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The Status of Coronal in the Historical Development of Lhasa Tibetan Rhymes

Beaumont Brush

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Abstract

This paper compares the forms of the historically conservative Written Tibetan with those of the modern spoken dialect of Lhasa Tibetan. The comparison yields several conclusions concerning the historical development of the syllable in Lhasa Tibetan: the relevant feature for analysis is not dental but coronal; historical sound changes have taken place due to constraints at the level of the syllable; and the feature Coronal is underspecified in Written and Lhasa Tibetan according to modified contrastive underspecification and not according to universal coronal underspecification.

1. Introduction*

This paper examines the development of Coronal segments in the Lhasa Tibetan syllable coda from a diachronic perspective. I use Written Tibetan as evidence for the historically antecedent forms of words and compare them with phonetic forms in the modern spoken dialect of Lhasa Tibetan (or simply “Lhasa”). Although the pronunciation of words in Tibetan dialects has changed, the script has not changed since the ninth century, nor has the way the script is used to represent words. Consider the word glossed as ‘fame’ from Written Tibetan: /grags/. While the word used to be pronounced straightforwardly as [grags], its pronunciation in Lhasa Tibetan is [t^ha] (Beyer 1992). The principles on which the comparison between Written Tibetan and Lhasa Tibetan (or simply “Lhasa”) is based will be explained in detail in the following section. For now, note the difference between the forms. These differences between orthographic and surface phonetic forms are most often merely described on a segment-by-segment basis as the “effects” of certain script letters on the pronunciation of the word. Such a description, however, makes no reference to natural classes of sounds or phonological processes that have led to the observed differences. An exception to this trend is the treatment of dentals occurring in the coda, which have been analyzed as a class (Michailovsky 1975, Hume 1992, *inter alia*).

I propose an analysis that more fully explicates the historical sound changes associated with dentals in the Lhasa Tibetan coda by (i) extending the place of articulation from dental to Coronal; (ii) extending the motivation for the sound changes from the segmental domain of features into the prosodic domain of the syllable; (iii) characterizing the interaction of and tension between constraints present in the rhyme, namely, the historical syllable simplification process versus the retention of morphological contrast; (iv) exploring the implications of Coronal markedness for the data and the implications of the data for Coronal markedness. My analysis argues that Coronal in Lhasa Tibetan is underspecified according to modified contrastive underspecification (Avery and Rice 1989) and not according to universal Coronal underspecification as proposed by other researchers (Paradis and Prunet 1989, 1991). Following the analysis, the Coronal underspecification issue is covered in section 5.

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2. Comparing Written Tibetan and Lhasa Tibetan

By comparing the script of Written Tibetan with the pronunciation of Lhasa Tibetan, a modern spoken dialect, we can detect distant shifts that have occurred in the language's phonology. At its inception in the seventh century, the Tibetan script was largely phonetic, comprising 30 consonants, four overt vowels, and one unmarked default vowel, the [a]. Pronunciation was fairly straightforward. The same script, revised in the ninth century, is still in use by literate Tibetans today, with no change in the spelling of words. Previous forms of words in Tibetan have thus been preserved orthographically in written Tibetan, although modern Lhasa pronunciation is quite different.

Returning to our example from the introduction, the segments in /grags/ each represent a Tibetan script letter. The letters are in turn referred to according to their position relative to the “root” letter of the syllable¹ (Goldstein 1993): the [r] is considered the root letter, with a [g] being “prefixed” and the [a] being the underlying vowel. The [g] and [s] in coda position are referred to as the “suffix” and “post-suffix,” respectively. As mentioned before, the script at one time represented a fairly straightforward encoding of symbol and sound. A modern Lhasa speaker, however, will pronounce it as [t^ha].

As Tibetan has evolved and diverged into several spoken dialects, its script letters have been reinterpreted by literate Lhasa speakers as “effects” of the script letters on the pronunciation of the word. This characterization of script letters as having an “effect” on pronunciation is helpful for the learner of Written Tibetan to associate written symbols with non-analogous spoken output. It is, however, misleading to characterize script letters that way in phonological analysis. For example, an /m/ in a syllable coda is seen as a suffix that *adds an [m]*; or an /n/ in the coda is seen not as the phoneme /n/ but as a suffix that *fronts, lengthens, and nasalizes the vowel*. If one conceives of script letters in this way, it sounds as though the [m] and the [n], being “suffixes” that have “effects,” are part of the lexical component of phonology, which they are not. For this reason, I will depart from the usual pedagogical manner of referring to orthographic elements (Goldstein 1993, Beyer 1992) and instead refer to *codas* and *rules of pronunciation*². Table 1 exemplifies the rules of pronunciation that Lhasa-speaking readers of Written Tibetan associate with the segments that may occur in the coda position of a syllable.

