Rhyme constraints in Southern Tutchone (Dene): A focus on nominals

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Abstract

Southern Tutchone (*Dän k'è*) is a Northern Dene (Athapaskan) language spoken in the southern Yukon. This thesis, using newly collected data from fieldwork conducted in the summer of 2022, provides an analysis addressing restrictions on the shape of the noun stem. I propose that limitations on the noun stem rhyme are due to interaction of underlying vowel length, vowel place features and consonant place features. Noun stems are monosyllabic and highly restricted in terms of rhyme shape: schwa cannot appear in open syllables, only central vowels can precede codas, and possible codas are a subset of coronals. First, I provide an analysis that shows that the distribution of vowels is best captured with reference to distinctions in both weight and featural content. Second, I show that the interaction of coda consonants and preceding vowels is best captured by appealing to featurally impoverished representations, geometrically organized features and prosodic licensing.

Résumé

Le tutchone du sud (*Dän k'è*) est une langue dénée (athapascane) septentrionale qui est parlée dans le sud du Yukon. Ce mémoire, utilisant de nouvelles données cueillies en été 2022, fournit une analyse abordant les restrictions sur la forme du radical nominal. Je propose que les restrictions sur la rime soient dues à l'interaction de la quantité vocalique et en plus des traits de lieu des voyelles et des consonnes. Les radicaux nominaux sont monosyllabiques et très limités en termes de forme de rime : le schwa ne peut apparaître dans les syllabes ouvertes, seules les voyelles centrales peuvent précéder les codas et les codas possibles ne comprennent qu'un sous-ensemble de consonnes coronales. Je démontre d'abord que la distribution des voyelles est mieux modélisée en se référant à des distinctions de poids syllabique et de traits de lieu. Je démontre ensuite que les contraintes sur les séquences voyelle-coda sont mieux modélisées en faisant appel à des représentations sous-spécifiées, à des traits organisés géométriquement et au licenciement prosodique.

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Chapter 1: Introduction

Noun stem rhymes in Southern Tutchone (*Dän k'è*), a Northern Dene (Athapaskan) language, are highly constrained. I show that such constraints are due to interaction of underlying vowel length, vowel place features, consonant place features and constraints on prosodic licensing. This chapter provides an introduction to the language context, including work on revitalization and education (1.1), and its relationship to other Na-Dene languages (1.2). Then, sources of data and previous work (1.3) as well as the presentation of data in this thesis (1.4) are addressed. The orthography, inventory and tonal system are introduced in 1.5, and the theoretical framework adopted in this thesis is introduced in 1.6. Finally, the organization of the thesis is given in 1.7.

1.1 Language context

Southern Tutchone is a critically endangered language (Moseley, 2010). By the early 1960s, there were around 1,000 speakers of Northern and Southern Tutchone combined (Chafe, 1962), with numbers remaining stable as of 1970 (Krauss, 1973). Numbers have since declined rapidly; by 1999, Southern Tutchone had 200 adult speakers (Mithun, 1999, p. 350), and in the 2021 Canadian census, 65 people gave Southern Tutchone as their mother tongue, while five of these individuals stated it was the language they spoke most often at home (Statistics Canada, 2022).

In language teaching, Southern Tutchone is divided into four main mutually intelligible dialects: Aishihik (*Äshèyi*), Kluane (*Lù'àn mān*), Klukshu (*Łú ghą*), and Lake Laberge (*Tàa'an mān*). The dialects historically corresponded to areas of Southern Tutchone territory; however, most Southern Tutchone people now live in Whitehorse (*Kwänlin*) or Haines Junction (*Dakwàkàda*) (McClellan, 1981; YNLC, 1997/2017). There are also four First Nations with significant Southern Tutchone membership: Champagne and Aishihik First Nations, Kluane First Nation, Kwanlin Dün First Nation and Ta'an Kwäch'än Council.

Language revitalization of Southern Tutchone was initiated by Daniel L. Tlen, a speaker of the Kluane dialect and a consultant for this project, in the 1970s. Tlen (1986) reported on the current condition of Indigenous languages spoken in the Yukon, including Southern Tutchone, making recommendations for their revitalization. Numerous publications and workshops have focused on literacy and documentation of vocabulary, including Tlen (1993), a noun dictionary

in the Kluane dialect, and regular literacy workshops at the Yukon Native Language Centre (YNLC).

The role of language in Southern Tutchone culture, particularly as it relates to narrative, is addressed in the work of Catharine "Kitty" McClellan (McClellan, 1970, 1975a, 1975b, 2007) and Julie Cruikshank (Cruikshank, 1990b, 1997, 1998). Additional sources of published narrative, both in Southern Tutchone and in English translation, include Allen and Allen (2006), Kwanlin Dün First Nation (2020) and Workman (2010). Work has also taken place on the importance of traditional place names (Cruikshank, 1990a), with educational materials including interactive maps produced by YNLC starting in the 1990s (YNLC, 1997, 2007, 1997/2017). Moore and Tlen (2007) examined the importance of place and direction in the speech of fluent speakers as a means of promoting cultural identity.

1.2 The Na-Dene language family

Southern Tutchone is a Northern Dene language, within the Dene (Athapaskan/Athabaskan) language family and larger Na-Dene (Athabaskan-Eyak-Tlingit) family. Na-Dene languages are typified by strongly head-final constructions, complex verbal morphology (often described using a verbal template), and a lack of labial stops and fricatives (Leer, 2006). The Northern Dene grouping is part of the traditional tripartite division of the Dene family which does not represent genetic relationships between languages: Northern (Alaska and northwestern Canada), Pacific Coast and Southern/Apachean (southwestern US and northern Mexico) (Jaker et al., 2020). The map in (1) shows the geographic extent of the Na-Dene language family, which consists of the Dene languages, Eyak and Tlingit.[1]

[1] In the legend, labels for boundaries dividing languages and dialects are reversed. From "The Athabaskan (Dene) Language Family," by Keren Rice and Willem de Reuse, in Alexandra Aikhenvald & R. M. W. Dixon (Eds.), *The Cambridge Handbook of Linguistic Typology* (p. 708), 2017, Cambridge University Press. Copyright 2017 by Keren Rice (reproduced by David Cox for Cambridge University Press). Reproduced with permission of Cambridge University Press through PLSclear.

(1) **Map of Na-Dene languages** (Rice & de Reuse, 2017, p. 708)

Within Northern Dene in particular, Leer (2006) highlighted the difficulty of distinguishing genetic from areal features due to significant language contact between Dene peoples (see also Krauss & Golla, 1981). Nevertheless, Keren Rice places Southern (and Northern) Tutchone into her Tanana-Tutchone grouping with Lower Tanana, Tanacross, Upper Tanana and Upper Kuskokwim (Mithun, 1999; Tuttle & Hargus, 2004). Phonologically, Southern Tutchone has much in common with the geographically closest Tanana-Tutchone languages Northern Tutchone and Upper Tanana, with vowel systems in these languages expanding through the absorption of features from historic codas (UT, Lovick, 2020, pp. 100–104; NT, ST, Ritter, 1976).

Dene peoples have a long history of multilingualism, shaped by both cultural and economic interaction (Krauss, 1981). Contact with Tlingit traders, whose language is distantly related to Southern Tutchone, introduced many elements of Tlingit culture into Southern Tutchone communities (McClellan, 1953). The Tlingit language gained an important role in Southern Tutchone society (Vanstone, 1982), introducing many loanwords related to traded goods. Marriage between peoples predates the formation of contemporary Yukon First Nations (Nadasdy, 2012), reflected in the Southern Tutchone, Tagish and Tlingit ancestry of members of the Kwanlin Dün First Nation and Ta'an Kwäch'än Council.

1.3 Data sources and previous work

Southern Tutchone data is cited in reconstructions of Proto-Dene (e.g., Leer, 2005; Rice, 1997), and there are also handouts from presentations on historical phenomena given by John T. Ritter archived at YNLC (Ritter, 1976, 1982, 1983). In addition, Daniel L. Tlen, a Southern Tutchone community linguist and teacher, has produced numerous unpublished manuscripts documenting regularities and paradigms in Southern Tutchone grammar (Tlen, 2007a, 2007b, 2007c, 2008a, 2008b). Tlen also published a noun dictionary of the Kluane dialect (Tlen, 1993) and continues to produce educational materials (e.g., Tlen, 2018, 2022). There are two orthographies for Southern Tutchone: one developed by YNLC and the other by Tlen. Additional materials from YNLC include regularly published literacy sessions and a draft noun dictionary (with recordings) (YNLC, 2002). Aside from these examples, Southern Tutchone has not received significant attention in the broader linguistic literature.

The data in this thesis is primarily drawn from my own fieldnotes and recordings collected in June 2022, in addition to notes from periodic meetings with Tlen during 2021–2023. The fieldwork was conducted at YNLC with consultants Nakhela "Hazel" Bunbury (Lake Laberge dialect) and Daniel L. Tlen (Kluane dialect). Sessions with Tlen also included James A. Crippen, whose notes provided an additional record of our discussions. Fieldnotes, recordings and time-aligned transcriptions from my fieldwork are archived at YNLC.

1.4 Data presentation

All Southern Tutchone data in this thesis is given in orthography and broad phonetic transcription, with some examples including a phonemic transcription. Orthography is presented in two formats: letters are given in angle brackets (e.g., <t>), while words are written in italics (e.g., *thü* 'pants'). As mentioned above, there are two orthographies for Southern Tutchone with different motivations: The YNLC orthography was developed from a linguistic perspective, aiming to be a phonetic transcription that is consistent with similar orthographies for other Dene languages in the Yukon. The Tlen orthography, on the other hand, was developed from a pedagogical perspective, avoiding layered diacritics and omitting certain predictable alternations (including nasal fortition). I adopt the YNLC orthography, with the addition of the vowel <ë> to represent [(j)ɛ], which is more commonly written as <e>.[2] The phonemic status of <ë> is addressed in 5.1. Correspondences between the adapted orthography and IPA are given in 1.5. Additional correspondences between the adapted, YNLC and Tlen orthographies are given as Appendix 1. I follow the practice of YNLC in not leaving a space between possessive prefixes and stems (cf. Tlen, 2018). Inalienable or possessed nouns have an initial hyphen (e.g., *-mbat* 'older sister'), and standalone prefixes have a trailing hyphen (e.g., *á-* 'my').

Contrasts between plain, aspirated and ejective stops are marked by diacritics in IPA transcriptions (i.e., [t, tʰ, t']), rather than the convention in Dene linguistics to use voiced and voiceless symbols for plain and aspirated stops, respectively (i.e., [d, t, t']). In IPA transcriptions, high tone is not marked, while low tone is marked with a grave accent (V̀), falling tone with a circumflex accent (V̂) and rising tone is marked with a haček (or caron) (V̌). Different tone

[2] Tlen uses <ë> to refer to the fronted production of <ä> as [ɛ] in prefixes which I transcribe as <ä>. Fronting of <ä> is discussed in 5.1. I also adopt Tlen's practice of writing ejective labialized consonants as <C'w> rather than YNLC's <Cw'>.

diacritics are used in the orthography, as shown in 1.5.3. Long vowels are marked with a length diacritic (V:). Nasalization is indicated by an ogonek (Ɣ) in both orthography and IPA.

1.5 Segmental and tonal overview

This section provides a brief introduction to the consonant and vowel inventories of Southern Tutchone in 1.5.1 and 1.5.2, respectively. 1.5.3 then gives an overview of the tonal system of Southern Tutchone.

1.5.1 Consonants

Southern Tutchone has 42 surface consonants, with a wide range for both manner and place dimensions. As is typical for a Dene language, stops and affricates are voiceless unaspirated (plain), aspirated or ejective, while fricatives are voiceless or voiced. The phonetic inventory with orthographic representations is given in (2).

(2) **Southern Tutchone consonant inventory (phonetic)**

	Labial	**Coronal**					**Dorsal**		**Glottal**
Nasal	m <m>		n <n>						
	^{m}b <mb>		^{n}d <nd>			^{n}dʒ <nj>			
Stop/ affr.		tθ <ddh>	t <d>	ts <dz>	tɬ <dl>	tʃ <j>	k <g>	k^{w} <gw>	ʔ <’>
		tθ^{h} <tth>	t^{h} <t>	ts^{h} <ts>	tɬ^{h} <tl>	tʃ^{h} <ch>	k^{h} <k>	k^{hw} <kw>	
		tθ’ <tth’>	t’ <t’>	ts’ <ts’>	tɬ’ <tl’>	tʃ’ <ch’>	k’ <k’>	k’^{w} <k’w>	
Fric.		θ <th>		s <s>	ɬ <ł>	ʃ <sh>	x <kh>	x^{w} <khw>	h <h>
		ð <dh>		z <z>	l <l>	ʒ <zh>	ɣ <gh>	ɣ^{w} <ghw>	
Approx						j <y>		w <w>	

The orthography expresses major allophones with separate symbols. As expected, the phonemic inventory, provided in (8) below, is somewhat smaller in size.

By comparing (2) and (8), we can see that the laryngeal specification of stops and affricates is phonemic, while fricative voicing is allophonic. Fricatives are underlyingly voiceless and become voiced when preceded by a sonorant. Such alternations are seen in possessive constructions: in fricative-initial nouns, the unpossessed form has an initial voiceless fricative

(3), but it becomes voiced in the possessed form (with a sonorant-final prefix) (4). Stops and affricates do not alternate.

(3) **Unpossessed (voiceless) fricative-initial noun stems**

łù	[łùː]	‘whitefish’
khal	[xaːl]	‘sled’

(4) **Possessed (voiced) fricative-initial noun stems**

nlù	[n̩lùː]	‘your whitefish’
ughāl	[ʔuɣâːl]	‘his/her sled’

Laryngeal features are further addressed in 4.1. Similar patterns are seen throughout the Dene language family (e.g., Rice, 1994).

Further comparison of (2) and (8) shows that prenasalized stops are allophones of plain nasals. Nasals undergo fortition (to prenasalized stops) in stem-initial position unless they are followed by either a nasalized vowel or a vowel with a nasal coda (5).

