɑʔ	ʰɕʉː	ⁿdʑɔʔ	ɕə	ʈɔʔ
Lamdo	ʰca	cʰɑʔ	ɕʉ	ⁿɖɔʔ	ɕə	ʈwɔʔ
dNgo	ʰca	cʰɑʔ	ʰçʉː	ᶯɟɔʔ	çə	ʈɔʔ
Phuri	ʰtɕa	tɕʰɑʔ	ɕʉː	ᶯɟɔʔ	ɕə	ʈɔʔ
mBalhag	ʰca	cʰaˀʔ	ʰɕʉː	ᶯɟɔʔ	ɕə	ʈɔʔ
Myigzur	ʰca	cʰaʔ	ʰxuː	ᶯgoʔ	çə	ʈoʔ

The remaining varieties in Table 6 are from the Tibetosphere of Yunnan. All, except mBalhag, belong to the Sems-ky-nyila group. mBalhag, affiliated with the sDerong-nJol group, is spoken in an area adjacent to that of the Sems-ky-nyila group. These varieties exhibit sound correspondences of the Kr- and Pr-series with the prepalatal and palatal series. The palatal nasal in the word 'dragon' in gYaglam

exhibits progressive assimilation of prenasalisation that characterises the variety (Suzuki 2016b).

Notably, the velar obstruents appear in the words 'monkey' in Khrezhag and Myigzur and 'dragon' in Myigzur—an outstanding feature of several rGyalthangic languages (Suzuki 2012; see Suzuki 2024a for the term 'rGyalthangic'). Furthermore, Myigzur exhibits additional sound correspondence patterns, including /ke/ :: LT *gri* 'knife' and /^{h}çī/ :: LT *sprin* 'cloud'. In particular, the former example indicates the absence of LT *r*-glide. This phenomenon is referred to as dorsalisation by Suzuki (2024b) and is related to Type D.[4]

3.4. Type D: Influence to the rhyme, either triggering a rhoticised vowel or omitted

Type D is found in a limited subgroup—the Melung subgroup of the Sems-kyi-nyila group (SE). In this type, LT *r*-glide affects the rhyme part without affecting the initial part.

Table 7 Examples of the rhyme, either triggering a rhoticised vowel or omitted.

Meaning	hair	blood	knife	cloud	forehead	monkey	dragon	write	six
LT	*skra*	*khrag*	*gri*	*sprin*	*dpral*	*sprel*	*'brug*	*bri*	*drug*
mThachu	^{h}kaˤ	k^{h}aˤʔ	kwəˠ	pəˠ	^{h}paˤ	^{h}puˠː	^{m}bəˠʔ	pəˠ	ʈɔʔ
nKhorlo	^{h}ka	k^{h}aʔ	kəˠ	pəˠ	^{h}paː	^{h}puˠː	^{m}bəˠʔ	pəˠ	ʈɔʔ
sKobsteng	^{h}kaˤ	k^{h}aˤʔ	kəˠ	pəˠ	^{h}paˤː	^{h}puˠː	^{m}bəˠʔ	pəˠ	ʈɔʔ
Melung	^{h}ka	k^{h}aʔ	kəˠ	pəˠ	^{h}paː	puː	məˠʔ	pəˠ	ʈɔʔ
Zhollam	^{h}kaˤ	k^{h}aˤː	kɜˤː	pəˤ	^{h}paˤʔ	^{h}pʏː	^{m}bɔ ɣɔ	pəˠː	ʈɔwʔ / tɔwʔ
Daan	^{h}ka	k^{h}aː	gə	-	-	xõ	^{ŋ}gwə	xɯː	tɯː

Among the varieties presented in Table 7, Daan exhibits a slightly different sound change in the words for 'monkey', 'dragon', and 'write'; for further details, refer to Suzuki (2024b). Furthermore, it has been observed that the rhoticised feature is subject to loss in both nKhorlo and Melung, contingent on the specific vowel quality: /a/ in nKhorlo and /a, u/ in Melung.

The absence of the r-sound has also been verified in various dialects, including sGawa (Yulshul, SE) and Lhasa (C), in several words belonging only to the Pr-type (for further details, refer to Konchok Gelek 2017 and Yu 1983, respectively). Although the current phonological form is similar to that observed for each variety, the process of historical sound changes likely differs from that of Type D.