¹ See Goldstein (1993) and Beyer (1992) for discussion of the Tibetan orthography.

² It is important to emphasize that “rules of pronunciation” does not refer to active synchronic processes, but to the interpretation of written segments by literate Lhasa speakers.

Table 1. Pronunciation of Written Tibetan segments in Lhasa Tibetan codas

Written Tibetan	Lhasa Tibetan coda pronunciation
b	[p ^ʰ], falling tone, a → ə
m	[m]
g	[ʔ] OR falling tone
ŋ	[ŋ]
BUT	
d	V → [cor], falling tone
s	V → [cor], falling tone
n	V → [cor][nas], VV
l	V → [cor], VV
r	V → VV

Because the coronal series /-d, -s, -r, -l, -n/ is present in the codas of Written Tibetan words, we can infer that at one time coronals were pronounced in the syllable coda. Coronals, however, do not occur in the syllable codas of the speech of Lhasa speakers. Table 1 illustrates that written [b, m, g, and ŋ] are pronounced in the codas of Lhasa, while the coronal series [-d, -s, -r, -l, -n] are not. Instead, the coronals are reinterpreted as rules of pronunciation that affect the vowel quality of the syllabic nucleus. For example, the written /r/ is not pronounced in the Lhasa coda; instead, it is seen as a rule of pronunciation that lengthens the nuclear vowel.

My goal in the following sections is threefold: to present data that will exemplify the differences between codas in Written Tibetan and Lhasa Tibetan (section 3), to propose an analysis of the special behavior of coronals as a class in the development of the Lhasa Tibetan coda (section 4), and to examine the implications of both the data and the analysis so constructed for Coronal underspecification theory (section 5).

3. Data

The following table illustrates the phonological changes that the Tibetan rhyme has undergone. The data in this table were provided by and elicited from Deji-Sezhen Geziben (Geziben 1994), a native of Lhasa and a linguistics graduate student at the University of Texas at Arlington. They are represented by a transliterated version of the written script, that is, a romanized representation of the phonetic sounds that the script letters symbolized. As this analysis is not dependent on tones, tone graphs are omitted from words.

Table 2. The pronunciation of Written Tibetan words in Lhasa Tibetan

Written Tibetan	Lhasa pronunciation	Gloss
khap	k ^h əp̚	‘needle’
tham	t ^h am	‘tight’
thag	t ^h aʔ	‘rope’
thang	t ^h aŋ	‘ground’
BUT		
chad	tʃ ^h ɛ	‘break’
nas	nɛ	‘barley’
phan	p ^h ɛ̃:	‘benefit’
bal	p ^h ɛ:	‘wool’
ɕar	ɕa:	‘east’

Of all the possible segments that may occur in the coda position of Written Tibetan, /b, m, k, ŋ, d, n, r, l, s/ (where the /r/ is retroflex), only the labial and dorsal segments [b, m, k, ŋ] have remained and may be pronounced, as seen by their realization in the codas of the Lhasa words [k^həp̚], [t^ham], [t^haʔ], and [t^haŋ]. The coronals /d, n, r, l, s/ are not pronounced, as seen by their absence in the codas of the Lhasa words [tʃ^hɛ], [nɛ], [p^hɛ̃:], [p^hɛ:], and [ɕa:], despite their presence in the Written Tibetan codas.

Out of consideration for space the [a] is the only vowel represented in the Written Tibetan column, but the Written Tibetan non-front vowels [u,o,a] all undergo fronting to [y,ø,ɛ] respectively. Table 2 highlights the fact that coronals not only are no longer pronounced in the coda, but they also have altered the vowel quality of the nucleus: in some cases the coronal has caused the vowel to front (/nas/ → [nɛ] and /chad/ → [tʃ^hɛ]), in some cases it has caused the vowel to lengthen (/ɕar/ → [ɕa:]), in some cases it has caused both (/bal/ → [p^hɛ:]), with the addition of nasalization in one case (/phan/ → [p^hɛ̃:]). In the next section I present an analysis that explains why the coronals in the codas behave differently than the non-coronals. Furthermore, the analysis accounts for the fact that not all coronals participate in the processes in exactly the same way.