(5) **Plain nasals in onset position**

a.	*-mą*	[mąː]	‘mother’
	-nį̀	[nį̀ː]	‘face’
b.	*män*	[mən]	‘lake’
	nän	[nən]	‘you’

Underlying labial nasals are strengthened to [ᵐb] (6). Underlying alveolar nasals have two strengthened forms: [ⁿdʒ] before high or front vowels, and [ⁿd] elsewhere (7).

(6) **Strengthened labial nasals**

mbà	[ᵐbàː] ‘war’
mbäy	[ᵐbəj] ‘sheep’

(7) **Strengthened alveolar nasals**

a.	*nji*	[ⁿdʒiː]	‘food’
	njù	[ⁿdʒùː]	‘upriver’
b.	*nda*	[ⁿdaː]	‘medicine’
	ndäl	[ⁿdəl]	‘white-winged scoter’

I return to nasal fortition as it relates to morphological domains in 2.1. Nasal fortition in Southern Tutchone closely resembles the pattern exhibited by the alveolar nasal in related Tanacross (Holton, 2000, pp. 53–57).

Taking into account the lack of phonemic voiced fricatives and prenasalized stops, the phonemic consonant inventory of Southern Tutchone is given in (8).[3]

(8) **Southern Tutchone consonant inventory (phonemic)**

	Labial	**Coronal**					**Dorsal**		**Glottal**
Nasal	m		n						
Stop/ affr.		tθ	t	ts	tɬ	tʃ	k	k^w	ʔ
		$tθ^h$	t^h	ts^h	$tɬ^h$	$tʃ^h$	k^h	k^{hw}	
		tθ’	t’	ts’	tɬ’	tʃ’	k’	$k’^w$	
Fric.		θ		s	ɬ	ʃ	x	x^w	h
Approx						j		w	

1.5.2 Vowels

The inventory of vowels in Southern Tutchone is given in (9). There are additionally two rhotacized vowels, <ür, är> [ɨ˞, ə˞], two rising diphthongs, <äy, äw> [əj, əw], and a falling diphthong, <ë> [jɛ].[4] Vowels can also be nasalized (e.g., <ą> [ą]).

(9) **Southern Tutchone vowel inventory**

	Front	**Central**	**Back**
High	i <i>	ɨ <ü>	u <u>
Mid	e <e>	ə ~ ɛ <ä>	(o) <o>
Low		a <a>	

The realization of <ä> [ə ~ ɛ] differs between dialects and morphological domains (outlined in 2.1). In Kluane, prefix <ä> varies between [ə ~ ɛ], but stem <ä> is always [ə]. In Lake Laberge, <ä> is usually [ɛ] in all domains. For consistency, all instances of <ä> are transcribed in IPA as [ə] unless specifically highlighting the fronting of <ä> (i.e., in 5.1).

The phonemic status of the simple vowels is addressed in Chapter 3, and the complex vowels (diphthongs and rhotacized vowels) are addressed in Chapter 5. <o> is underrepresented in Southern Tutchone, as it is in many other Northern Dene languages (see, e.g., Lovick, 2020, p. 62 on Upper Tanana; Rice, 1989, p. 80 on Slave). I have found no noun stems in Southern Tutchone that contain the vowel <o>, so I do not address the vowel further in this work.

[3] I briefly discuss potential additional phonemes, including palatals, in 6.2.
[4] Vowel length (not represented in (9)) is addressed in 3.2. The relationship between vowel length and morphological domain is discussed in 2.1.

1.5.3 Tone

Southern Tutchone is a tonal language, with both lexical and grammatical tone. Examples of high, low, falling and rising lexical tones are given in (10). In the orthography, high tones are unmarked (V) and low tones are marked with a grave accent (V̀); falling tones have a macron (V̄), while rising tones have an acute accent (V́).

(10) **Lexical tone examples**

High	*tth'än*	[tθ'ən]	'bone'
Low	*łù*	[łù:]	'whitefish'
Falling	*khų̄*	[xų̂:]	'raft'
Rising	*gá*	[kă:]	'rabbit'

The historic source of tone and the status of rising tone are both discussed in 4.2. There are many minimal pairs for high and low tone, as in (11).

(11) **Tone minimal pairs**

a.	*ya*	[ja:]	'spirit power'
	yà	[jà:]	'louse'
b.	*tthe*	[tθʰe:]	'rock'
	tthè	[tθʰè:]	'Chum salmon'

However, this is not the case for contour tones: Lexical falling tones are rare, since they are formed from a historical sequence of high and low tone syllables (Ritter, 1982). Rising tones are difficult to distinguish from high tone, since the rise in pitch is "almost imperceptible" (Tlen, 1993, p. 74); but, high and rising tones contrast in several possessive prefixes (e.g., *a̋-* 'my' and *ä-* 'something's'), which are introduced in 2.1. I address the status of rising tones in 4.2.

Southern Tutchone additionally has grammatical tone, which manifests in the nominal domain in possession. High and rising tone nouns become falling when possessed (12), while low and falling tone nouns are unchanged (in terms of tone) (13).

(12) **Possession tone alternations**

a.	*chu*	[tʃʰu:]	'water'
	-chū	[tʃʰû:]	'water' (possessed)
b.	*łú*	[łŭ:]	'fish
	-lū	[lû:]	'fish' (possessed)

(13) **Non-alternating possessed nouns**

a.	*łù*	[ɬù:]	‘whitefish’
	-lù	[lù:]	‘whitefish’ (possessed)
b.	*khų̄*	[xų̂:]	‘raft’
	-ghų̄	[ɣų̂:]	‘raft’ (possessed)

As discussed in 2.1, I analyze this change as involving suffixation of a possessive morpheme, which contains tone but no segmental content, notated as /Ò/. This is shown in (14).

(14) *-chū* /tʃu:-Ò/ [tʃʰû:] ‘water’ (possessed)

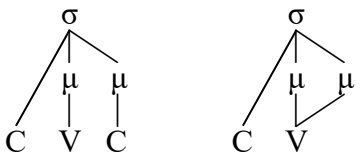
1.6 Theoretical framework

We will see that rhymes are severely constrained in Southern Tutchone. In this thesis, I show that such constraints are best captured by appealing to three central theoretical aspects of phonological representation: syllable structure, the internal structure of segments and licensing. This section introduces the key aspects of each theory for which further motivation is provided throughout the thesis. First, I discuss the motivation for adopting moraic theory as the formal implementation of syllable structure. Second, I motivate the adoption of feature geometry, coupled with underspecification, to account for the behaviour and interaction of segmental features. Third, I introduce positional licensing as a means of capturing asymmetries in the sanctioning of features in different syllabic positions.

In terms of syllable structure, I adopt moraic theory (e.g., Hayes, 1989; Hyman, 1985; McCarthy & Prince, 1996), while continuing to use terms for components of syllables such as onset, nucleus and coda for convenience. Crucially, moraic theory straightforwardly captures the ability of CVC and CV: syllables to pattern together in terms of weight, to the exclusion of CV syllables (15). That is, coda consonants can contribute the same unit of weight to a syllable as does a short vowel (i.e., one mora or μ).

(15) **Syllable weight in moraic theory**

a. Heavy (bimoraic)



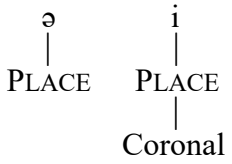
b. Light (monomoraic)

Consistent with these representations, in Southern Tutchone, the minimal word is either CVC or CVː, while *CV is subminimal; that is, words are minimally bimoraic (e.g., McCarthy & Prince, 1999), as discussed in 3.2.

I assume a framework in which features are organized in a hierarchical structure or feature geometry (e.g., Clements, 1985; Sagey, 1986; Uffmann, 2011). Feature geometry was motivated to capture the finding that features pattern together in groups. A particularly important constituent in this thesis will be PLACE, so this section focuses on the representation of place of articulation in Southern Tutchone. Feature geometric representations consist of two primitives: features, which have phonetic content (e.g., Coronal), and organizing nodes (e.g., PLACE), which do not.

As a result, both nodes and features can be contrastive: First, the laryngeal consonants (such as [ʔ]) lack a PLACE node, since they are not articulated in the oral cavity. Second, segments with an oral cavity constriction but without a place target (such as [ə]) have a PLACE node with no dependent features. Third, segments with a place target (such as [i]) have a Place node with a dependent feature (Labial, Coronal or Dorsal). These three representations on the place dimension are shown in (16).

(16)



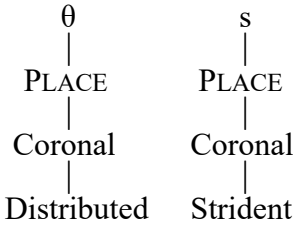
I also adopt Constrastive Underspecification, in which only contrastive features are specified underlyingly (e.g., Avery & Rice, 1989; Dresher, 2009; Mester & Itô, 1989; Steriade, 1987). For example, central vowels are articulator-less, so have bare PLACE. However, bare PLACE is interpreted as coronal (specifically, anterior coronal) in consonants, since these segments behave as default within the oral cavity, and are thus unmarked (see, e.g., Avery & Rice, 1989). That is, in terms of place features [t, ʔ] are differentiated only by the presence or absence of PLACE (17).

(17) **Bare PLACE as coronal**

Coronal consonants only have the feature Coronal when it has a dependent feature, such as Strident or Distributed (e.g., Shaw, 1991). For example, [θ, s] are both coronal fricatives, so they minimally contrast for place. Dental consonants like [θ] have the feature Distributed, which is a

dependent of Coronal, while strident consonants like [s] have Strident. Therefore, unlike [t] in (17), [θ, s] have the feature Coronal (18).

(18) **Dependent features of Coronal**



Asymmetries between the two classes of coronals (those with and without Coronal) are relevant in the ability of a consonant to occur in coda position: coronal consonants with the feature Coronal pattern with Labial and Dorsal consonants in being prohibited as codas, but coronals with bare PLACE are permitted in coda position.

In addition, the representation of both central vowels and unmarked coronals as having bare PLACE is relevant in the licensing of coda PLACE, as I propose that central vowels are able to share their PLACE node with coda consonants (discussed below). The representation of vowels is analyzed in 3.3, with a summary of representations presented in 3.4. The features of coda consonants are discussed in Chapter 4, particularly as they relate to positional asymmetries (onset vs. coda, nucleus vs. coda).

To address asymmetries in the ability of segments to occupy different syllabic positions, I appeal to prosodic licensing (e.g., Cho, 1990; Goldsmith, 1990; Harris, 1997; Itô, 1986). That is, syllabic positions (such as onset, nucleus and coda) differ in their ability to license contrast, formally implemented as the ability to license particular nodes and features. Focusing on place features, Southern Tutchone contrasts all places of articulation in onset position. As is common crosslinguistically, labial and dorsal consonants are excluded from coda position, but so, too, are certain coronals: All coronal stops and affricates are well-formed onsets, including coronals with bare PLACE (like [t^h]) and those with Coronal in addition to a dependent feature (like Strident for [ts] and Distributed for [tθ]) (19). On the other hand, the only coda stop is [t^h], which lacks the feature Coronal (20).

(19) **Onset coronal stops and affricates**

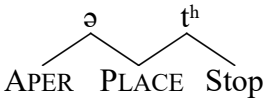
tän	[tʰən]	'trail'
tsäl	[tsʰəl]	'ground squirrel, gopher'
ttha	[tθʰaː]	'sand, gravel'

(20) **Coda coronal stops and affricates**

łät	[ɬətʰ]	'smoke'
	*CVtsʰ	
	*CVtθʰ	

Therefore, coda position appears to license bare PLACE but no other place features. However, as is shown in 4.3, coda position cannot even license bare PLACE (21). Evidence for this comes from the fact that nuclei followed by codas must be central (bare PLACE). This suggests that coda PLACE is licensed parasitically; that is, it is licensed by the nucleus and shared with the coda (22).

(21) **Coda place licensing (simplified):** Codas cannot license PLACE.

(22) 

A full analysis of coda place licensing is presented in 4.2, 4.3 and 5.1. The licensing of manner and laryngeal features is addressed in 4.1.

1.7 Organization of thesis

This thesis is organized as follows: Chapter 2 introduces the noun in Southern Tutchone, discussing the differing constraints of the noun stem in comparison with that of bound morphology (2.1) and providing a summary of possible stem rhyme shapes (2.2). Chapter 3 provides an analysis of the vowel system, including a discussion of the traditional reduced-full distinction (3.1), an account of phonemic vowel length (3.2) and a proposed geometry of vowel place (3.3). Chapter 4 addresses the features of consonants, with a focus on coda consonants, including laryngeal and manner features (4.1), as well as place features (4.2). 4.3 provides an analysis of coda place licensing, highlighting the importance of examining both vowels and consonants together in order to understand the interaction of the geometry of place and licensing. Chapter 5 examines potential challenges from complex vowels: namely, diphthongs (5.1) and

rhotacized vowels (5.2), which will lead to a revised view of coda place licensing. I conclude in Chapter 6, discussing implications of the analysis (6.1) and directions for future work (6.2).

Chapter 2: The Southern Tutchone noun

In Dene languages, nouns and verbs, the main lexical categories, respect different phonological constraints (e.g., Hargus, 2010).[5] From morphological and phonological perspectives, Southern Tutchone nouns permit less complexity than verbs (e.g., Tlen, 2007a; Tlen, 2007c). This pattern is common across the language family (e.g., Kari, 1985; Rice & de Reuse, 2017).

This thesis investigates the phonological constraints that hold of nouns, focusing on the noun stem. This chapter first outlines the domains of the noun in 2.1, since bound morphology and stems respect different constraints. I then provide an overview of possible noun stem shapes in 2.2, highlighting the generalizations that the analysis in the rest of this work addresses.