4. Discussions

This section examines the relationships and sound changes among the differ-

[4] Additionally, varieties exhibiting a type similar to Sems-nyi-kyila are found in the S Section, as in Dzongkha (van Driem 1998) and Dränjong (Yliniemi 2019).

ent types. The classifications and examples provided in Section 3 are synchronic descriptions, although they are based on a historical perspective to contrast with LT forms. Regarding the LT *r*-glide, Type A is considered to exhibit the most archaic status. This developed into two processes: (1) affecting the initial part (Types B and C) and (2) affecting the rhyme part (Type D). In previous studies of Tibetic phonological history, such as those by Jiang (2002), Zhang (2009), and Wang (2012), the process of Type A > Type B + C has been the primary focus. Nevertheless, only a few studies have discussed Type D (e.g., Suzuki 2011c), and the development from LT to Type D has not received significant attention despite its phonetic variation and phonological complexity. Consequently, this discussion concentrates on the position of Type D in the relevant sound changes.

This section comprises four subsections. First, with reference to previous studies, we present two hypotheses to interpret the establishment of Type D, arriving at a more plausible hypothesis. Second, we examine this hypothesis. Third, we determine the relative chronological order of the series of sound changes based on the examinations. Finally, we present typological remarks and geolinguistic considerations.

4.1. Hypotheses

As outlined in Section 2, the LT r-glide can be posited in the initial part. Consequently, the direction of sound change in Tibetic languages is oriented towards the initial part (Type A > Types B + C). Subsequently, we examine the factors that may have contributed to the emergence of Type D. Two hypotheses can be proposed in this regard based on relevant research results. First, r-glides undergo metathesis or floating, as demonstrated by Zhang et al. (2023). Second, *rhoticisation*—/r/ becomes rhoticised, acquiring an abstract feature of rhoticity and replacing its segmental status.

4.1.1. Hypothesis 1: Metathesis or floating

Metathesis is the transposition of two phonemes within a given lexical form. In the present context, the LT *r*-glide may undergo a similar alternation, as illustrated in (2). Table 7 supports the hypothesis that (2) is indeed the correct interpretation; (2a) and (2b) correspond to /$^{\text{h}}$ka$^{\text{ʂ}}$/ (:: LT *skra* 'hair') and /k$^{\text{h}}$a$^{\text{ʂ}}$ʔ/ (:: LT *khrag* 'blood') in mThachu, respectively, whereas (2c) would have been realised by */k$^{\text{h}}$aʔr/ or */k$^{\text{h}}$aʔ$^{\text{ʂ}}$/.

(2) a CrV > CVr > CV
b CrVC > CVrC > CVC
*c CrVC > CVCr ('r' denotes either /r/ or any rhotic sound)

This phonological change has been observed in several Tibeto-Burman languages. Wang et al. (2023) describes the Puroik (Sulong) language as spoken in the south-eastern region of Tibet. They observe that the original glide /r/ underwent a process of floating from the glide to the rhyme part, which was conducted over successive generations.

The term *floating* argued by Wang et al. (2023), suggests that the r-sound should be able to move freely around the glide position. However, the r-sound given in Tibetic languages exhibits only a monodirectional change, as illustrated in (2a) and (2b). Other instances of the r-sound, which appear as either preinitial, main initial, or final, do not trigger the phenomenon of floating in the languages under consideration. Notably, similar observations have been made regarding the main initial /r/ in other Tibeto-Burman languages. For further details, see 4.4.

Formulation (2) suggests that /r/ undergoes metathesis with a vowel positioned adjacent to /r/. This understanding raises an essential problem: only the *r*-glide undergoes this metathesis. Moreover, the glide position may be occupied by the LT *y*- and *l*-glides. Consequently, metathesis cannot be applied to every glide but the *r*-glide. Furthermore, it is necessary to consider the impact of the r-sound following the metathesis on the preceding vowel in comparison with the original *r*-final.

4.1.2. Hypothesis 2: Rhoticisation

Rhoticisation is distinguished from *rhotacisation* that denotes a change from a non-r-sound to a r-sound at the consonant level. Contrary to the use of the term by Ding (2010), Müller (2011), and Vergis and Terkourafi (2012), *rhoticisation* is defined here as a phenomenon whereby a consonant phoneme /r/ obtains any sounds with a rhotic status, as indicated by the falling of the third formant (F3), as suggested by Ladefoged (2006). This interpretation is nearly consistent with that of Jauriberry et al. (2012). Rhotic features may include secondary articulations, such as retroflexisation, velarisation, uvularisation, and pharyngealisation. The process of rhoticisation may occur at either a glide or final position—at a position next to a vowel. The rhoticised feature, represented by ^{R} in (3), is a non-segmental phoneme; it does not occupy independent articulation time but is realised as a secondary articulation, and it is not a standalone phonological element. It is, therefore, merely a distinctive feature [±rhotic]. Consequently, it can move over a rhyme when the r-glide is rhoticised.