Difference in pronunciation is seen most consistently in monosyllabic or word-final syllables in regular speech, though there is at least some variation in the pronunciation of all syllables resulting from the influence of the orthography when written text is read aloud. As well, knowledge of the orthography sometimes affects a literate speaker’s pronunciation of words in isolation, as noted by Sprigg (1991). An example of another variation that may occur is the realization of /d/ in the coda as a glottal stop, though that variation is articulated primarily by older speakers (Edmondson *et al.* 1995). There is also variation in the other finals: they too may not be articulated, or may have some effect on

the vowel. For example, the /p/ causes some very selective fronting and raising. While there are conflicting reports on the variable status of the other finals in Lhasa Tibetan, the coronals consistently affect the vowel quality and are not pronounced.

4. Analysis

In accounting for the data here, I present the relevant historical processes and constraints that have emerged and conspired to produce these surface forms. I also explain the reasons for the varying behavior of coronals in the processes as a result of the presence of other features in the coronal segments, such as sonority, nasality, and retroflexion. The constraints proposed here are not considered to have appeared suddenly and targeted all affected segments simultaneously, but are considered to have emerged slowly and incrementally, affecting more frequently occurring segments and words first, and eventually spreading throughout the language.

The following analysis characterizes the historical process by which the Lhasa Tibetan syllable has eroded (4.1), with a current constraint in Lhasa Tibetan against coronals in the syllable coda (4.3). Morphological contrast has not been lost with the loss of the coronals, however, because of a *Coronal Assimilation* from coda to nucleus (4.2) and a subsequent *Compensatory Lengthening* of the nuclear vowel (4.4). Subsections cover the reasons for the varying behavior of certain coronals in each process, and derivations (4.5) demonstrate graphically how the processes affected the data from Table 2. Finally, section 5 discusses the implications of the analysis of Coronal underspecification theory and argues that Coronal is not radically underspecified in Lhasa Tibetan.

4.1 Syllable simplification

The first factor contributing to the phenomena illustrated in Table 2 is the historic *Syllable Simplification* process in Tibetan, as described by Geziben (1995). The Tibetan syllable has gradually developed from a CCCCVC template in Ancient Tibetan, still observable in Written Tibetan, to CVX in Lhasa Tibetan, where X may be either a consonant or vowel.

The Ancient Tibetan syllable template in Figure 1 shows the maximal Tibetan syllable at that time, with four onset slots and two coda slots, as in the word *bsgrims*, which is glossed ‘twist with finger.’ Over time the constituents of this template have eroded away, with various sound changes emerging to preserve contrast. The modern Lhasa Tibetan reflex of Figure 1, as shown in Figure 2, is now a CVC syllable, pronounced [tʂim]. Because the Tibetan syllable has consistently tended toward simplification, I include the simplification process among the other processes outlined in this section that are present and that conspire to produce the surface forms under examination. These tendencies simultaneously interact and are in competition with each

other. In light of the simplification process, I place the domain of the constraint against coronal codas within the prosodic domain of the syllable.