2.1 Domains

The noun has three distinct morphological domains, which respect different phonological constraints: prefix, stem and suffix. The domains are shown in (23).[6]

(23) **Morphological domains of the Southern Tutchone noun**

Domain	(prefix)	stem	(suffix)
Shape	CV, V, N	CVː, CVC, CVːC	V, tonal

Nominal prefixes are limited to those used in possession. In contrast with stems, rhymes in all prefixes are monopositional: they contain short vowels or syllabic nasals, and codas are not permitted.[7] In affixes, all vowels are short, including [i, a, u] which are always long in stems. I assume that underlying long vowels are shortened in affixes due to morphological and prosodic position. The possessive prefixes for the Lake Laberge and Kluane dialects are shown in (24), with some examples of possessive constructions provided in (25).[8] While two forms are given for some prefixes, subject to inter- and intra-speaker variation, all forms are monopositional.[9,10]

[5] For an alternative view regarding the status of phonological distinctions between nouns and verbs in distantly related Tlingit, see Crippen et al. (2023).
[6] The morphological domains in (23) may correspond to prosodic domains, but a full prosodic analysis is outside the scope of the current work. For some discussion of morphological–prosodic correspondence, see 3.2.
[7] As mentioned in 1.5.3, some possessive prefixes form high-rising tone minimal pairs.
[8] An additional third person singular prefix *ma-* is attested in YNLC (2010, p. 48).
[9] With *kwä-* [kʰʷə] and *ku-* [kʰu], the choice of prefix appears to be at least partly phonologically conditioned, with the *ku-* form occurring more frequently before stems containing [uː]. A similar phenomenon in the fronting of /ə/ is discussed in 5.1.
[10] The plural reflexive prefix *kädä-* appears to be bimorphemic, consisting of a plural prefix *kä-* and the singular reflexive prefix *dä-*.

(24) **Southern Tutchone possessive prefixes**

a. Singular

ä́-	[ʔə̌]	‘my’ (1SG)
n-, *ni-*	[n̩], [ni]	‘your’ (2SG)
u-	[ʔu]	‘his/hers/its’ (3SG)
dä-	[tə]	‘his/her/its own’ (3SG.REFL)

b. Plural

dä́-, *dá-*	[tə̌] [tă]	‘our/your’ (1PL/2PL)
kwä-, *ku-*	[kʰʷə], [kʰu]	‘their’ (3PL)
kädä-	[kʰətə]	‘their own’ (3PL.REFL)

c. Other

ä-	[ʔə]	‘something/someone’s’ (UNSP)
kwä-, *ku-*	[kʰʷə], [kʰu]	‘an area’s’ (AREA)

(25) **Southern Tutchone possessive constructions**

a.	*-mbat*	[ᵐbaːtʰ]	‘older sister’
	umbat	[ʔuᵐbaːtʰ]	‘his/her older sister’
b.	*thü*	[θɨː]	‘pants’
	kwädhū̃	[kʰʷəðɨ̂ː]	‘their pants’
c.	*łú*	[łŭː]	‘fish’
	nlū	[n̩lûː]	‘your fish’

Noun stems are a closed class of monosyllabic forms.[11] Other nouns are formed through possession and compounding, and many through nominalization of verbs.[12,13] I define the noun stem as the nominal root excluding affixes. Unlike prefixes, rhymes in stems are minimally bipositional: they consist of open syllables with long vowels (26) or diphthongs (27), or closed syllables (with either long or short vowels) (28).

[11] There are some bisyllabic stems which include frozen historical prefixes, but I do not address such forms in this thesis.

[12] I do not discuss nominalizations or directionals, both of which follow the phonological constraints of verbs. Rice (1989, pp. 170–183) provides a detailed discussion of nominalizations in Slave (Northern Dene). Kari (1985) discusses directionals in general, while Moore and Tlen (2007) address the use of directionals in Southern Tutchone.

[13] The term *compound* refers to constructions that use iterative possessive morphology (e.g., Rice, 1985), as in (38) below.

(26) *chu*	[tʃʰuː]	‘water’	
the	[θeː]	‘belt’	
	*Cɛ, *Cə		
(27) *tläw*	[tɬʰəw]	‘berry pulp’	
khäy	[xəj]	‘root’	
(28) *tthël*	[tθʰɛl]	‘fence’	
män	[mən]	‘lake’	
xal	[xaːl]	‘sled’	

Stems and prefixes differ not only in permitted rhyme shapes, but also in the presence or absence of the processes that identify them. For example, the stem is the target of nasal fortition, a process which strengthens stem-initial nasals when there is no following vowel nasalization or nasal coda, previously discussed in 1.5.1. In (29), [m] is followed by a nasalized vowel and [n] by a nasal coda, so both are realized as plain nasals. In (30), however, the nasal onsets are not followed by either type of nasality, so they are realized as prenasalized stops. I include the underlying representations to demonstrate that both prenasalized stops and plain nasals are allophones of the nasal phonemes /n, m/, in contrast to how they are orthographically represented.

(29) *-mą*	/maːn/	[mąː]	*[ᵐbąː]	‘mother’
nän	/nən/	[nən]	*[ⁿdən]	‘you’
(30) *-mbat*	/maːt/	[ᵐbaːtʰ]	*[maːtʰ]	‘older sister’
nda	/naː/	[ⁿdaː]	*[naː]	‘medicine’

The target of nasal fortition is the left edge of the stem and not the left edge of the word, since it affects the stem even when it is preceded by a possessive prefix (31) and does not target nasal prefixes like *ni* (32).

(31) *umbat*	/u-maːt/	[ʔuᵐbaːtʰ]	*[ʔumaːtʰ]	‘his/her older sister’
(32) *nindâ*	/ni-naː-Ȍ/	[niⁿdâː]	*[ⁿdinâː]	‘our medicine’

As shown in the table in (23), Southern Tutchone also has nominal suffixes, which are V or tonal in shape. The only V-shaped suffix is *-a*, which has two main meanings: as a diminutive,

marking smallness or endearment (33); as a suffix on most kinship terms (34).[14] The suffix yields vowels in hiatus which are not permitted elsewhere. This may indicate that the suffix is in a different prosodic domain from the stem, which I leave to future work.

(33) **Diminutive suffix *-a***

a.	*khal*	[xaːl]	‘sled’
	khala	[xaːla]	‘small/cute sled’
b.	*tlį*	[tɬʰįː]	‘dog’
	tlįa	[tɬįːa]	‘puppy/small dog’ (also *tlįą*)

(34) **Kinship suffix *-a***

a.	*-tsų*	[tsʰųː]	‘grandmother’ (less common)
	-tsųa	[tsʰųːa]	‘grandmother’ (more common; also *-tsųą*)
b.	*-tsì*	[tsʰ̀iː]	‘grandfather’ (less common)
	-tsìa	[tsʰ̀iːa]	‘grandfather’ (more common)

In addition, the same vowel is epenthesized at the right edge of many loanwords, especially those with coda consonants that violate Southern Tutchone phonotactics (35).

(35) **Epenthetic <a> in loanwords**

dusha	[tuːʃa]	‘cat’ (Lake Laberge), from Tlingit *dóosh*
kaeda	[kʰæːta]	‘cat’ (Kluane), from English *cat*

Speakers commonly identify all uses of a final *-a* as the diminutive.[15] Crosslinguistically, /a/ is not a common epenthetic vowel due to its high sonority; this may explain why speakers identify <a> in loanwords as the diminutive.

Southern Tutchone also has a tonal possessive suffix with two forms, with the data in (36) showing that possessive constructions consist of a possessive prefix, the noun stem, and the tonal suffix. The tonal possessed noun suffix (see Saxon & Wilhelm, 2016) most commonly results in a high tone stem being produced with a falling tone.[16] This form of the suffix is seen with all alienable (optionally possessed) nouns.

[14] Leer (2005, p. 306) notes that “forms with the diminutive suffix *-a* are more common in Northern and Southern Tutchone” for certain kinship terms. The (non-cognate) diminutive suffix is found in Tlingit in vocative forms of kinship terms and is always present on some terms including *léelk’w* ‘grandparent’ (Crippen, 2010, p. 12).
[15] Southern Tutchone does not mark plurality on nouns. Exceptionally, the diminutive *dunèna* ‘(little) children’ from *dunèn* ‘child’ has a plural interpretation (Tlen, 1993, p. 40).
[16] High tone is not marked in transcriptions, as noted in 1.4.

(36) **Alienable possession**

a.	*shür*	[ʃɨ̆ː]	‘inconnu (type of fish)’
	-shūr	[ʃɨ̂ː]	‘inconnu’ (possessed)
	ushūr	[ʔuʃɨ̂ː]	‘his/her inconnu’
b.	*njі*	[ⁿdʒiː]	‘food’
	-njī	[ⁿdʒîː]	‘food’ (possessed)
	kwänjī	[kʰʷəⁿdʒîː]	‘our food’

With inalienable (obligatorily possessed) nouns, a more common pattern is for the stem to have a low tone (37).

(37) **Inalienable possession**

a.	*-là*	[làː]	‘hand’
	ǻlà	[ə̌làː]	‘my hand’
b.	*-kè*	[kʰèː]	‘foot’
	ukè	[ʔukʰèː]	‘his/her foot’

Determining the tonality of the underlying (unpossessed) form of inalienable noun stems requires reference to other constructions, since the unpossessed form is ungrammatical in isolation. However, the unpossessed form can appear in compounds and noun incorporation (38), since inalienable nouns in these contexts exceptionally do not require a possessor (Saxon & Wilhelm, 2016, p. 44).[17]

(38) **Bare inalienable nouns in compounds**

a.	**ła*	[ɬaː]	intended: ‘hand’ (unpossessed)
	***-la** t’äy*	[laː t’əj]	‘back of hand’ (lit. hand’s back)
b.	**ke*	[kʰeː]	intended: ‘foot’ (unpossessed)
	***-ke** gān*	[kʰeː kə̂n]	‘toenail’ (lit. toe’s nail)

Taken together, the data in (37) and (38) show that the low tone is a possessive suffix rather than part of the stem.

In summary, there are three domains in the Southern Tutchone noun: prefix, stem and suffix. Prefixes and suffixes are by definition bound and are maximally monopositional, with no long

[17] The noun *t’äy* [t’əj] has no tonal suffix. There are multiple inalienable nouns with no apparent suffix, which I assume are relational nouns (i.e., they have an inherent argument position). For an alternative view in related languages, see Saxon and Wilhelm (2016).

vowels or codas permitted. On the other hand, stems (roots excluding affixes) can occur as words by themselves; in addition, they are bipositional and can include long vowels and/or codas.

2.2 Stem rhyme shapes

As shown in the previous section, the noun stem allows for more segmental complexity than either prefixes or suffixes. This section gives an overview of the possible rhyme shapes in noun stems, with the following chapters providing an analysis; specifically, Chapter 3 provides an analysis of vowels and Chapter 4 provides an analysis of coda consonants. Descriptions of Southern Tutchone (e.g., McClellan, 1981, p. 493; Ritter, 1976) give the orthographic vowels for monophthongs in (39), presented in the YNLC orthography, in addition to two falling diphthongs <äy, äw> and two rhotacized vowels <ür, är>. The orthographic vowels are broadly phonemic, reflecting three heights and three degrees of backness.

(39) **Southern Tutchone vowels (provisional)**

	Front	**Central**	**Back**
High	<i>	<ü>	<u>
Mid	<e>	<ä>	<o>
Low		<a>	

As discussed in 1.4, I generally adopt the YNLC orthography, with the exception of adding <ë> for the rising diphthong [jɛ], whose status is further discussed in 5.1.[18]

A summary of possible rhyme shapes in stems is shown in (40). Rows are organized by vowel quality and columns by coda consonant and nasalization. Nasalization is represented as a column, since nasalized vowels will be argued to be underlyingly a sequence of a vowel and a nasal in 3.2. Rhotacized vowels are represented as a row, since rhotacization will be argued to be an underlying feature of vowels rather than reflecting two separate segments (i.e., a vowel and a rhotic consonant) in 5.2.[19] Cells in grey with a cross are systematically excluded as possible forms, while those that are unshaded with no marking are unavailable due to the historical development of <ü> [iː], which obtained its vowel quality from eroded codas (Ritter, 1976).[20] I do not address <o>, due to it being absent from noun stems, as discussed in 1.5.2.

Three significant patterns emerge from the table: all vowels except <ë, ä> [jɛ, ə]), including diphthongs and rhotacized vowels, can appear in an open syllable (CVː or CɣːV) stem; coda <l, t>

[18] <ë> is used in Tlen (1993) to refer to fronted productions of <ä> (i.e., [ɛ]), for which I uniformly use <ä>.
[19] Similarly, the offglide of diphthongs will also be argued to be within the nucleus rather than a coda in 5.1.
[20] <ü> is written as ʉ in Ritter's work.

[l, tʰ] can follow <ë, ä, a> [jɛ, ə, aː] but not any other vowel; and coda <n> [n] can only follow <ë, ä> [jɛ, ə].[21] In addition, all codas are coronal. The table in (40) with example stems for each cell is included as Appendix 2.[22]

(40) **Stem shapes in Southern Tutchone**

Ortho.	IPA	CVː	CV̨ː	CVn	CV(ː)l	CV(ː)tʰ
<i>	[iː]	✓	✓	×	×	×
<u>	[uː]	✓	✓	×	×	×
<e>	[eː]	✓	✓	×	×	×
<a>	[aː]	✓	✓	×	✓	✓
<ü>	[ɨː]	✓		×		
<ë>	[jɛ]	×	×	✓	✓	✓
<ä>	[ə]	×	×	✓	✓	✓
<äy>	[əj]	✓	✓	×	×	×
<äw>	[əw]	✓	✓	×	×	×
<ür>	[ɨ˞ː]	✓	✓	×	×	×
<är>	[ə˞ː]	✓	✓	×	×	×

The production of <ë> is usually [jɛ], with [ɛ] being a common variant and [jə] a rare variant. Since <ë> patterns identically to <ä>, I set <ë> aside in the following analysis, before returning to its representation (and its variable production) in 5.1.

Due to significant contact and community-level bilingualism (McClellan, 1981; Ned, 2001), Southern Tutchone has some Tlingit loanwords that retain Tlingit-like segmental complexity (i.e., they are not repaired through epenthesis as in 2.1), such as *k'úk* 'paper, book', from Tlingit *x'úx* (Edwards, 2009, p. 292). I do not address these forms further, nor do I address English loanwords.