(3) a CrV > *C^{R}V > CV^{R} > CV (an asterisk represents "not verified")
b Cr{VC} > *C^{R}{VC} > C{VC}^{R} > C{VC}
(brackets { } represent a rhyme part)

Formulation (3) delineates a process whereby a r-glide, which functions as a consonant phoneme, is transformed into a rhotic feature, ultimately manifesting in the rhyme. Rhoticisation is derived from the r-sound itself; thus, other sounds are irrelevant. The r-sound as the main initial follows (3) in a manner similar to glide, whereas the r-sound as a final does not affect it. Furthermore, as the sound change is spontaneous and monodirectional (r > ^{R}), which bears resemblance to the spreading of a distinctive feature ([±rhotic] in the present case) in autosegmental phonology; (3) is non-reversible and not a phenomenon called floating.

The articulatory features that trigger F3's significant falling include the following, all of which are related to the r-sound in Tibetic: pharyngealisation (as in

Suzuki 2011a, b, 2013), velarisation (Suzuki 2010, 2013), and retroflex (Suzuki and Tshering mTshomo 2009, Suzuki 2013, 2019). If F3's falling is an essential distinct feature, rhoticisation will function phonologically.

4.2. Examination

Hypothesis 2 is a more probable explanation for Type D.[5] To examine this, we argue the cases of LT *r* positioned adjacent to a vowel as the main initial and final.

4.2.1. Main initial *r*

The primary issue concerns the initial r-sound occurring independently within the initial part, which does not always align with the etymologically main initial *r* in LT (*r* at the glide position in LT *bri* 'write' originally functions as a main initial; cf. Hill 2005). If rhoticisation occurs, the initial *r* connected to a vowel may also influence the rhyme.

The initial r-sounds in Tibetic languages are typically described as /r/, although they are rarely pronounced as trills [r] even in the system of the pandialectal phonetic description (Tournadre and Suzuki 2023) because of the existence of phonetic variations in the articulatory manner of /r/. The most common patterns are as follows:

(a) /r/ principally includes a denti-alveolar trill [r], an alveolar approximant [ɹ], and a retroflex approximant [ɻ].
(b) /r/ principally includes an alveolar approximant [ɹ] and an alveolar flap [ɾ].
(c) /r/ principally includes an alveolar approximant [ɹ], an alveolar flap [ɾ], and a retroflex fricative [ʐ].

Type (a) is characterised by the use of a trill and is thus found in the varieties in which /r/ and /ʐ/ are distinctive. In the eastern Tibetosphere, this variety is found in the Rongbrag, Sems-kyi-nyila, sDerong-nJol, and Chaphreng groups, as well as Baima, as described by Wei (2019: 17–19). Types (b) and (c) are present in varieties where /r/ and /ʐ/ are not distinctive. The choice of real sound is contingent upon a multitude of factors, including the individual speaker and the specific mode of discourse, even within a given regional variety. In the case of Type (c), previous works, such as Sun (2019), have selected the symbol ʐ to represent a phoneme of the r-sounds in the present study.

Notably, these phonetic realisations are not always associated with rhotic features. As rhoticisation is associated with the F3's falling, the key phonetic realisations should include [r], [ɹ], and [ɻ] among the aforementioned sounds as an initial. Consequently, Type (a) is the most appropriate for discussing rhoticisation. The question here concerns the varieties with Type D, all of which possess /r/, showing Type (a), and /ʐ/ as phonemes.

As Table 8 illustrates, rhoticisation has already manifested to varying degrees

[5] Hypothesis 1 is effective in a restricted number of instances, with the exception of Type D. See the last paragraphs of 4.2.1.

across different varieties, with Type D representing a notable instance. Yodra, with Type A, is included in the varieties in which rhoticisation of the initial *r* has occurred. Table 8 presents a morpheme that includes the main initial, omitting the other syllables, the position of which is indicated with the symbol (+), in each lexical form.

Table 8 Rhoticisation of the main initial *r*.