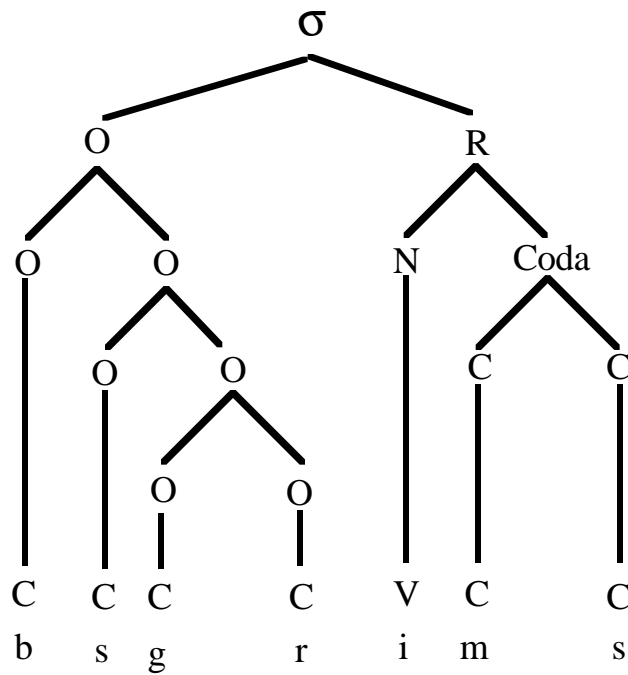


Figure 1. Ancient Tibetan Syllable Template

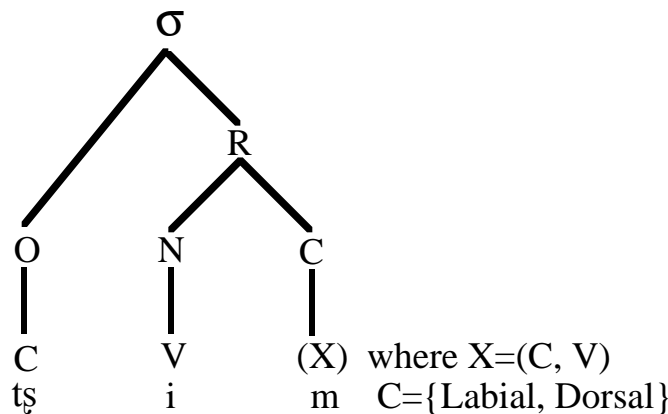


Figure 2. Lhasa Tibetan Syllable Template

Although the analysis of the syllable will later refer to syllabic weight, which is represented by moras, the onset-rhyme notation of the templates in Figures 1 and 2 is revealing for the hierarchy of the syllable constituents. It is revealing for both the onset, which plays an important role in the simplification process (Geziben 1995), and the rhyme, which is notationally convenient to refer to when discussing interaction between the right-edge consonant and vowel in a syllable, or “nucleus” and “coda”. A strictly moraic framework would not allow for reference to these constituents separately. While

the segmental constituents of the syllable have changed quite dramatically, the weight of the syllable has remained maximally bi-moraic and optionally mono-moraic³; see 4.4 for further discussion of the relevance of syllable weight.

4.2 Coronal Assimilation

At some point in the history of the language the non-front vowels in the nucleus became fronted. This phenomenon has typically been treated as the assimilation of the vowel to the [–back] of the coda consonant. However, following the feature geometry proposed by Clements and Hume (1995), an assimilation of this sort is more accurately characterized as the coronalization of the vowel, in that the relevant feature that spreads is not [–back], but Coronal. As both Hume (1992) and Odden (1991) have pointed out, the spreading of the feature [–back] is not a straightforward account of the effect of coronal consonants on preceding non-front vowels, because if that were the case all coronal consonants would have to be specified for [–back], which is a vocalic feature. Furthermore, [back] is typically located under the dorsal Place node. For this reason, the interaction between the coda and the nucleus in these data is characterized as a *Coronal Assimilation*, as shown in Figure 3.

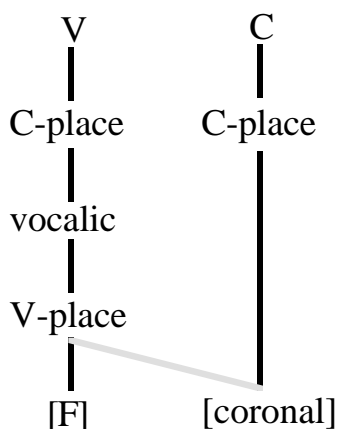


Figure 3. *Coronal Assimilation*

Under this analysis the structure of vowels and consonants is slightly different than geometries that do not allow vowels and consonants to share place features. This geometry (Clements and Hume 1995) proposes the addition of the Vocalic and V-place nodes for vowels. Place features are shared by vowels and consonants, and each place feature is on its own tier, which allows for a straightforward representation that explains why the non-front, or Dorsal nucleus became fronted before a coronal consonant: Coronal can spread from coda to nucleus, and from consonant to vowel. This association,

³ Moraicity in Lhasa Tibetan syllables is a function of sonorancy (see 4.4), which allows for mono-moraic syllables; whether sonorancy determined moraicity in Ancient Tibetan remains a question for further research, as does the significance of the stability of the moraic structure.

reflecting the right-to-left directionality parameter of the syllable, adds Coronal to the specification of the vowel, making it a front vowel. Additionally, there is a standard nasal assimilation. In this model, [nasal] is a dependent of the root node, and so associates from the coda to the root node of the nucleus.