The following chapters provide an analysis of the patterns described in this section. In Chapter 3, I analyze the vowel system; I propose that underlying length and featural distinctions provide an explanation for asymmetries between the distribution of <ë, ä> [ɛ, ə] and the other vowels. In Chapter 4, I analyze coda consonants and their interactions with vowels, proposing that codas are limited in terms of place and laryngeal features. In Chapter 5, I address diphthongs

[21] There is a small set of noun stems with the shape Cạːn which are all inalienably (obligatorily) possessed, including *-gàn* [kạːn] 'arm'. I do not address such stems in this thesis, but I posit that the realization of the nasal coda after a long nasalized vowel is linked to the underlying representation of the possessive suffix. I leave such an analysis for future work.

[22] Aspiration of final <t> [tʰ] is addressed in 4.1.

and rhotacized vowels, showing that their distribution follows from their representations provided in Chapter 3.

Chapter 3: Vowels

This chapter addresses vowel quality and quantity, as well as natural classes of vowels in Southern Tutchone. I first provide the distribution of vowels in different environments, followed by a discussion of the traditional reduced-full distinction as it is encoded in the orthography in 3.1, showing it not to correspond to natural classes in (present day) Southern Tutchone. In 3.2, I examine vowel length, proposing an underlying length distinction; then, in 3.3, I discuss vowel place (as well as vowel height). Finally, in 3.4, I give representations for the major vowel phonemes of Southern Tutchone.

I examine vowels in noun stems with respect to three distributional patterns: open syllable oral stems, open syllable nasalized stems and closed syllable stems. With regard to open syllable oral stems, any monophthong except for <ä> [ə] can form the nucleus (41), as can a diphthong or rhotacized vowel (42).[23]

(41) **Open syllable oral stems (monophthongs)**

nji	[ⁿdʒiː]	‘food’
chu	[tʃʰuː]	‘water’
the	[θeː]	‘belt’
nda	[ⁿdaː]	‘medicine’
thü	[θɨː]	‘pants’

(42) **Open syllable oral stems (diphthongs and rhotacized vowels)**

khäy	[xəj]	‘root’
ch’äw	[tʃˀəw]	‘quill’
shür	[ʃɨˠː]	‘inconnu’
shär	[ʃəˠː]	‘bear’

The same pattern occurs in nasalized stems, where any monophthong except for <ä> [ə] can be nasalized (43), as can any diphthong or rhotacized vowel (19).[24]

[23] As mentioned in 2.2, I have not found stems containing <o>, but the following analysis does not exclude them from open syllable stems.

[24] The two variants of ‘aunt (same clan)’ are both given due to nasalized <ę> [ęː] and <ą̈y> [ə̨j] both being underrepresented. The lack of nasalized <ų̈> [ɨ̨ː] is addressed in 2.2.

(43) **Open syllable nasalized stems (monophthongs)**

tth'į	[tθ'į̃ː]	'mosquito'
-tsų	[tsʰų̃ː]	'grandmother'
-mę	[mę̃ː]	'aunt (same clan)'
shą	[ʃã̃ː]	'rain'

(44) **Open syllable nasalized stems (diphthongs and rhotacized)**

-mäy	[mə̨j]	'aunt (same clan)'
gäw	[kə̨w]	'drum'
łür	[ɬɨ̯˞ː]	'dwarf birch'
tl'är	[tɬ'ə̨˞ː]	'horsefly'

Regarding the ability to precede a coda consonant, there are two patterns: a nasal coda can follow only <ä> [ə] (45), meaning that vowel nasalization (43) is in complementary distribution with nasal codas, while other codas can follow <ä, a> [ə, aː] (46).

(45) **Closed syllable stems (nasal codas)**

män	[mən]	'lake'
shän	[ʃən]	'me'

(46) **Closed syllable stems (non-nasal codas)**

khal	[xaːl]	'sled'
łat	[ɬaːtʰ]	'box'
łät	[ɬətʰ]	'smoke'

This chapter addresses three key puzzles concerning the representation of vowels in Southern Tutchone: the exclusion of <ä> [ə] from open syllable stems, the distribution of coda nasals and nasalization, and the fact that only <ä, a> [ə, aː] can precede codas. A summary of the relevant patterns among vowels is shown in (47).

(47) **Vowel distribution by syllable type**

Vowel	**CV**ː	**CṾ**ː	**CVn**	**CV(ː)l, CV(ː)tʰ**
<a> [aː]	✓	✓	×	✓
<ä> [ə]	×	×	✓	✓
others	✓	✓	×	×

3.1 The reduced-full distinction

The patterns introduced above clearly concern both vowel quality and quantity. Therefore, I first address the reduced-full distinction, which is a reconstructed quality and quantity distinction between short, central reduced vowels and long, peripheral full vowels in Proto-Dene (Krauss, 1964). In Krauss's reconstruction, each full vowel corresponds to a reduced vowel with which it alternates in certain paradigms (both *iː and *eː correspond to *ə); see (48).[25]

(48) **Proto-Dene vowel inventory**

Full	Reduced		Full
*iː		*ʊ	*uː
	*ə	*ɑ	
*eː			*ɑː

In most contemporary Dene languages that retain a distinction between reduced and full vowels, alternations between historically corresponding vowels no longer occur (Cook, 1981, p. 265). The mapping of the distinction to daughter languages is complex, with some retaining the contrast through length and/or quality, and others not retaining it at all (Rice & de Reuse, 2017).

Turning to Southern Tutchone, I start by examining the orthographic encoding of reduced and full vowels. Dene languages of Alaska and the Yukon are written in a standard orthography combining elements of English orthography and Americanist phonetic notation (Ryan & Robinson, 1990). Reduced vowels are usually represented with an umlaut (Manker, 2012, p. 10), suggesting that Southern Tutchone has two reduced vowels: <ü, ä> [ɨː, ə].[26]

In Southern Tutchone, the orthographic reduced vowels, however, do not pattern together. In terms of stems, only <ü> [ɨː] can form an open syllable stem, while the other reduced vowel <ä> [ə] cannot (49).

(49) **Orthographic reduced vowels in open syllables**

t'ü	[tʼɨː]	'poplar'
mbü	[ᵐbɨː]	'bank, bluff'
	*Cə	

In addition, the reduced-full distinction does not align with the ability of a vowel to precede a coda. While reduced <ä> [ə] can have a coda (50), so can full <a> [aː] (51).

[25] References to Proto-Dene reconstructions refer primarily to Leer (2005), which synthesizes and builds on earlier work (e.g., Krauss, 1964; Leer, 1979; Rice, 1997).
[26] Three including the addition of <ë>.

(50)	*-shäl*	[ʃəl]	‘younger brother’
	-mbät	[ᵐbətʰ]	‘front’
(51)	*-shal*	[ʃaːl]	‘fish tail’
	-mbat	[ᵐbaːtʰ]	‘older sister’

Therefore, from the data discussed in this section, it appears that the orthographic distinction between reduced and full vowels is not, or at least is no longer, reflected in the phonology of Southern Tutchone. Therefore, I set the historical distinction and orthography aside, examining the quantity (3.2) and quality (3.3) of vowels independently.

3.2 Vowel length

As discussed earlier, *Cə is not a possible stem shape, while an open syllable stem with any other vowel is. In addition, all open syllable stems have a long vowel, including those with the orthographic reduced vowel <ü> [ɨː] (52).

(52) **Long vowels in open syllables**

dì	[tìː]	*[tì]	‘tea’
mbü	[ᵐbɨː]	*[ᵐbɨ]	‘bank, bluff’
sha	[ʃaː]	*[ʃa]	‘sun’

The question is then why [ə] is excluded from open syllable stems. In the framework of Moraic Theory (e.g., Hayes, 1989; Hyman, 1985; McCarthy & Prince, 1996), I propose that Southern Tutchone has an underlying length distinction, where /ə/ is monomoraic (short) and all other vowels are bimoraic (long). [27] To illustrate, moraic representations for /ə/ and /aː/ are given in (53).

(53) **Underlying length in moras**

Stems shaped *Cə and *Cəː are ill-formed. Concerning *Cəː, the lengthening of /ə/ is excluded due to its impoverished featural representation, as is discussed in 3.3. Because all stems are monosyllabic, the exclusion of *Cə as an open syllable stem is a consequence of word minimality requiring noun stems to form a bimoraic foot (e.g., McCarthy & Prince, 1999). The

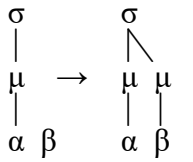
[27] Weightless /ə/ is excluded (cf. Kager, 1989) as an option, since /ə/ must contribute a mora to form the minimal stem.

examples in (54), where /ə/ is followed by a coda, are well-formed because an additional mora is assigned to the coda consonant through Weight by Position (Hayes, 1989), as defined in (55).

(54) **Word minimality and /ə/**

män	/mən/	[mən]	‘lake’
łät	/łət/	[łətʰ]	‘smoke’
dzäl	/tsəl/	[tsəl]	‘ball’
	*Cə, *Cəː		

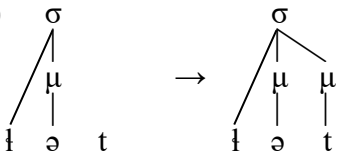
(55) **Weight by Position** (Hayes, 1989, p. 258)



where σ dominates only μ

For example, the process of coda /t/ acquiring a mora when it follows /ə/ is shown in the derivation in (56).

(56)



While /ə/ requires a moraic coda to satisfy word minimality, /aː/ does not. In addition, /aː/ does not shorten before a coda (57), remaining long as it is in open syllables (58).[28]

(57) **/aː/ in closed syllables**

khal	/xaːɬ/	[xaːl]	*[xal]	‘sled’
-mbat	/maːt/	[ᵐbaːtʰ]	*[ᵐbatʰ]	‘older sister’

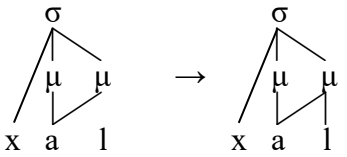
(58) **/aː/ in open syllables**

nda	/naː/	[ⁿdaː]	‘medicine’

The lack of shortening is unexpected (cf. Myers, 1987 for English), since the sequence of a long vowel followed by a coda is crosslinguistically marked (e.g., Harris, 1994). Instead, a VːC rhyme is formed, suggesting that the second mora of the vowel is shared with the coda consonant (e.g., Broselow et al., 1995; Hayes, 1989) (59).

[28] The voicing of coda /ɬ/ is addressed in 4.1.

(59) **Mora sharing in Southern Tutchone**



As per the definition of Weight by Position in (55), the coda [l] in (59) does not project an additional (third) mora since the syllable already dominates the two moras of /aː/.

Additional asymmetries between /ə/ and other vowels in the realization of final nasals can be attributed to a difference in length. Long vowels become nasalized before an underlying nasal, which then deletes (60), while short /ə/ is realized with a nasal coda (61).

(60) **Nasalization of long vowels**

shą	/ʃaːn/	[ʃąː]	‘rain’
tlį	/tɬʰiːn/	[tɬʰįː]	‘dog’

(61) **Nasal coda with short /ə/**

män	/mən/	[mən]	‘lake’

I propose that vowel nasalization is the default realization of underlying post-vocalic nasals, relating to the resistance of the phonology of Southern Tutchone to coda consonants discussed in Chapter 4, with nasal codas as in (61) being the exception driven by word minimality. /ə/ cannot be lengthened, as discussed in 3.3, prohibiting the case where a /ən/ rhyme is realized as *[ə̨ː]. In addition, nasalized /ə/ as short *[ə̨] would yield subminimal stems. Instead, the underlying nasal is produced as coda [n], being assigned a crucial second mora to give a bimoraic stem. With all other vowels, as in (60), the nasal is realized as nasalization of the underlyingly long vowel.

While /ə/ is not nasalized like long vowels are when followed by an underlying nasal, it can be nasalized in certain dialectal productions from the Kluane dialect when it has a non-nasal coda (62).

(62) **Nasalization of əC rhymes in Kluane**

shän	[ʃən]	‘young woman’ (common)
shą̈l	[ʃə̨l]	‘young woman’ (Kluane dialectal)

That is, əC rhymes have the same distribution as long vowels, providing additional evidence that /ə/ alone is monomoraic but forms a bimoraic rhyme when followed by a coda. The realization of post-vocalic consonants is only conditioned by length for nasals (and not for /l, t/), since only nasals are recoverable; that is, only nasality (lowering of the velum) can be imposed on a vowel

(see, e.g., Rice & Avery, 1989). In addition, (62) provides further evidence for this point in that the Kluane production preserves the lateral, with the nasal consonant deleting and being realized as nasalization.

3.3 Vowel place

The preceding section shows that vowel length and the presence of a coda are linked, since coda consonants provide a second mora to stems containing /ə/. However, both short /ə/ and long /aː/ can precede a coda, while the other long vowels cannot. I propose that the distinction between /ə, aː/ and other vowels lies in their place features: central vowels can precede codas, but non-central vowels cannot. As stated in 2.2, while /ɨː/, which is also a central vowel, does not precede codas, this is due to its historical development. I adopt an analysis of central vowels as placeless (e.g., Clements, 1991; Goad, 1993; van der Hulst, 2018; Rice, 1995), but the particularities of vowel place require discussion of the internal structure of segments.

I assume a framework in which features are organized in a hierarchical structure or feature geometry (e.g., Clements, 1985; Sagey, 1986; Uffmann, 2011). I also adopt Constrastive Underspecification, in which only contrastive features are specified underlyingly (e.g., Avery & Rice, 1989; Dresher, 2009; Mester & Itô, 1989; Steriade, 1987), with all features being monovalent (e.g., Cho, 1990; van der Hulst, 2016; Lombardi, 1991; Mester & Itô, 1989). These two assumptions together are able to capture the asymmetries in phonological behaviour in vowels, as well as coda consonants and the interaction of vowels and consonants (Chapter 4).