Meaning	mountain	cloth	bone	friend	goat	horn
LT	*ri*	*ras*	*rus*	*rogs*	*ra*	*rwa*
mThachu	wɚ	ɦɛː	wɚː (+)	wo˞ (+)	ɦʸɐ	wa˞ː
nKhorlo	ɦɚ	ɦɛː	ɦʷɚː (+)	ɦoˠ (+)	ɦʸɐ	waː
sKobsteng	ɦɚ	-	ɦɚ (+)	ɦuʔ (+)	ɣaˠ	-
Melung	ɚ	ɦɛː	ɚr (+)	roʔ	ra	-
Zhollam	ɦɜˤː	ɦɛˤː	ɦaˤj (+)	ɦoˤː (+)	ɦaˤː	wāˤ
Daan	ɚ	ɦɛː	ɚr (+)	roʔ	ra	-
Yodra	ɦɚ	wrɛ˞ː	ɦɚ (+)	ɦwɚː	wrɔ	-

One of the most common features of these varieties is the emergence of a voiced glottal fricative /ɦ/, which replaces the main initial *r*. This is analysed as a consonant phoneme. Furthermore, /ɦ/ may be labiovelarised (ɦʷ) or velarised (ɦʸ). In other instances, a voiced labiovelar approximant, /w/, emerges. Consequently, the r-sound leaves an imprint at its original initial position in numerous instances. The remaining /r/ as a main initial is commonly pronounced as a trill [r] or an approximant [ɹ].

Rhoticised features in the rhyme part include retroflex (V˞ or Vr), velarised (Vˠ), and pharyngealised (Vˤ). A synchronic analysis of each variety reveals that the retroflex rhyme is present in all varieties under study, although the principal rhoticised feature is different (e.g., pharyngealisation in Zhollam; Suzuki 2011c). The two forms of the word 'bone' in Melung and Daan are distinguished by the presence of the final consonant /r/. Thus, the original glide /r/ shifts to the final position. However, this analysis does not accurately reflect the underlying linguistic reality. The observed phenomenon can be attributed to the existence of an additional syllable following the syllables listed in Table 8.

Notably, in Yodra's case, the phonetic value and phonological status of /r/ are expected to be maintained even as the main initial in the case of Type A for the r-glide. Nevertheless, Table 8 does not show these results. Instead, as in the case of varieties exhibiting Type D, the main initial *r* does not always appear as /r/. It can be posited that the r-sound in the initial position is located at the *glide* position (/wr/ in 'cloth' and 'goat'), applying a strict analysis of syllable structure. If this interpretation is correct, Yodra exhibits a pattern whereby the r-sound is absent when it functions as the main initial but remains in an initial consonant cluster combined with its *newly emerged* main initial. Conversely, an alternative hypothesis may be required regarding the sound correspondence between LT *r* and /wr/. Nonetheless, this issue is not addressed in the present discussion. In conclusion,

Table 9 presents a phonotactic analysis of each phoneme within a syllable (Table 1) based on the examples in Tables 3 and 8.

Table 9 Phonotactic analysis of every phoneme in Yodra.

			Initial			Rhyme		
Meaning	LT	Lexical form	Cp	Ci	Gc	Gv	V	Cf
mountain	*ri*	ɦə̣		ɦ			ə̣	
friend	*rogs*	ɦwə̣ː		ɦ		w	ə̣ː	
cloth	*ras*	wrɛ̣ː		w	r		ɛ̣ː	
goat	*ra*	wrɔ		w	r		ɔ	
blood	*khrag*	kʰrɑʔ		kʰ	r		ɑ	ʔ
hair	*skra*	ʰkrɔ	ʰ	k	r		ɔ	
dragon	*'brug*	ᵐbruː	ᵐ	b	r		uː	
six	*drug*	ʈuʔ		ʈ			u	ʔ

The cluster /ɦw/ in the word 'friend' differs from /wr/ in the words 'cloth' and 'goat' in its phonotactics. The description here interprets that the /w/ of /ɦw/ is derived from the rhyme sound correspondence with the LT rhyme *ogs*, which was influenced by rhoticisation. Conversely, /r/ of /wr/ is a glide parallel to the original *r*-glide and /w/ is generated.[6] This may also influence the rhyme, as in the retroflex vowel in 'cloth'. The preceding analysis indicates that Yodra exhibits a reasonable structure comprising three consecutive sound correspondences.

- Influence of the /r/-glide to the initial part > retroflex of the initial as in 'six', and the /r/-glide maintained as in 'blood', 'hair', and 'dragon';
- Rhoticisation of the main initial *r*: as in 'mountain' and 'friend'; and
- Main initial r divided into /wr/, and /r/ posited and maintained at the glide position: as in 'cloth' and 'goat'.

Currently, the processes described above have only been attested in Yodra. However, the second feature suggests a significant change in varieties exhibiting Type D.

Finally, a phenomenon analogous to floating with respect to r-initial is presented. Suzuki (2015a: 246) presents phonetic variants of the r-sound in the dGonpa variety of mBrugchu, as exemplified in (4).