The question that could now be asked is: does Coronal associate to the vowel as a faithfulness strategy in response to the restriction against Coronal, or does the restriction against coronals remove the coda because the vowel has become an allophonic coronal vowel and the coda is therefore redundant? If the following phonetic basis of the *Coronal Assimilation* is considered along with the *Syllable Simplification* process, there is a natural motivation for the latter ordering of events. I will characterize these events as the Coronal constraint (4.3) working in concert with *Syllable Simplification* to unlicense coronal codas in response to the *Coronal Assimilation*.

The phonetic motivation for the assimilation is provided by Michailovsky (1975). A major factor of stop recognition is the formant frequency transition from the preceding vowel. Before the dental series [-d, -n, -l, and -s], non-front vowels “have rising F2 transitions, which corresponds to movement forward in the vowel space” (327). The transition subsequently phonologized in Lhasa, with the transition itself emerging as the reinterpreted contrastive feature of the nucleus. Hari (1979) notices that the only front vowels that occur in the speech of Lhasa Tibetans are before orthographically coronal codas. She argues that although front vowels are contrastive in speech, they are front allophones of non-front vowels followed by orthographic coronal codas. Phonologically, her position supports the representation of the Coronal place spreading to the vowel. The phonologization of the F2 transition corresponds to the assimilation of Coronal, a front-space feature. A hypothesis following from this characterization of the assimilation is that once the contrast that the coda provided was encoded on the nucleus in the front vowels, the *Coronal Edge Constraint* (4.3) was free and perhaps more likely to occur because of the redundancy of the coronal coda as against the nucleus, which had assimilated Coronal as a result of *Coronal Assimilation*.

4.2.1 Retroflexion

Although the retroflex /r/ does participate in other processes that target coronals, it does not participate in the assimilation, so /chad/ → [tʂ^hɛ] but /ɕar/ → [ɕa:]. Coronal here is taken to be the noncontrastive [+anterior] specification which spreads, in keeping with the *Node Activation Condition* (Avery and Rice 1989). This analysis in a sense “splits the difference” between radical and contrastive underspecification. For a dependent feature such as [anterior], the theory of radical underspecification predicts that only the place node of the marked dependent feature is marked underlyingly. Since [+anterior] is considered the unmarked Coronal value, its place node is bare, while the place node for the marked [–anterior] specification is marked for both Coronal and [–anterior]. Contrastive underspecification predicts that if there is a dependent feature that is contrastive for a place node, e.g. [anterior], then each place node must be marked for both

Coronal and [anterior] underlyingly (Archangeli 1988). The *Node Activation Condition* states that if a dependent feature is the only contrastive feature between two segments, as in [–anterior] for coronals, then both segments will be underlyingly marked for place, but only the dependent feature of the marked segment—in this case retroflex—will be specified (Avery and Rice 1989). Further implications of this sort of specification, called *Modified Contrastive Specification* by Paradis and Prunet (1991), are discussed in section 5. Retroflex is characterized as [–anterior]⁴ and so it is the marked contrastive segment and does not spread.

Among the possible reasons why the retroflexed coronal segment would not spread its place node like other coronal segments is that retroflex is not represented in the same way as other coronals. One argument is that retroflexes are most accurately represented as having a complex place node with a dorsalized coronal (cf. Cho 1990), characterized as a branching place node with Coronal on one branch and the vocalic node with a dependent Dorsal articulator on the other. Thus a retroflex would not be read the same way as other coronals by the assimilation process. At this point the optimal representation of retroflexes is an open question, and so their behavior is not yet completely representation-driven, but will require phonetic information. In light of the phonetic motivation for the *Coronal Assimilation*, we see that retroflex segments do not produce the rising F2 transition in the nucleus that the dentals do. Since it was the rising F2 transition that triggered the assimilation and subsequently phonologized, the absence of that transition in the retroflexes explains why the retroflex [r] did not trigger the same assimilation..