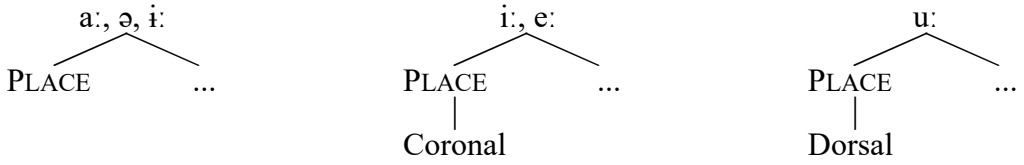
In feature geometry, there are two types of primitives: features, which have phonetic content, and organizing nodes, which lack phonetic content. In this thesis, features are written with an initial capital letter (e.g., Coronal), and organizing nodes are written in small caps (e.g., PLACE). In my examples, the ROOT node, which dominates all other primitives, is represented by the segment in IPA. As per feature geometry, place features are organized under a PLACE node (see Morén-Duolljá, 2011 for relevant discussion). Segments articulated in the oral cavity have a PLACE node; that is, all vowels (including /ə/) and non-laryngeal consonants have PLACE, but laryngeal consonants do not.[29]

Segments with an articulator under PLACE have a specified target. Therefore, since central vowels are "placeless" (or, more accurately, targetless), they must have a bare PLACE node; that

[29] I return to PLACE in laryngeal consonants in 4.2.

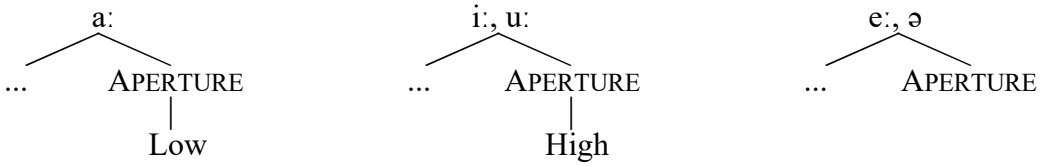
is, they require PLACE, as they are articulated in the oral cavity, but lack dependent features, since they have no place target. As a result, the contrast between central and non-central vowels is expressed as the absence or presence of dependents under PLACE (63). Non-central vowels have features specified under PLACE, such as Coronal for front vowels and Dorsal for back vowels (as per the Unified Articulators approach (Clements & Hume, 1995)).[30,31]

(63) **Place features of central and non-central vowels**



Because Dorsal is defined as back under the Unified Articulators approach, height features are located in an APERTURE constituent independent from PLACE (e.g., Clements, 1991; Goad, 1993; Odden, 1991; Pulleyblank, 2011). As with PLACE in vowels, I define APERTURE as a node present in all vowels. Features specified under APERTURE are targets on the height dimension: low vowels have the feature Low, high vowels have High, and mid vowels have no height target (64).

(64) **Height features of low, high and mid vowels**



In terms of place of articulation and height, there are two relevant dimensions in which vowels can be impoverished: central vowels lacking specification under PLACE and mid vowels lacking specification under APERTURE. Only one vowel, /ə/, lacks a target in both dimensions (see also van Oostendorp, 1995, 2003). I propose that the lack of articulatory targets, represented as the lack of dependent features under PLACE and APERTURE for /ə/, prohibits /ə/ from lengthening.

[30] This approach to PLACE is similar to central and non-central vowels being distinguished by the absence or presence of COLOUR, respectively (Donegan, 1978; van der Hulst, 2018; Padgett, 2002; e.g., Schane, 1984).
[31] Back vowels may have the feature Labial, Dorsal or Peripheral (see Rice, 1995), but a closer examination is left for future work. For now, I take no firm position on their features; the only relevant point is that they have features specified under PLACE.

3.4 Vowel representations

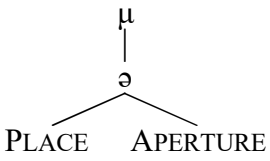
In summary, vowels are distinguished through three dimensions: length, place of articulation, height. In terms of length, /ə/ is short while the other vowels are long; formally, this is expressed as /ə/ being underlyingly monomoraic, while the other vowels are underlyingly bimoraic. In terms of place of articulation, the most relevant distinction is between central and non-central vowels. Central vowels lack specification under PLACE, while front vowels have the feature Coronal and back vowels have Dorsal. In terms of height, high vowels have the feature High under APERTURE, low vowels have Low, and mid vowels have no specification. The feature and length specifications are summarized in (65).

(65) **Feature and length specifications of major vowel phonemes**

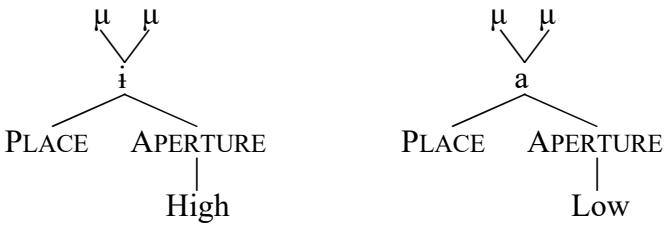
Vowel	**Length**		**PLACE**		**APERTURE**	
	μ	μμ	Coronal	Dorsal	High	Low
/ə/	○					
/ɨː/		○			○	
/aː/		○				○
/iː/		○	○		○	
/eː/		○	○			
/uː/		○		○	○	

Representations for the major vowel phonemes of Southern Tutchone are shown in (66), (67) and (68). Representations for diphthongs (including /jə/) and rhotacized vowels are discussed in Chapter 5.

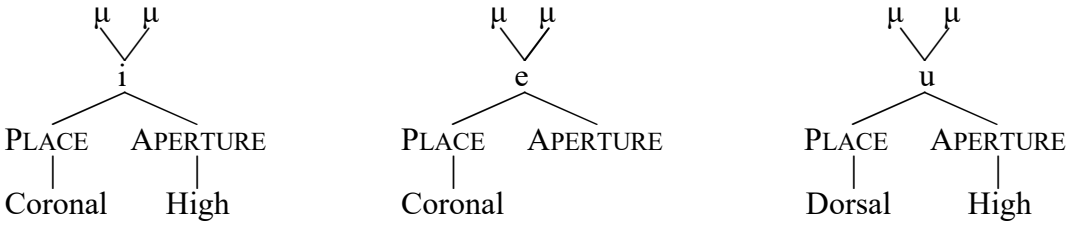
(66) **Short central vowels**



(67) **Long central vowels**



(68) **Long non-central vowels**



Chapter 4: Coda consonants

This chapter addresses the natural classes and featural representations of coda consonants in Southern Tutchone. I first provide the distribution of coda consonants; then, in 4.1, I discuss the non-place features of coda consonants, showing that codas cannot host independent laryngeal features but can host manner features; in 4.2, I address the place features of coda consonants, proposing that coronals in coda position have only a bare PLACE node and no coronal feature; finally, in 4.3, I propose that the coda requires that the nucleus license its place features (specifically, bare PLACE), resulting in codas being limited to placeless coronals and the nucleus in closed syllables being limited to central vowels.

I examine coda consonants primarily in terms of their place of articulation and preceding vowel. There are only three possible coda consonants in Southern Tutchone: [n, l, tʰ].

(69) **[n, l, tʰ] in coda position**

a.	*shän*	[ʃən]	‘me’
		*Caːn	
b.	*mbäl*	[ᵐbəl]	‘sleep’
	khal	[xaːl]	‘sled’
c.	*łät*	[łətʰ]	‘smoke’
	-mbat	[ᵐbaːtʰ]	‘older sister’

While [n, l, tʰ] are all coronals, there are many other coronals that can occur in onset but not coda position, some of which are shown in (70).

(70) **Onset-coda place asymmetries with coronals**

ttha	[tθʰaː]	‘sand, gravel’
	*CVtθʰ	
t’a	[t’aː]	‘plank, board’
	*CVt’	
sha	[ʃaː]	‘sun’
	*CVʃ	

There are also no non-coronal codas, despite many non-coronal consonants occurring in onset position (71).

(71) **Onset-coda place asymmetries with labials and dorsals**

k'a	[k'aː]	'fat'
	*CVk'	
kha	[xaː]	'goose'
	*CVx	
mbà	[^{m}bàː]	'war'
	*CV^{m}b, *CVm	

As discussed in detail in the previous chapter, coda consonants can only follow central vowels.

This chapter addresses three key puzzles concerning the representation of coda consonants in Southern Tutchone: the absence of coronals aside from [n, l, t^{h}] from coda position, the absence of non-coronal consonants from coda position, and the presence of only central vowels preceding codas.

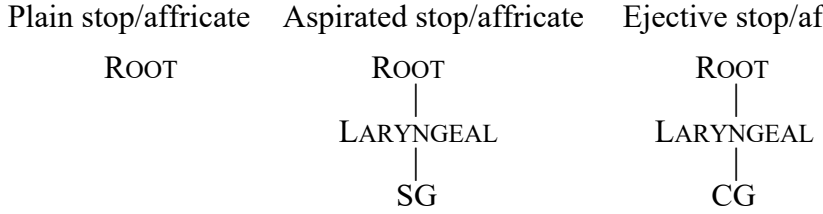
4.1 Laryngeal and manner features in coda

Only a subset of coronal consonants are possible codas in Southern Tutchone, with most coronals, as well as other places of articulation, excluded from this position. This section examines the laryngeal and manner features of possible coda consonants, setting aside place features until 4.2. Since there are three codas with different manners of articulation–a nasal, lateral and stop–manner features do not appear to be constrained in coda position (although, see discussion of affricates below). However, laryngeal features are constrained, since there are no laryngeal contrasts at the right edge.

I analyze constraints on the occurrence of features in coda position within the framework of phonological licensing. Harris (1997) states that licensing "requires of each prosodic or melodic unit in representation that it be bound in some way to some other unit in order to receive phonetic interpretation" (p. 317). In this work, I focus on the licensing of features through association with syllabic positions (e.g., Cho, 1990; Goldsmith, 1990; Harris, 1997; Itô, 1986). Certain syllabic positions are strong licensers (e.g., nuclei), while others are weak licensers (e.g., codas); weak licensing positions are not responsible for the full range of features available to strong licensing positions. Empirical consequences of licensing asymmetries include the neutralization of contrasts in weak licensing positions and the inability for weak licensers to bear some features unless they are licensed parasitically through sharing with a strong licenser.

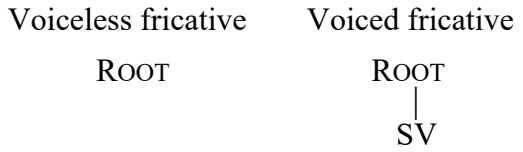
This section addresses the laryngeal and manner features that are licensed by the coda position and those that must be licensed by another position (i.e., the nucleus). In Southern Tutchone, laryngeal contrasts are exhibited in onset position, since the onset is a strong licenser; on the other hand, laryngeal contrasts are neutralized in coda position, as it is a weak licenser. Following Rice (1994), in Dene languages, stops and affricates–on one hand–and fricatives–on the other–differ in their representation of laryngeal contrasts. Stops and affricates have three possible laryngeal specifications: plain stops are unmarked, while aspirated and ejective stops have a LARYNGEAL node, a dependent of the ROOT which dominates the feature Spread Glottis (SG) or Constricted Glottis (CG), respectively (72).[32]

(72) **Laryngeal features of stops and affricates** (after Rice, 1994, p. 115)



Voiceless fricatives are unmarked, and voiced fricatives have the feature Sonorant Voice (SV) (e.g., Piggott, 1992; Rice, 1993; Rice & Avery, 1989), which is not a dependent of LARYNGEAL (73), but rather of the ROOT node. As such, voiced fricatives in Dene languages are "sonorant obstruents" (Rice, 1993). In addition, all fricatives in Southern Tutchone are underlyingly voiceless, with surface voiced fricatives being derived (described below); on the other hand, the laryngeal features of stops and affricates are all specified underlyingly.

(73) **Laryngeal features of fricatives** (after Rice, 1994, p. 115)



The distinction between the two mechanisms of laryngeal/voicing specification is motivated by phonological behaviour and contrast. For example, underlyingly voiceless fricatives become voiced when they are preceded by a sonorant.[33] The process is exemplified by alternations in

[32] While I adopt Rice's representations for coda laryngeal features, I do not exclude the possibility that onset plain stops and affricates have a bare LARYNGEAL node. I leave this issue to future work.

[33] Some dialects simplify some underlying affricates to surface fricatives (e.g., YNLC, 2005, p. 6). These surface fricatives do not alternate. In addition, some /ʃ/-initial words exceptionally do not alternate to [ʒ], which is also seen in Slave (Northern Dene) (K. Rice, personal communication, February 10, 2022).

fricative-initial noun stems in possessive constructions (also discussed in 1.5.1); unpossessed stems have an initial voiceless fricative (74), but the fricative is voiced in possessed forms (i.e., when preceded by a sonorant) (75). Stops and affricates do not alternate (76).[34]

(74) **Unpossessed (voiceless) fricative-initial noun stems**

łù	[ɬuː]	'whitefish'
khal	[xaːl]	'sled'
thü	[θɨː]	'pants'

(75) **Possessed (voiced) fricative-initial noun stems**

nlù	[n̥luː]	*[n̥ɬuː]	'your whitefish'
ughāl	[ʔuɣâːl]	*[ʔuxâːl]	'his/her sled'
kwädhū̄	[kʰʷəðîː]	*[kʰʷəθîː]	'their/your pants'

(76) **Non-alternating stop and affricate noun stems**

a.	*dì*	[tìː]	'tea'
	udì	[ʔutìː]	'his/her tea'
b.	*chu*	[tʃuː]	'water'
	nchū	[n̥tʃʰûː]	'your water'

In coda position, the stop [tʰ] surfaces as aspirated, and neither the plain nor ejective stop is a possible coda. In the representations in (72), aspirated stops have the feature SG, a dependent of LARYNGEAL, while plain stops are unmarked for laryngeal features. This raises the question of why plain stop [t] does not occur in coda position. While coda [tʰ] resembles onset /tʰ/, I propose that the aspiration is not featurally represented (i.e., as SG) in coda position; it is more accurately characterized as audible release (see Maddieson & Smith, 2013 for Tlingit; see also Goad, 2002; Laver, 1994, p. 355). This is motivated by the observation that this same coda stop surfaces as [t] when a stem is followed by the vocalic diminutive suffix (77).

(77) **Coda aspiration as audible release**

a.	*-mbat*	/maːt/	[ᵐbaːtʰ]	*[ᵐbaːt]	'older sister'
	-mbada	/maːt-a/	[ᵐbaːta]	*[ᵐbaːtʰa]	'older sister (diminutive)'
b.	*łat*	/ɬaːt/	[ɬaːtʰ]	*[ɬaːt]	'box'
	łata	/ɬaːt-a/	[ɬaːta]	*[ɬaːtʰa]	'small box'

[34] The only affricate that I have found to alternate is *tlį* [tɬʰį̈ː] 'dog', whose possessed form is *-dlį* [tɬ̂į̈ː] rather than expected *[tɬʰ̂į̈].