(4) ʰtə ʰtə ʰtə-rə (phonological description)
[ʰtə ɹə], [ʰtə ə̣], [ʰtə̣] (possible surface forms)
now horse look-PRS[7]
'I am now looking at the horse.'

[6] This is analogous to the English pronunciation of *r* as an initial consonant, in which the majority of British dialects demonstrate labialisation: [ɹʷ] (see Ladefoged 2000). Detailed descriptive and acoustic investigations are indispensable in the case of the Yodra dialect as well.

[7] Gloss: PRS = present.

The phonetic variation observed in (4) is primarily attributable to the morpheme /rə/, which functions as a suffix. This variation is not reflected in any stem of the lexical words. Consequently, the phenomenon in question emerges within the speech flow and differs from the r-sounds and rhoticisation discussed in this article. See 4.4 for similar cases in other Tibeto-Burman languages.

4.2.2. Final *r*

The preceding description clarifies the conditions under which the r-sound is connected to a vowel. Another candidate for examination is *r*-final, which may be connected to a preceding vowel. The varieties discussed in Table 8, which include those with Type D and Yodra, demonstrate a pervasive sound correspondence in Tibetic languages. These varieties result in a vocalic change in quality and/or length, which is achieved through the omission of the /r/'s consonant status. The results are presented in Table 10. The following correspondences can be observed: LT er :: /eː, ɛː, ɛj, iː, e/, and LT ar :: /ɛː, ɛ, e, ɯː, aː, ɛ̃/.

Table 10 Sound correspondence of the LT *r*-final in Melung varieties and Yodra.

Meaning	gold	white	red
LT	*gser*	*dkar*	*dmar*
mThachu	ʰseː	ʰkɛː (+)	me (+)
nKhorlo	ʰsʰɛː	ʰkɛː (+)	me (+)
sKobsteng	ʰseː	ʰkɛ (+)	mɛ (+)
Melung	ʰsʰɛː	ʰkɛ (+)	mɛ̃ (+)
Zhollam	ʰsɛj	ʰke (+)	ʱme (+)
Daan	ʰɕiː	ʰkɯː	ʱmaː
Yodra	ʰse	ʰkaː (+)	ʱmaː (+)

Table 10 illustrates two key points: (i) the LT *r* does not maintain its consonantal status and even a rhotic counterpart; (ii) a /r/-glide or any rhotic features do not emerge. The aforementioned examples indicate that the r-final can induce vocalic change without any trace of the final consonant, /r/, in a floating state.

Nevertheless, r-final can also result in the production of rhotic vowels depending on the specific variety in question. Two independent phenomena require attention: (i) the connection between the *r*-final and retroflex vowels attested in rGyalthangic (Table 11; see Suzuki 2019); (ii) the connection between *r*-final, velarised, and retroflex vowels (Table 12; see Suzuki 2011d).

Table 11 demonstrates that the synchronic variation observed in LT *r*-final reflects a diachronic process from a geolinguistic perspective (Suzuki 2022). The order from gYaglam to Choswateng is consistent with the progression from west to east. The variation corresponding to r-final exhibits a gradational change. The forms of gYaglam and Khrezhag are the closest to LT, indicating the maintenance of the most archaic form. In contrast, gNamlha uniformly shows a retroflex vowel. Thangstod, based on the system of gNamlha, exhibits a commonality with Byagkar and Choswateng, in which the vocalic quality is similar. All varieties in Table 11

exhibit rhoticity in the words for 'gold' and 'wet' as either a rhotic consonant /r/ or /ɻ/, a retroflex vowel, or a pharyngealised vowel at the phonetic level (Suzuki 2014).

Table 11 Sound correspondence of the LT *r*-final in rGyalthangic.

Meaning	butter	gold	wet	white
LT	*mar*	*gser*	*gsher*	*dkar*
gYaglam	mər	ʰsər	ʂər	ʰkər
Khrezhag	məɻ	ʰɕəɻ	ʂəɻ	ʰkəɻ
gNamlha	mə˞	ʰsə˞	ʂə˞	ʰkə˞
Thangstod	mõː	ʰɕə˞	ʂə˞	ʰkɯː
Byagkar	moː	ʰsɿː [ʰsɿˤː]	ʂl̩ [ʂl̩ˤ]	ʰkɯː
Choswateng	muː	ʰsɿː [ʰsɿˤː]	ʂl̩ [ʂl̩ˤ]	ʰkɯː

Table 12 Sound correspondence of the LT *r*-final in nJol and sGogrags groups.