4.3 Coronal Edge Constraint

During the evolution of Lhasa Tibetan, coronals became unlicensed in the syllable coda, were subsequently delinked, and thus lost from pronunciation. The motivation for the loss of the coda is formally characterized as the *Coronal Edge Constraint*.

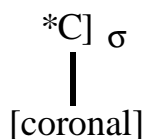


Figure 4. Tibetan Coronal Edge Constraint

This characterization captures the fact that Coronal is unlicensed at the prosodic level of the syllable. Building on the phonetic analysis of the *Coronal Assimilation*, the *Coronal Edge Constraint* is hypothesized as a response to the dual forces of *Syllable Simplification* and coronal coda redundancy, as shown in Figure 4. Once coronal contrast was preserved on the nucleus through the assimilation, the *Coronal Edge Constraint* could then apply to unlicense the redundant coda. Unlike the other processes of

⁴ Alternatively characterized as [retroflex] by Avery & Rice (1989).

assimilation and lengthening, the edge constraint applies to all coronals equally, so that no coronal segments are ever left in the Tibetan coda. Coronals deleting as a class is taken as sufficient motivation to talk about the common behavior of coronals in Tibetan as against the more specific class of dentals. However, that a syllable would have a constraint against coronals in the coda is unusual in light of some of the assumptions of coronal markedness. I take up this issue in section 5.

4.4 *Compensatory Lengthening*

Subsequent to the delinking of coronal codas, *Compensatory Lengthening* followed naturally and necessarily because the mora previously associated with the coda can not remain unassociated, as in Figure 5. All of the coronal codas in the data of Table 1 exhibit replacement by long vowels, except the /d/ and /s/, the asymmetry of which is seen as a function of the effect of sonorancy on syllable weight, following Zec (1995). Sonorancy affects syllable weight in Tibetan by the fact that non-sonorant segments do not project a mora. Because there is no mora dominating the non-sonorant segment for the nucleus to associate to, as is the case with /d/ and /s/, *Compensatory Lengthening* had no target and thus was not triggered. The formal statement of the constraint on moraicity is characterized as the *Tibetan Moraicity Constraint*, Figure 6.

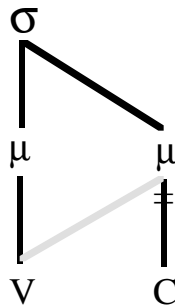


Figure 5. *Compensatory Lengthening*



Figure 6. *Tibetan Moraicity Constraint* (cf. Zec 1995: 112)

Having explained the processes that the coronals in the data undergo and having accounted for the non-participation of some of the segments in these processes, we now look at the derivations.

4.5 Derivations

The derivations represent the constraints and processes discussed thus far, as well as their asymmetrical application to the data. In Figure 7, Coronal spreads from the [+anterior] noncontrastive coronal nodes of /ban/, /phan/, and /chad/, but not from the [-anterior] contrastive coronal, which is the retroflex. Thus /ɕar/ does not become [ɕa], but remains /ɕar/.