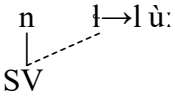
Proto-Dene is reconstructed as contrasting stem-final plain and ejective stops, with the contrast retained in some daughter languages (Leer, 1979). However, Southern Tutchone also does not permit ejective /t'/ in coda position. Therefore, coda position does not permit laryngeal contrasts. Formally, this is expressed as the inability to license a LARYNGEAL node (78).

(78) **Coda laryngeal licensing:** Codas cannot license LARYNGEAL.

Parallel to the lack of laryngeal contrasts in coda stops, the voicing of coda fricatives is also invariable. The lateral coda [l] is always voiced, never surfacing as the underlying voiceless lateral fricative /ɬ/ (where voiceless means lacking SV, as in (73)). As discussed above, while fricatives are underlyingly voiceless, the voiced allophone occurs following a sonorant. In Southern Tutchone, the derived voiced counterpart of [ɬ] is [l] rather than *[ɮ]. As shown by the representations in (73), the lack of [ɬ] in coda is not a question of licensing, since it is the voiced fricative which has the feature SV, while the voiceless fricative is unmarked. Instead, the question is why all lateral codas obtain SV.

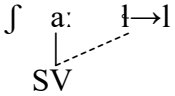
As described in Rice (1993), voiced stem-initial fricatives in Dene languages are derived through the spreading of SV from sonorant prefixes (79).

(79) **Stem-initial fricative voicing**



In languages like Navajo (Southern Dene), this process appears to only occur in stem-initial position; that is, stem-initial fricatives pattern the same as in Southern Tutchone, but fricative codas are generally voiceless unless followed by a suffix that triggers voicing (Rice, 1993). In Southern Tutchone, I propose that the spreading of SV, as shown in (79), occurs in all environments. That is, SV obligatorily spreads rightward, resulting in the voicing of post-sonorant fricatives in both onset and coda position (80).

(80) **Coda fricative voicing**



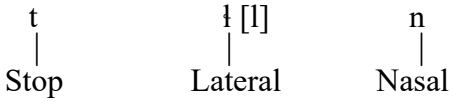
As shown in (76), stops and affricates do not alternate for voicing. I assume that they are not targets for the spreading of SV due to a feature cooccurrence restriction.[35]

[35] Specifically, I assume that SV cannot spread to segments bearing the feature Stop (introduced below).

The coda nasal [n] is always voiced, and voiceless *[n̥] does not occur in any environment, unlike in some Dene languages (e.g., Upper Tanana, Lovick, 2020). I therefore assume that nasals are underlyingly voiced (i.e., they have the feature SV specified underlyingly). Despite SV being present underlyingly, the coda does not necessarily have to license this feature: as with [l], SV could be licensed by the nucleus and spread to the nasal. In further representations I omit SV, leaving full examination of its status for future work.

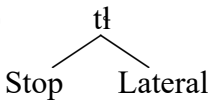
Turning to manner, as mentioned, Southern Tutchone codas have three possible manners of articulation: nasal [n], lateral [l] and stop [tʰ]. I assume that nasal [n] has the feature Nasal and lateral [l] has the feature Lateral.[36] Following Shaw (1991), stops and affricates have the feature Stop ([–continuant]), while other segments are unmarked. The representations of coda consonants in terms of manner are shown in (81).

(81) **Southern Tutchone coda consonant manner features**



While at first it may appear that manner features are not restricted in coda position, consonants with multiple manner features (i.e., affricates) are prohibited. While the alveolar stop and lateral are well formed codas, the alveolar affricate /tɬ/ is not. I assume that /tɬ/ has the representation in (82), following Shaw (1991) on Tahltan (Northern Dene).

(82)



Since /tɬ/ has no prohibited laryngeal features and has the same place specification as /t/ and /ɬ/ (further discussed in 4.2), I propose that the coda can license only a single manner feature in coda position (83).

(83) **Coda manner licensing:** Codas license a single manner feature (Nasal, Lateral, Stop).

That is, affricates are excluded from coda position due to their having multiple manner features.[37]

In summary, the underlying forms of possible coda consonants are /n, ɬ, t/. Surface voicing of /ɬ/ to [l] is due to SV spreading from the preceding vowels, while aspiration of /t/ to [tʰ] is simply release. That is, laryngeal contrasts are neutralized in coda position, since codas cannot

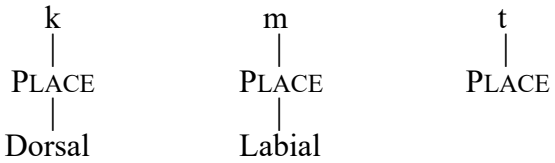
[36] I do not address the relationship between SV and Nasal (see, e.g., Rice & Avery, 1989).
[37] (83) does not rule out all affricates. Others are excluded on the grounds of place, as shown in 4.2.

license a Laryngeal node. On the other hand, codas license manner features, but cannot license multiple manner features, excluding affricates from coda position.

4.2 Place features in coda

While possible coda consonants contrast for manner features, in terms of place they are all coronal (specifically alveolar). There are two puzzles to address concerning the place features of codas: why non-coronals are excluded from coda position and why only a subset of coronals can occur in coda position. The first puzzle reflects a common crosslinguistic pattern whereby the coda cannot independently license a PLACE node or place features (e.g., Itô, 1986, 1989; Steriade, 1994). As stated earlier, I assume that a PLACE node is present for all non-laryngeal segments, so I initially propose that codas can only dominate a bare PLACE node (with licensing of PLACE addressed in 4.3). Under this proposal, parallel to the place features of non-central and central vowels, dorsal and labial consonants have features specified under PLACE, while (some) coronals have only a bare PLACE node (84).[38]

(84) **Place features of dorsal, labial and coronal consonants (provisional)**



An issue with the representations in (84) is that they do not address the second puzzle: namely, that not all coronals are possible codas. As discussed below, coronals that cannot appear in coda contrast with each other for place, motivating projection of Coronal and a dependent feature. To demonstrate the role of contrast, I turn to other languages that contain coronal harmony. While Southern Tutchone has no such synchronic process, coronals in Dene languages form two natural classes: those which participate in coronal harmony and those which are transparent (Hansson, 2010, pp. 147–152). In Tahltan, shown in (85), /s/ becomes [θ] when followed by dental /θ/ or [ʃ] when followed by palato-alveolar /tʃʰ/; the intervening segments /t, tɬ’/ are transparent to the harmony.[39]

[38] As seen in 1.5.1, /m/ (and its counterpart [ᵐb]) are the only labial consonants in Southern Tutchone.
[39] I adapt Shaw’s examples and representations to standard IPA with monovalent features.

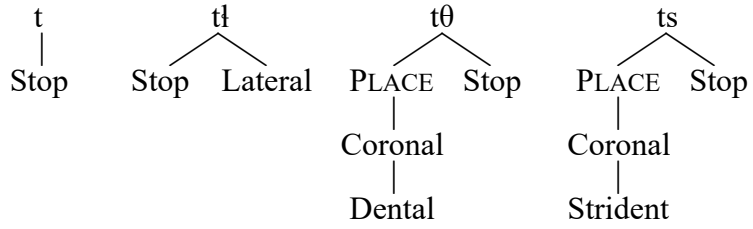
(85) **Tahltan coronal harmony** (Shaw, 1991, pp. 149–150)

/ɛtɛtɛstuːθ/ [ɛtɛtɛθ**t**uːθ] 'I whipped myself'

/jastɬ'ɛtʃʰ/ [jaʃ**tɬ'**ɛtʃʰ] 'I splashed it'

Shaw proposes that coronals form two natural classes with respect to place features: coronals that trigger or are targeted by coronal harmony have a Coronal feature (with surface changes involving spreading of the Coronal node and its dependents), and coronals that are transparent to the process have no Coronal feature and no PLACE node (86).

(86) **Selected Tahltan coronal stops and affricates** (Shaw, 1991, p. 146)



For a similar harmony in Chumash, Avery and Rice (1989) propose that transparent segments have a PLACE node but no Coronal feature. Although the details differ somewhat, the broad motivation for both analyses stems from the formal expression of contrast in the theory of Contrastive Underspecification envisioned by Avery and Rice (1989): the feature Coronal is only specified underlyingly when it has dependent features (such as Distributed or Strident).[40]

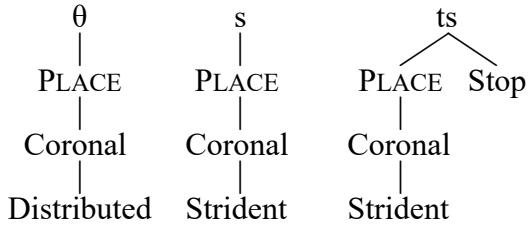
Extending Shaw's approach for Tahltan to Southern Tutchone but adapting the view from Avery and Rice that "placeless" coronals bear a PLACE node, permitted codas have the features in (87). Crucially, no possible coda consonant has the feature Coronal specified under PLACE.

(87) **Southern Tutchone coda consonant features**

On the other hand, the coronal consonants that are not permitted in coda have a Coronal feature, due to having features that are dependents of Coronal (88).

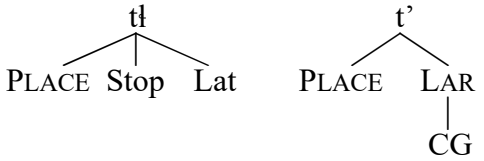
[40] For arguments regarding the feature Lateral not being a dependent of Coronal, see Rice and Avery (1991).

(88) **Southern Tutchone coronals with dependent features**



Other coronal consonants that do not require a Coronal node that are nonetheless excluded from coda position have multiple manner features, such as /tɬ/, or require laryngeal features, such as /t'/ (89), as previously discussed in 4.2.

(89)



Since the coda is restricted in terms of place, it may be expected that the truly placeless consonants, i.e. the laryngeals, are well-formed codas in Southern Tutchone. However, they are excluded from coda position. I propose that this is due to their laryngeal features and so is independent of place. I assume that /h/, which involves a spread glottis, has the laryngeal feature SG, like aspirated /tʰ/, and /ʔ/, which involves a constricted glottis, has CG, like the ejective consonants /t'/; see (89).

Coda /ʔ/ and ejective consonants are proposed to have become low tone in Southern Tutchone (Ritter, 1976, 1983). Many Dene languages are proposed to have undergone tonogenesis in which vowels initially became "constricted" through coarticulation with glottalized codas; eventually, the glottalization of the coda consonant was lost (as were many coda consonants entirely) and only the tone remained (Kingston, 2005; Leer, 1979, 1999). Dene languages differ in whether constricted vowels became high or low tone (known as high- and low-marked languages, respectively), and Kingston (2011) highlighted the case of Northern and Southern Tutchone. The languages share a common ancestor but became high- and low-marked, respectively. /h/, on the other hand, is not documented as a source of tonogenesis in the Dene family, aside from Ritter's proposals for Northern and Southern Tutchone discussed below.

There is no longer synchronic evidence for low tone being underlying /ʔ/ in coda position in Southern Tutchone, since [ʔ] does not surface when a low tone vowel is followed by the vowel-initial diminutive suffix *-a* (90). That is, there are no alternations in which what could be an

underlying glottal stop, which is realized as a low or falling tone in final position, surfaces as [ʔ] when syllabified in onset position.[41]

(90)	*utsì*	[ʔutsʰìː]		‘his/her grandfather’
	utsìa	[ʔutsʰìːa]	*[ʔutsʰiːʔa]	‘his/her (dear) grandfather’ (diminutive)

There is, in fact, no evidence for phonemic /ʔ/ in nouns. In the present day grammar, [ʔ] only occurs as an epenthetic onset for vowel-initial words, as evident in (90). The initial vowel must be preceded by a pause, as shown by comparing the two examples in (91): [ʔ] is inserted before the vowel-initial verb prefix /ə-/ only in the first example.[42]

(91)	*ätsi*	/ə-tsʰiː/	[ʔətsʰiː]	‘he/she is making it’
	ǜ ätsi	/ɨː ə-tsʰiː/	[ʔɨː ətsʰiː]	*[ʔɨː ʔətsʰiː] ‘(geese) are making a vee-shape’

While the status of phonemic /ʔ/ is uncertain, I propose that there is clear evidence for underlying /h/, which is realized as a slight rising tone (92).[43] Such rising tones are commonly not transcribed. Tlen (1993) states that the rising tone is “almost [imperceptible]” (p. 74).

(92) **Final /h/ as rising tone**

jí	/tʃiːh/	[tʃǐː]	‘spruce grouse’
gá	/kaːh/	[kǎː]	‘rabbit’
łú	/łuːh/	[łǔː]	‘fish’

Ritter (1983) proposed that the change from coda /h/, itself derived from eroded codas, to rising tone is a historical change. However, there is evidence in verbs that /h/ remains a phoneme of Southern Tutchone, with its realization as rising tone being a synchronic process. In Dene languages, verb stem-initial fricatives become voiced when preceded by a vowel or sonorant consonant (Rice, 1994), mirroring the process in nouns discussed in 4.1. However, this process is blocked in Southern Tutchone when the stem is preceded by a prefix that surfaces with rising tone; that is, the underlying /h/ of the first person prefix /ih-/ blocks the allophonic voicing (93), but the sonorant-final prefixes do not (94).[44]

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[41] Low or falling tone syllables are produced with creaky voice, particularly before a pause. Previous work (e.g., Leer, 2005, p. 258) has sometimes transcribed such syllables as having final glottal stops. However, it appears that the sound transcribed [ʔ] only surfaces in male speakers, who have significant delay between the termination of voicing and the end of creak. Similar observations are made for Slave (Northern Dene) in Rice (1989).

[42] The status of /ʔ/ is left for future work. Aside from initial position, as in nouns, [ʔ] occurs in verbs in word-final position (independently of low tone), as in *ch’e’* [tʃʔeːʔ] ‘it is’, and in word-medial position, *ní’į̄* [nǐʔi̯ː] ‘I see it’.