Meaning		butter	new	white
LT		*mar*	*gsar*	*dkar*
sNyingthong	age above 60	məˠ	ʰsəˠː	ʰkəˠ
	age 40–60	maː	ʰsaː	ʰkaj
	age below 40	maː	ʰsaː	ʰkaː
Yarkha	age above 60	mar	ʰsər	ʰkər
	age 40–60	maˠː	ʰsaˠː	ʰkaˠ
	age below 40	maː	ʰsaː	ʰkaː
Tsharethong		mjeː	ʰsa˞	ʰka˞

Table 12 presents the velarised and retroflex vowels corresponding to the LT rhyme *ar*. This velarised feature is no longer evident in the pronunciation of speakers of sNyingthong and Yarkha in the younger generation. Conversely, the retroflex feature in Tsharethong persists in all generations' speech and even with other LT vowels (e.g., LT *skyur* 'sour' :: /ʰtɕʉ˞ː/ and LT *gser* 'gold' :: /ʰsɛ˞ː/).

Tables 11 and 12 illustrate that *r*-final does not undergo /r/-glide despite the potential for a vocalic change resulting from the omission of the final consonant /r/.

4.3. Relative chronological order of the sound change

In light of the observations and discussions presented in 4.2, it can be posited that the direction of sound change regarding the r-glide has been delineated with greater precision. The hypothesis that floating does not occur in most Tibetic languages spoken in the eastern Tibetosphere was proposed. Instead, the sound change is posited to be monodirectional with a relative chronological order.

The r-sound connected to a vowel may undergo a change within either the initial or the rhyme part, as illustrated in Figure 4. The initial and rhyme processes are

independent of each other.

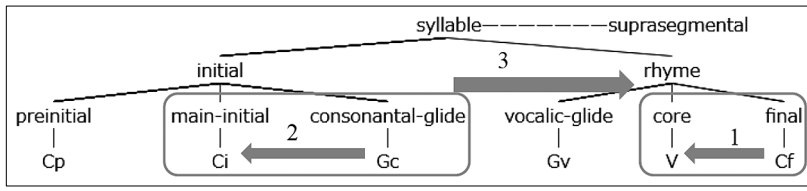

Figure 4 Summary of the sound change of the r-sounds.

The rhyme part is simple, and a single route of sound change (R1 > R2 > R3; or R1 > R3; Arrow 1 in Figure 4) is attested as follows:

R1: the r-final maintains as it is

R2: the r-final is rhoticised with retroflex or velarisation

R3: the r-final is lost by influencing a preceding vowel without rhotic features

Referring to Yodra's case, we shape the order of sound changes in the initial part. First, the r-glide operates on its main initial, as in I1a and I1b (Arrow 2 in Figure 4), followed by I2a (Arrow 3 in Figure 4; Type D) and I2b (Type C2 in Sems-kyi-nyila Tibetan). I1 and I2 undergo independent processes.

I1a: when the combination is a Tr-series, the r-sound triggers a change in the articulatory position of the initial and the combination fuses into a retroflex obstruent

I1b: when the combination is Kr- and Pr-series, the r-glide maintains as it is

I2a: the r-sound in the initial part obtains rhotic features due to the following vowel (rhyme part)

I2b: the r-sound in the initial part is dorsalised and realised as /j/, remaining at the glide position, which triggers a change with the main initial

The outcome of I2a depends on the type of questions. Yodra demonstrates that a single r-initial may change to a voiced glottal fricative. This occurs in several lexical forms that produce a cluster /wr/ (< /r/) to maintain the consonant status as a /r/-glide. Conversely, the varieties with Type D exhibit rhoticisation in all r-sounds connected to the vowel. In Zhollam, the LT *dr* also corresponds to /t/, as in LT *drug* :: /ʈɔwʔ, tɔw/ (Table 7). However, the denti-alveolar initial is produced due to the loss of the retroflex plosive from the consonantism, as it may violate the chronological order of I1a and I2a.

The relative chronological order demonstrated above provides further support for the previous approach to the phonological history of Tibetic languages, which takes a bipartite division of initial and rhyme, except for Type D, which is influenced by the LT glide *r* in the rhyme part. As elucidated by Suzuki (2011c), the rhyme part in a variety with Type D must be analysed in accordance with the presence or absence of glide *r* in the initial part.