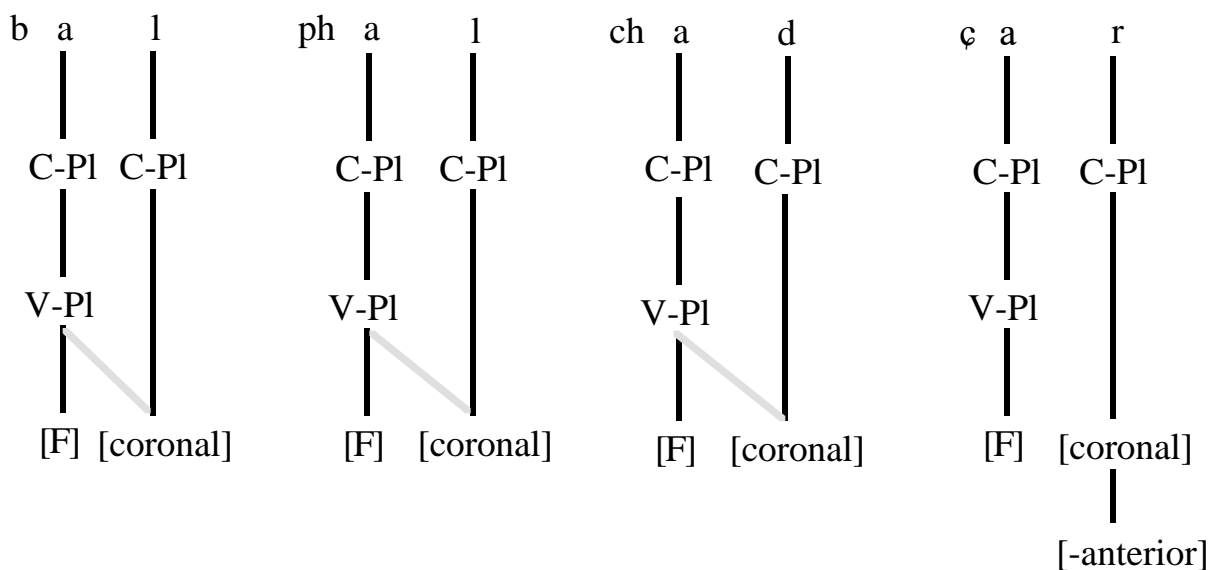


Figure 7. Coronal Assimilation

Next, Figure 8 shows the effect of the *Coronal Edge Constraint*: delinking of the coronal segment in the coda, with the result being *Compensatory Lengthening*. Figure 8 also illustrates why Compensatory Lengthening does not target the empty [d] slot: it is because [d], being non-sonorant, does not project a mora, and so there is no skeletal slot that the vowel can lengthen to. Thus /ched/ does not become [che:] but remains /ched/.

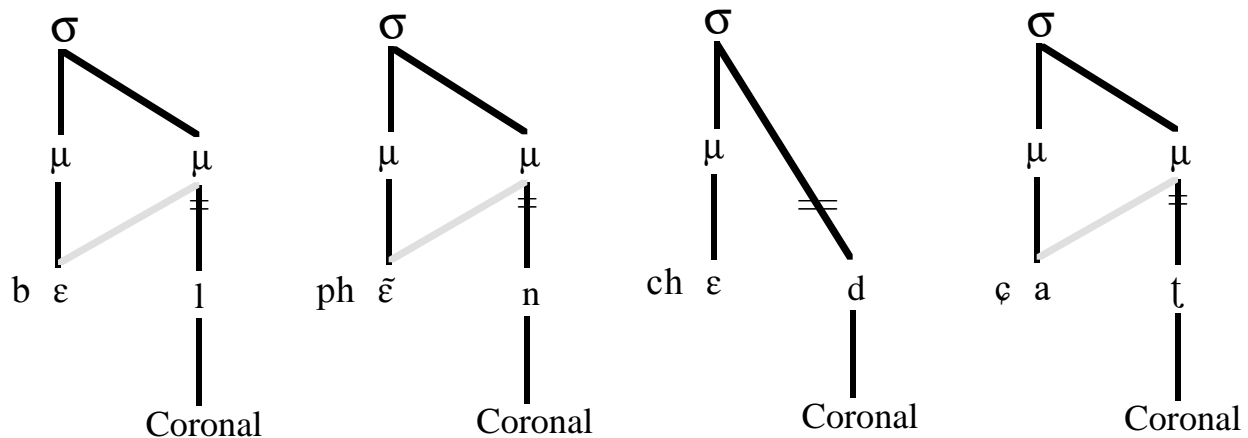


Figure 8. Coronal Edge Constraint with Compensatory Lengthening

Table 3 represents the same derivations of the surface forms over the course of the entire process and shows the output of each step. Transliterated Written Tibetan forms appear across the top, followed by the ordered processes discussed in the previous sections.

Table 3. Derivations

Written Tibetan	bal	phan	chad	ɕar
Coronal Assimilation	p ^h ɛl	p ^h ẽn	tɕ ^h ɛd	---
Coronal Edge Constraint	p ^h ɛ	p ^h ẽ	tɕ ^h ɛ	ɕa
Compensatory Lengthening	p ^h ɛ:	p ^h ẽ:	---	ɕa:
Lhasa Tibetan pronunciation	p ^h ɛ:	p ^h ẽ:	tɕ ^h ɛ	ɕa:
Gloss	'wool'	'benefit'	'break'	'east'

5. Coronal markedness

The data above indicate that coronals behave asymmetrically with respect to the other consonants in the coda position, which is not unexpected, given their attested special status (Paradis and Prunet 1989, 1991 *inter alia*). Most often coronals are considered special by virtue of their universally lacking a place node. However, as we will see, the Lhasa Tibetan phenomena described here can not be attributed to the lack of a place node.