[43] Although I transcribe the rising tone as [V̌], suggesting a low-to-high trajectory, it is more accurately described as a high-to-extra high contour.

[44] The lack of alternation in noun stem-initial fricatives with rising tone prefixes is typical across the family. I briefly discuss the asymmetry in the realization of prefix-final /h/ between nouns and verbs in 6.2.

(93) **Voiceless stem-initial fricative following /h/**

ílį	/i**h**-ɬiː-n/	[ʔiɬ̥ịː]	‘I danced’

(94) **Voiced stem-initial fricative following sonorants**

nlį	/n-ɬiː-n/	[n̥lịː]	‘you danced’
älį	/ə-ɬiː-n/	[ʔəlịː]	‘he/she danced’

Therefore, Southern Tutchone excludes laryngeal codas on the basis of coda position disallowing the licensing of the LARYNGEAL node, as defined in (78). While historical /ʔ/ became tone and is possibly no longer present as an underlying segment, post-vocalic /h/ remains in the grammar, being realized as a slight rising tone.[45] The mechanism through which the SG feature of /h/ is realized as tone is left for future work.

In summary, I propose that coda consonants are restricted in their place, manner and laryngeal features. In terms of place, codas can only dominate a bare PLACE node (i.e., one with no dependent features), excluding all non-coronal consonants and coronals with the specified feature Coronal. In terms of manner, codas can license the features Lateral, Nasal or Stop, but cannot have multiple manner features (such as those of the affricate /tɬ/ in (89)). Finally, codas cannot license a LARYNGEAL node, excluding laryngeal contrasts and laryngeal consonants (segments bearing SG and CG) from coda position. I mentioned that coda position can dominate a bare PLACE node. If this position were able to license PLACE, it would appear that the place and laryngeal dimensions differ in terms of the type of material that can be licensed: a bare PLACE node in the former case, but no LARYNGEAL node in the latter. However, in 4.3, it becomes clear that they are, in fact, parallel: codas license neither node.

4.3 Place sharing

Finally, I address the issue that only central vowels can precede codas. My key proposal is that coda place features are parasitically licensed by the nucleus through sharing, with additional constraints on coda licensing restricting the available place features which can be shared. As shown in 3.3 and 4.2, both central vowels and possible coda consonants have the same place features; namely, they both have a bare PLACE node with no dependents.[46]

[45] Onset [h] is rare, and I have only recorded a small number of examples in verbs and none in nouns.
[46] For related discussion of the interaction of coronals with bare PLACE and central vowels in Latin, see Emonds (2014).

In the literature, place sharing between vowels and consonants is well documented (e.g., Clements, 1991). In addition, codas commonly share place; however, place sharing generally takes place between a coda and the following onset (e.g., Itô, 1986; Piggott, 2003). The sharing of place between a nucleus and coda (or within the rhyme) is seemingly less common. It is observed in Omani Arabic (Afro-Asiatic), whereby in imperfectives and broken plurals, the final vowel takes the place specification of the following consonant (95).

(95) **Imperfectives in Omani Arabic** (al-Aghbari, 2004, p. 96)

a.	šaṭab	‘cross out (perfective)’
	jišt**ub**	‘cross out (imperfective)’
b.	ɣasal	‘wash (perfective)’
	jiɣs**il**	‘wash (imperfective)’

A similar pattern is also seen in epenthesis and reduplication, where epenthetic or reduplicant vowels obtain place features from adjacent consonants (Alderete et al., 1999); in Nancowry (Austroasiatic), the reduplicant is VC where the consonant is a copy of the final consonant of the root and the vowel takes the place features of the consonant.

(96) **Reduplication in Nancowry** (Alderete et al., 1999, pp. 348–349)

a.	sut	‘to rub’
	itsut	‘to kick with the foot’
b.	rom	‘flesh of fruit’
	umrom	‘to eat pandanus fruit’

In the cases just described, a vowel acquires place features from the following consonant through place sharing in limited contexts, including those where the vowel underlyingly lacks melodic content. In Southern Tutchone, however, it is the consonant that acquires place features from the vowel. I propose that this is a result of the coda being a weak licenser; it cannot license PLACE (97).

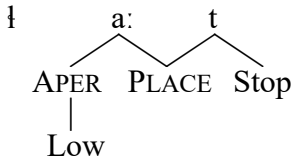
(97) **Coda place licensing:** Codas cannot license PLACE.

To satisfy (97), the coda consonant requires the vowel to license its features through place sharing (thereby restricting the quality of the nucleus) (98).

(98) **Place sharing (version 1):** Coda PLACE must be licensed parasitically through sharing with the preceding nucleus.

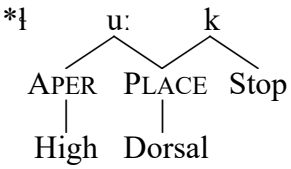
With the restrictions on vowels in closed syllables and coda consonants described in 3.3 and 4.2, respectively–namely, that a closed syllable rhyme must consist of a central vowel followed by a coronal consonant with a bare PLACE node–PLACE is shared between the nucleus and coda (99).

(99) **Sharing of bare PLACE**



As discussed in 4.2, the PLACE node of coda consonants cannot dominate dependent features, prohibiting closed syllables like that in (100), where features specified under PLACE would nonetheless be shared.

(100) **Illicit sharing of PLACE with dependent features**



However, there is no restriction on vowel quality in open syllables; that is, the nucleus is capable of licensing all vowel features (101).

(101) **Vowel place features in open syllables**

Therefore, the place restriction on vowels in closed syllables must be entirely due to limitations on what features the coda can dominate (102). (102) is a revision of (98), with new material underlined.

(102) **Place sharing (version 2):** Coda PLACE must be licensed parasitically through sharing with the preceding nucleus. <u>Shared PLACE can have no dependent features.</u>

To summarize, the coda cannot license PLACE, which is instead licensed by the nucleus and shared with the coda. Only bare PLACE can be shared due to the coda being unable to dominate any features specified under PLACE. As a result, closed syllables in Southern Tutchone can only consist of a central vowel followed by a "placeless" coronal.

Chapter 5: Challenges from complex vowels

Chapter 3 discussed the monophthongs of Southern Tutchone, with Chapter 4 addressing coda consonants and the interaction between the two. I had set aside complex vowels, of which there are five in Southern Tutchone: three diphthongs and two rhotacized vowels. In 5.1, I address asymmetries between the rising diphthong /jə/, on one hand, and the falling diphthongs /əj, əw/, on the other, in terms of their presence/absence in closed syllables. I propose that place sharing takes place between the coda and the immediately adjacent element of the nucleus, rather than among all segments of the rhyme; that is, only nuclei that have an element with a bare PLACE node at the right edge can precede a coda. Then, in 5.2, I discuss challenges in the representation of rhotacized vowels, specifically addressing their production as central despite previous work suggesting that consonants and vowels with a similar tongue posture in other languages should be either coronal or dorsal. I propose instead that the rhotic gesture, at least in vowels in Southern Tutchone, is encoded by the feature R, which stands for Retroflex or Rhotic, a direct dependent of PLACE.

5.1 Diphthongs

Southern Tutchone has three diphthongs: rising /jə/ and falling /əj, əw/.[47] I first propose representations for each diphthong before discussing their interaction with place sharing.

The diphthong /jə/ is subject to inter- and intraspeaker variation in production. /jə/ is most commonly realized as [jɛ], with /ə/ fronted to [ɛ~ɜ], because /ə/ is preceded by Coronal /j/ (103).

(103)	*tthël*	/tθʰjəl/	[tθʰjɛl]	‘fence’
	mbët	/mjət/	[ᵐbjɛtʰ]	‘lake trout’
	ts’ën	/ts’jən/	[ts’jɛn]	‘ghost’

Fronting is also optionally seen in /ə/, especially when adjacent to a high or front vowel. For example, in (104), /ə/ can be fronted due to the following high vowel /uː/. In (105), the second /ə/ can be fronted before /eː/, while the first /ə/ cannot. On the other hand, no fronting can occur in (106), where /ə/ is the only vowel.[48] As introduced in 1.5.3, /-Ø̀/ represents a low tone suffix.

[47] I briefly discuss the status of a fourth possible diphthong, /wə/, and labialized consonants in 6.2.

[48] As noted in 2.2 and elsewhere, I generally transcribe /ə/ as [ə] regardless of its realization. I leave closer study of the realisation of /ə/ for future work.

(104)	*däkų̨*	/tə-kʰùːn-Ò/	[tɛkʰų̀ː]	‘his own house’
(105)	*äłäkē*	/əɬə-kʰeː-Ò/	[ʔəɬɛkʰêː]	‘each other’s shoes’ (Lake Laberge)
(106)	*shän*	/ʃən/	[ʃən]	‘me’ (Kluane)

The production of this diphthong in a way which corresponds exactly to its proposed underlying representation (i.e., [jə]) is also attested but less commonly; for example, ‘song’ /xjən/ is written *khyän* in YNLC (2002, p. 195) and is pronounced as [xjən] in the accompanying recording, rather than the more commonly attested *khën* [xjɛn].

As discussed in 3.2, the rising diphthong /jə/ is light; it patterns with /ə/ as monomoraic. In addition, the falling diphthongs /əj, əw/ are heavy; they pattern as bimoraic (see Schane, 1973). This weight difference can be seen in the realization of a nasal coda, where /jə/ cannot be nasalized but can take a nasal coda (107), while /əj, əw/ can be nasalized like other long vowels (108).[49]

(107) **Light (rising) diphthong and /ə/ with coda [n]**

khën	/xjən/	[xjɛn]	*[xjɛ̨]	‘song’
män	/mən/	[mən]	*[mə̨]	‘lake’

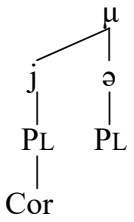
(108) **Nasalized heavy (falling) diphthongs and /i:/**

-mäy	/məjn/	[mə̨j]	*[məjn]	‘aunt (same clan)’
gäw	/kəwn/	[kə̨w]	*[kəwn]	‘drum’
tlį	/tɬʰiːn/	[tɬʰį̀ː]	*[tɬʰiːn]	‘dog’

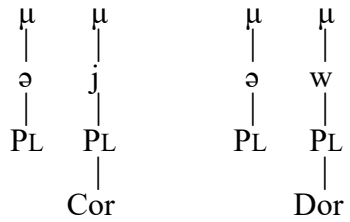
I assume that both light and heavy diphthongs consist of two melodies encoding their phonetic quality (Harris et al., 1999; Jakobson, 1971); the two melodies, expressed as separate PLACE nodes in (109) and (110), form a single segment (linked to a single mora) in light diphthongs, while each melody forms a separate segment (linked to a separate mora) in heavy diphthongs. In all diphthongs, the two melodies are /ə/ and a glide with features equivalent to the corresponding high vowel, as shown in (109) and (110). I exclude height features from these representations.

[49] The word *gäw* ‘drum’, with a high tone, is also commonly low tone *gə̀w*.

(109) **Light (rising) diphthong representation**



(110) **Heavy (falling) diphthong representations**



The pre- and post-vocalic glide components in these strings can be shown to be part of the nucleus, thereby truly forming a diphthong, rather than part of the the onset in (109) or coda in (110). Concerning the rising diphthong, if the glide component of /jə/ instead formed part of a complex onset, we would expect there to be restrictions on the place and manner of articulation of the onset consonant: if /j/ were part of a complex onset, we would expect the other element of the onset to be limited to obstruents (e.g., Kaye et al., 1990); instead, consonants of any manner, including sonorants like nasal [m], can precede /j/ (111). Furthermore, if /j/ were in the onset, we might expect that coronals would be prohibited in onset position (as in, e.g., American English, Davis & Hammond, 1995); however, consonants of any place of articulation, including coronal [tsʰ] can precede /j/ (112).

(111) **/jə/ with nasal, fricative and affricate onsets**

mə̀n	/mjə̀n/	[mjɛ̀n]	‘snare’
khën	/xjən/	[xjɛn]	‘song’
tl’ël	/tɬ’jəɬ/	[tɬ’jɛl]	‘rope’

(112) **/jə/ with coronal, labial and dorsal onsets**

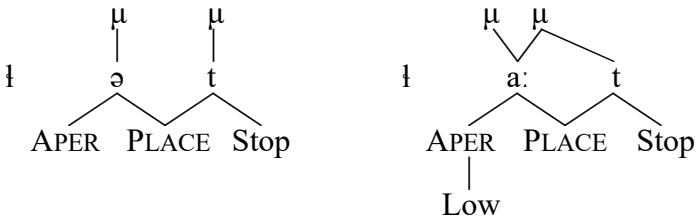
tsël	/tsʰjəɬ/	[tsʰjɛl]	‘snowdrift’
mbët	/mjət/	[ᵐbjɛtʰ]	‘lake trout’
khël	/xjəɬ/	[xjɛl]	‘pack load’

The lack of complex onsets is not surprising, since there are no other complex onsets in Southern Tutchone, as is typical of Dene languages (Goad & Travis, 2021; McDonough, 2019; Tuttle, 2010). Concerning the falling diphthongs, the glide components of /əj, əw/ have dependent

features under PLACE, as shown above in (110), which should exclude them from coda position under the analysis provided in 4.3.

As we have affirmed that these strings truly form diphthongs, the nucleus contains two sets of place features–one for each melody. This raises questions concerning the nature of feature licensing and the domain of place sharing. In our previous discussion of monophthongs, place sharing holding throughout the rhyme or between the nucleus and coda yielded empirically identical results, since the nucleus contained a single melody (113).

(113) **Place sharing with monophthongs**



However, since diphthongs are well formed, the nucleus must license the place features of both /ə/ and the glide.

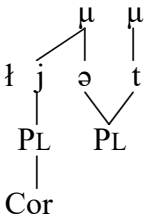
Among diphthongs, light /jə/ can precede a coda but heavy /əw, əj/ cannot. The difference in weight cannot account for the asymmetry, since both long and short monophthongs can precede codas, as shown in (113) and discussed previously in 3.2. The solution lies in the domain of place sharing: Place sharing does not take place among all three elements within the rhyme, since the nucleus is a strong licenser. Instead, it takes place between the coda and the linearly adjacent element of the nucleus (114). (114) is a revision of (102), with new material underlined.