4.4. Typological remarks and geolinguistic perspectives

The preceding discussions are premised on the assumption that the r-sound in Tibetic languages is a coronal sound exhibiting a rhotic feature. This is supported by the data for the main initial *r* described earlier. However, Types C and D demonstrate a sound change into a dorsal feature, as evidenced by the emergence of palatal and velar consonants and velarisation. This sound correspondence tendency is already well known in European languages. The grapheme *r* can be pronounced as either coronals [r] and [ɹ], velars [x] and [ɣ], or uvulars [ʁ] and [ʀ]; see Chambers and Trudgill (1998: 171) for their distribution. From a typological perspective, it is possible to consider whether the change in the r-sound is due to either a substantial articulatory change or an acoustic commonality concerning F3 falling.

The process of dorsalisation of the single /r/ as an independent consonant has not been attested to in Tibetic languages. Nevertheless, other Tibeto-Burman languages, such as Naic and Burmic languages, exhibit sound correspondences between Proto-Tibeto-Burman *r and dorsal consonants, including [ɣ, j, ʝ, ʑ], in addition to the coronal rhotic counterpart (Li 2018; Nishi 1998).

As previously stated, *r in ancient Tibetic languages is hypothesised to represent a coronal sound. Hence, languages with Type D trigger a sound change of *r from coronal to dorsal and then to pharyngeal. However, this process has not yet been verified to be synchronic. With regard to the floating phenomenon represented by interchangeability between /rə/ and /ə̀/, as illustrated in (4), it is postulated that this did not occur in ancient Tibetic languages. Similar phenomena have been reported in Tibeto-Burman languages of the eastern Tibetosphere, such as Lyuzu (Huang and Rig-'dzin dBang-mo 1991a: 137) and Shuhing (Huang and Rig-'dzin dBang-mo 1991b: 178). However, the phonological analysis of Lyuzu reveals that it occurs in the rhyme part, /əɹ/ [əɹ, ʐə̯] (1991a: 137). The counterpart of Shuhing exhibits a phenomenon similar to Example (4) of dGonpa; in a weakened position, /rə/ has a free variant, [əɹ], as displayed in the example /ɕæ^{55}ə̯ ^{33}/ 'bone' pronounced in [ɕær^{53}] and [ɕæ^{55}əɹ^{33}] (1991b: 178). Consequently, these observations do not affect the hypothesis regarding the phonetic features of *r.

Concerning the geographical distribution of the r-glide sound change type, it becomes evident that Type D is concentrated in the south-eastern corner of the Tibetosphere, where the Tibetic languages are in contact with Naxi. Suzuki (2011a, 2013) argues for the possibility of intensive contact; therefore, the question is how the two languages interact with each other in the r-sound. Similarly, in Naxi, Tibetic varieties with Type D exhibit a variety of phonetic realisations for rhotic features, including retroflex, velarised, and pharyngealised vowels. This case suggests that the rhotic feature should be interpreted as an abstract phonological feature, namely rhoticisation, regardless of the variegated phonetic realisations.

A macroscopic view of geographical distribution is also of interest (Figure 5). Tibetic languages exhibiting Type D are distributed in a zone in which sounds derived from *r have non-/r/ rhotic qualities. The aforementioned languages, including Naic (Naxi), and Bai (Wang 2008 for its dialect data), as well as the