In the study of Coronal underspecification, there has been tension between (i) the point in the phonology at which an unmarked place node *becomes specified* for Coronal and (ii) the clear cases of coronal asymmetry which seem most plausibly to be the result of the place node *remaining unspecified*. Some arguments depend on Coronal being specified early in the derivation, even during Morpheme Structure Constraints, and some

arguments depend on a default rule that fills in Coronal late in the derivation, even last. McCarthy and Taub (1992: 368) state

Sometimes coronal consonants are special by virtue of phonological inactivity or invisibility, and these cases form the core of evidence that Coronal is underspecified. In another set of cases, the special behaviour of coronals requires actual specification of Coronal to support dependent features and to engage in assimilation. These conflicting demands have not yet been successfully reconciled.

The Tibetan forms under examination demonstrate some of the conflicts described by McCarthy and Taub. The first tendency of underspecified Coronal that these data do not support is the assertion that [+anterior] coronals tend to be invisible to deletion, as argued by Paradis and Prunet (1989, 1991). In Lhasa Tibetan, all coronals were subject to deletion. With radical underspecification, we would expect the [+anterior] phonemes to be completely unmarked for place and thus be transparent to the assimilation, which would then target the [–anterior] retroflex; in fact, the assimilation specifically selects the default [+anterior] coronal. Thus, the tendency for [+anterior] coronals to be invisible to deletion does not hold in this case, because all coronals in these data are subject to deletion. What is more, Coronal must be specified in Tibetan because the *Coronal Edge Constraint* does not differentiate between contrastive and noncontrastive coronals.

Second in the set of conflicts are the tendencies associated with coronals in coda position. Itô (1989), reformulated by Yip (1991), posits a restriction against codas having a place node. By default, Coronal would later be specified by redundancy rule, which explains a tendency for codas to be coronal segments, if codas are allowed in the language at all. Codas may be specified for Coronal either by simplification rules that create coronal codas or by the restriction against the place node, by which Coronal is later inserted by a redundancy rule. In Tibetan, coronal codas display tendencies opposite the ones predicted by Coronal underspecification by not being the only coda allowed in the language, but by being the only coda *not* allowed. This is the case because when the language loses codas, Coronal is the first place of articulation to delete, having been marked for Coronal and targeted by the *Coronal Edge Constraint*.

Last, Coronal is generally considered to be a target for assimilation because of its bare place node, but here it is a trigger and must therefore be marked, because although phonological rules may differentiate between the presence versus the absence of a slot, they may not refer directly to the absence of a slot. From these arguments I conclude that these data support the argument for *Modified Contrastive Underspecification* for Coronal, which predicts that Coronal was marked in the language due to the dependent contrastive feature [–anterior] that it supports.

6. Conclusion

In this paper I have expanded the scope of a class of historic sound changes in Tibetan rhymes from dental to Coronal. The consequence of this expansion has been to include the retroflex /r/ with the dental finals [-d, -s, -l, -n] because it is part of phonological processes that target coronals (and therefore dentals). The /r/, due to its specification of [-anterior], does not participate in the *Coronal Assimilation*, which targets only those coronals specified only for Coronal and no other dependent feature such as [-anterior]. The /r/ does, however, participate in the *Coronal Edge Constraint*, which in turn causes *Compensatory Lengthening*. This analysis accounts for the behavior of a wider range of Lhasa finals. I have also extended the domain of application of processes from the segment to the syllable, which allows for reference to the *Syllable Simplification* process. The *Coronal Edge Constraint* also makes reference to the syllable, as does *Compensatory Lengthening*. The segmental changes shown in Table 2 are seen as a result of the tension between the preservation of morphological distinctness as against this historical tendency of Lhasa Tibetan to simplify its syllable template. Contrast has been preserved by transferring coronality from the coda position to the nucleus. I have concluded by relating the status of Coronal in Lhasa Tibetan to the study of Coronal underspecification. These data demonstrate a reversal of the tendency of coronals to be the only allowable coda segments in a language, if that language allows codas at all. In Lhasa Tibetan, coronals are typically the only segments that are *not* allowed. and have argued that Coronal is marked in these processes through modified contrastive underspecification.

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Questions/Comments: SILEWP@sil.org

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