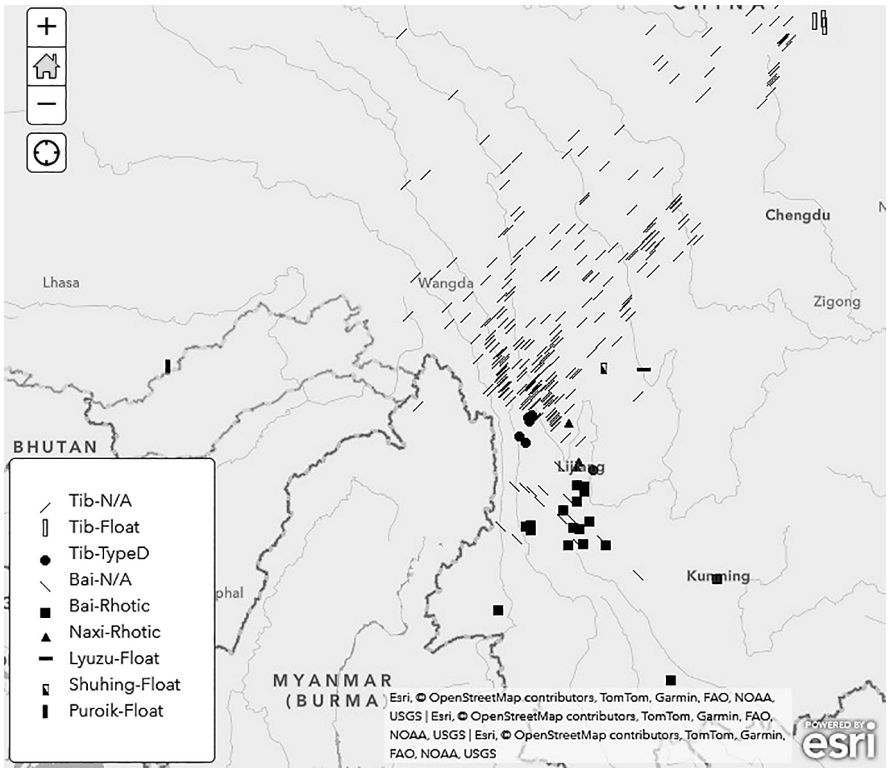

Figure 5 Distribution of Tibetic Type D and floating type with those in non-Tibetic languages (limited dialects of Naxi, Bai, and Puroik, as well as Lyuzu and Shuhing) in the eastern Tibetosphere.
N.B. N/A denotes that neither floating nor rhotic phenomena happened.

languages exhibiting 'floating' of the r-sound discussed by Wang et al. (2023), are all spoken in the south-west China (see Roche and Suzuki 2018 for the details of the relevant languages and their distribution) and beyond to the south-east Asia. It is therefore geographically and geolinguistically meaningful that the limited varieties spoken in the south-easternmost Tibetosphere have a striking feature regarding r-sound among the Tibetic languages distributed most widely among Tibeto-Burman.

The last case appears to be the floating phenomenon of /r/. However, the r-sounds discussed as Types A-D in Tibetic languages do not demonstrate floating. Instead, the sound change is arranged in an irreversible relative chronological order. Under floating conditions, a r-glide becomes r-final without losing its consonantal status, as evidenced by Puroik (Wang et al. 2023). Conversely, Type D in Tibetic does not permit this. To ascertain whether the sound change in question is floating, it is necessary to describe the phonetic quality of rhoticisation. This also allows for an examination of the relative chronological order of the r-sound.

Considering the preceding discussion, the emergence of Type D is most probably linked to Naxi. Subsequently, the argument as to how the contact between Tibetic and Naxi is placed in chronological order as presented in 4.3. The rhoticisation process is indicated by Arrow 3 in Figure 3. The r-glide, or /r/, as the main initial would have been as it is for rhoticisation to occur properly in the rhyme part. Process I2 was attested to all varieties, indicating that Type D was spontaneously applied to Yodra (Table 9). Additionally, Type C (C2) appeared in Sems-kyi-nyila, where the r-glide developed into a j-like dorsal sound instead of a rhoticisation of the rhyme part.

5. Conclusion

This article presented a framework for analysing common syllable structures in Tibetic languages. The article then proceeded to enumerate the principal sound changes pertaining to r-glide in the Tibetic languages spoken in the eastern Tibetosphere. Four main types were recognised based on the sound change patterns of the r-glide. One of these presents the influence of the r-glide on the rhyme part (Type D) despite the r-glide being a member of the initial part. The present discussion concludes that Type D is the most recently established type in the relative chronological order. During this process, the r-glide did not exhibit floating but underwent a monodirectional sound change from /r/ as a consonantal status to an abstract rhotic feature functioning as a secondary articulation on a rhyme. The article also included geolinguistic remarks that reinforced the argument that Type D in Tibetic languages has been triggered by language contact with Naxi from a geolinguistic perspective.

The variation and variegated sound changes of r-glide attested in Tibetic languages will also be beneficial for reconstructing more plausible sound changes in other languages, especially within the Sino-Tibetan language family. The findings of this study provide an additional example of the synchrony and diachrony of r-sound, rhotic, and rhoticity in the data of modern spoken varieties combined with ancient phonogramme data.

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【要　旨】

チベット系諸言語における初頭子音 r と r 音性：音節構造からみた分析

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本稿では，チベット系諸言語（シナ・チベット語族チベット・ビルマ語派）においてその古形で母音に接触する初頭子音 r，中でもわたり音位置に現れる r に焦点を当て，東チベットに分布する諸変種における音対応を記述する。その際，音節構造を声母と韻母に分割した音節構造を示し，その中で r が見せる対応関係を 4 タイプに整理する。続いて，初頭主子音 r と末子音 r の場合を含め，音節構造における r の対応を整理して，音変化の相対的な順序を示す。その過程で，韻母に影響を与えるタイプについて詳細に考察する。以上を踏まえ，東チベットからの共時的資料に基づいて r 音の類型論的分析を行い，r が示す音対応とその多様な音形を形成した発展過程を明らかにする。