(114) **Place sharing (final version):** Coda PLACE must be licensed parasitically through sharing with <u>the linearly adjacent PLACE node of</u> the preceding nucleus. Shared PLACE can have no dependent features.

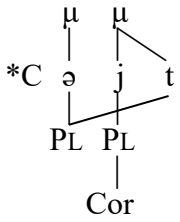
The revised adjacency requirement accounts for the asymmetry in (115); the light diphthong with /ə/ on the right can share PLACE with a string-adjacent coda, but the heavy diphthong with /ə/ on the left cannot without yielding crossed association lines (contra Goldsmith, 1976).

(115) **Place sharing with diphthongs**

a. Light



b. Heavy



In summary, diphthongs are compatible with the place sharing analysis of closed syllables. In fact, they clarify that place sharing takes place between the coda and the adjacent element of the nucleus. Place sharing can take place between the light diphthong /jə/ and a coda, since the rightmost element /ə/ has a bare place node to share with the coda. On the other hand, the heavy diphthongs cannot precede a coda, since their rightmost element /j, w/ has dependent features under PLACE.

5.2 Rhotacized vowels

Rhotacized vowels are unattested in the Dene language family aside from in Southern Tutchone. Retroflex consonants, on the other hand, are more common, particularly in Alaska and the Yukon (Cook, 1981, p. 255), and are reconstructed in Proto-Dene as retroflex palato-alveolar affricates and palato-alveolar fricatives (Leer, 2005).[50] Before continuing, we first need to discuss three categories of *r*-like sounds in terms of place: rhotics, retroflex consonants and rhotacized vowels. First, rhotics (e.g., /r, ɹ, ʁ/) generally pattern as placeless in terms of phonotactics (e.g., Goad & Rose, 2004; Rice, 1992). Second, retroflex consonants (e.g., /ʈ, ʂ, ɻ/) have been analyzed as having a Retroflex (or Laminal) feature that is a dependent of Coronal (e.g., Avery & Rice, 1989; Walsh Dickey, 1997), similar to the dependent features discussed in 4.2. Third, rhotacized vowels (e.g., [ɚ, ɑ˞, ɔ˞]) are linked to backness, with rhotacized front vowels being "dispreferred" (Hamann, 2003, p. 139).

Southern Tutchone has neither a rhotic nor retroflex consonants (but see discussion of dialectal forms below), but it has two rhotacized vowels: [ɨ˞ː, ɚː]. Rhotacized vowels in Southern Tutchone generally occur in stems that are reconstructed as having retroflex or palato-alveolar

[50] Leer reconstructed two series of palato-alveolar affricates contrasted by retroflexion. However, he did not reconstruct a series of retroflex fricatives. In earlier work (e.g., Cook, 1981; Krauss & Golla, 1981), two complete palato-alveolar series (including fricatives) were reconstructed as being contrasted by labialization (corresponding to Leer's retroflexion).

codas in Proto-Dene. In (116), Southern Tutchone forms are shown alongside reconstructions adapted from Alderete et al. (2021).

(116) **Rhotacized vowels from Proto-Dene codas**

tsür	[tsʰɨ˞ː]	'firewood'	< *tˌʃʰətˌʃʰ
-ts'ür	[ts'ɨ˞ː]	'kidney'	< *tˌʃ'ətˌʃ'
shär	[ʃɚː]	'bear'	< *xəʃ

In present-day Southern Tutchone, rhotacized vowels can be nasalized but they cannot precede a coda (117), similar to the long non-central vowels /iː, eː, uː/.

(117) **Phonotactics of rhotacized vowels**

a. Nasalization

łür	[ɬɨ̃˞ː]	'dwarf birch'
ch'ą̈r	[tʃ'ɚ̃ː]	'fish hook'

b. Codas

*Cɨ˞ːC

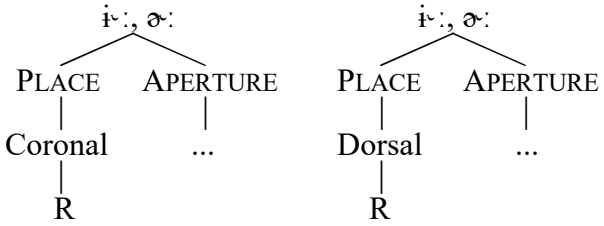
*Cɚː C

Reflecting the orthography, it might be assumed that <r> is a coda, with rhotacized vowels consisting of a non-rhotacized nucleus <ü, ä> /ɨː, ə/ and a rhotic coda. In addition, the crosslinguistic patterning of rhotics as placeless appears to be compatible with constraints on coda place discussed in 4.2. However, there are three main issues with this analysis: One, there is no rhotacized <a> /aː/ (but see below), even though this vowel can occur in other closed syllables. Two, there is no evidence for a phonemic rhotic, since orthographic <r> is never found in onset position. Three, the distribution of rhotacization does not resemble that of nasalization: while long /ɨː/ is realized as [ɨ̃ː] before underlying /n/, short /ə/ before /n/ is not nasalized, instead being realized as [ən]. That is, if rhotacization paralleled nasalization, we would expect the rhotacized vowel corresponding to short /ə/ to surface with a rhotic coda. Therefore, an alternative analysis is required.

I propose instead that rhotacized vowels are underlyingly rhotacized; that is, the phonemic vowel inventory contains two rhotacized vowels, where the feature indicating rhoticity is an inherent part of the vowel. For convenience, I assume that rhotacized vowels are differentiated from other vowels through the feature R, which stands for Retroflex (Morén-Duolljá, 2011) or Rhotic. I discuss two options: R as a place feature and R as manner.

In terms of place features, the challenge for the representation of rhotacized vowels in Southern Tutchone is that they are produced as central vowels but earlier literature on other languages suggests a featural representation which predicts their articulation as either front or back. As mentioned earlier, R (in retroflex consonants) is often analyzed as a dependent feature of Coronal (e.g., Avery & Rice, 1989; Walsh Dickey, 1997). If rhotacized vowels parallel retroflex consonants, this would predict that rhotacized vowels are front (i.e., Coronal). However, Hamann (2003) noted that front rhotacized vowels are generally avoided crosslinguistically, with rhotacized vowels generally being produced as back. In terms of feature geometry, Hamann's observation could indicate R as a dependent of Dorsal. Both of these options are shown in (118).

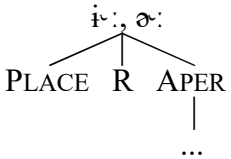
(118) **Rhoticity as place (provisional)**



The main issue with (118) lies in the articulation of the rhotacized vowels in Southern Tutchone: both are central. Clearly, the representation of rhoticity as a place feature is insufficient.[51]

Instead of being a place feature, I propose that R is a manner feature. Since rhotacized vowels are central, they have bare PLACE. As mentioned, rhotics crosslinguistically are analyzed as placeless by some researchers (Rice, 1992), because, for example, they are not subject to place restrictions in the syllabification of complex onsets, regardless of whether they are articulated as coronal or dorsal (Goad & Rose, 2004). As with the consonant manner features discussed in 4.1, I assume that the feature R is a dependent of the ROOT node, giving the representation in (119).

(119) **Rhoticity as manner**



[51] I do not discuss the possibility of R as a direct dependent of PLACE, as I assume that the dependents of PLACE are limited to the major place features (Labial, Coronal, Dorsal).

The featural representation of rhoticity is proposed to be language-specific (e.g., Avery, 1996, pp. 41–46). As such, the representations in (118) for R in retroflex consonants and rhotacized vowels as a dependent of Coronal or Dorsal will hold for some languages. In Southern Tutchone, though, rhotacized vowels are placeless, and R is a manner feature. One issue with this representation is that it does not provide a featural explanation for the lack of rhotacized vowels in closed syllables, since they could conceivably share bare PLACE with a coda (see analysis of other central vowels in 4.3); however, as with central /ɨː/, rhotacized vowels are derived from historic codas, as shown earlier in (116), so this gap is not unexpected.

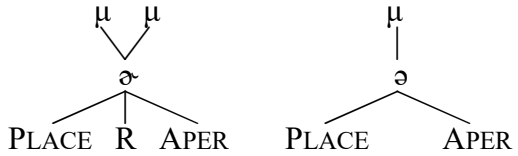
Aside from place and manner, the rhotacized vowels in Southern Tutchone also need to be specified for height, since high [ɨˠː] and mid [əˠː] are contrastive (120).

(120) **Height contrasts in rhotacized vowels**

a.	*shär*	[ʃəˠː]	‘bear’
	shür	[ʃɨˠː]	‘inconnu’
b.	*-mbär*	[ᵐbəˠː]	‘niece/nephew’
	mbür	[ᵐbɨˠː]	‘knife’

A first assumption is that they share the height features of the corresponding vowels /ɨː, ə/. There are two main points to address: First, the status of /ə/ as a short vowel (and its lack of lengthening) is linked to its lack of both place and height targets, as discussed in 3.3. Since rhotacized vowels lack a place target (as central vowels), /əˠː/ as a mid vowel like /ə/ would make it the only long vowel with neither a place nor height target (121).

(121) **Length and height: /əˠː/ and /ə/ (provisional)**



Second, both rhotacized vowels have dialectal productions (possibly influenced by Northern Tutchone) in which a rhotic is produced as the second half of an onset “cluster” (Tlen, 1993, p. 75) (122); /ɨˠː/ corresponds to high [ɻuː], and /əˠː/ corresponds to low [ɻaː ~ ɻɑː] but not to mid *[ɻə] or *[ɻoː].[52]

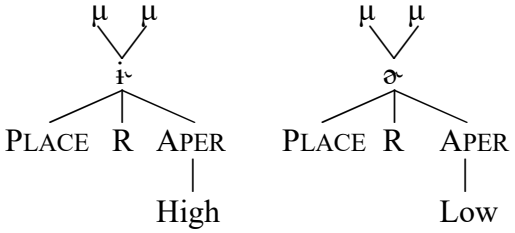
[52] In the dialectal form for ‘bear’ in (122), I do not transcribe <shr> as [ʂ], since the rhotic gesture follows the palato-alveolar [ʃ]. In Northern Tutchone, the corresponding sequence is written <sr> and is produced [ʂ].

(122) **Dialectal productions of rhotacized vowels**

a.	*ür*	[ʔɨ˞ː]		‘clothing’
	’ru	[ʔɻuː]		‘clothing’ (dialectal)
b.	*shär*	[ʃɚː]		‘bear’
	shra	[ʃɻaː]	*[ʃɻə], *[ʃɻoː]	‘bear’ (dialectal)

While I do not provide an analysis of the dialectal productions, I take them as evidence that /ɨ˞ː/ is underlyingly a high vowel and /ɚː/ is underlyingly a low vowel, as in (123).

(123) **Rhotacized vowels (final)**



In summary, the R feature (Retroflex or Rhotic) in Southern Tutchone rhotacized vowels cannot be analyzed as a place feature, since dependence on Coronal or Dorsal would predict that they be articulated as front or back vowels, respectively. Instead, I propose that R is a manner feature, with rhotacized vowels retaining a bare PLACE node, as in other central vowels. The two rhotacized vowels are also specified for height–Low and High–based on evidence from dialectal productions.

Chapter 6: Conclusion

This thesis has presented data from Southern Tutchone, a Northern Dene language, examining rhyme constraints in noun stems. Restrictions on nouns stems have been shown to be due to the interaction of underlying vowel length, vowel place features and consonant place features.

In Chapter 3, I provided an analysis of the Southern Tutchone vowel system. In 3.1, I examined the reconstructed distinction between full and reduced vowels in Proto-Dene, showing the orthographic distinction in Southern Tutchone to not correspond with phonological natural classes. In 3.2, I proposed that vowels must be specified for length underlyingly. I showed that /ə/ is monomoraic, reflected in its inability to form an open syllable stem, while all other vowels are bimoraic. I additionally proposed that codas following /ə/ are moraic through Weight by Position, since closed syllable stems containing /ə/ are well formed.

I also examined nasalization, showing that underlying nasals have two possible realizations: as nasalization following long vowels, and as a nasal coda following short vowels. In 3.3, I turned to place of articulation in vowels, noting that central vowels form a natural class in that they can precede codas while other vowels cannot. I therefore proposed that, while front and back vowels have place targets, formalized as features specified under PLACE, central vowels have only a bare PLACE node. I provided full representations for monophthongs in 3.4.

In Chapter 4, I examined the features of coda consonants and their licensing. In 4.1, I showed that laryngeal contrasts are neutralized in coda position, formalized as the inability of the coda to license a LARYNGEAL node. On the other hand, drawing on the ability of segments with different manners of articulation to occur in coda position, I showed that the coda can license a single manner feature. In 4.2, I proposed that surface coronal consonants form two natural classes in terms of place features: those with a bare PLACE node, and those with the feature Coronal specified under PLACE. I showed that coronals proposed to lack the feature Coronal in analyses of coronal harmony in other Dene languages are the only possible codas in Southern Tutchone. Presence or absence of contrasts among classes of coronals also motivated these representations.

In 4.3, I proposed that PLACE in coda is licensed parasitically through sharing with the nucleus. In open syllables, the nucleus is not restricted in terms of place features, but only central vowels are permitted in closed syllables; that is, in closed syllables, the nucleus and coda must

have the same place features. I therefore proposed that the nucleus licenses PLACE in closed syllables and shares the node with the following coda: the result is that the nucleus, a strong licenser, exhibits place neutralization in order to license place features of the coda, a weak licenser.

In Chapter 5, I investigated potential challenges to my analysis from diphthongs and rhotacized vowels. In 5.1, I showed that diphthongs provide additional evidence for the nucleus as a strong licenser, since both melodies of a diphthong are in the nucleus; that is, glides within diphthongs are not syllabified as either onsets or codas. The distribution of diphthongs in closed syllables clarified the domain of place sharing: only diphthongs with /ə/ as the rightmost element (as opposed to those with a glide as the rightmost element) can precede a coda. Therefore, only the linearly adjacent place node of the nucleus can be shared with the coda.

In 5.2, I examined possibilities for the representation of rhotacized vowels, concluding that rhoticity in Southern Tutchone is a manner feature. The option of rhotacized vowels having R as a place feature was excluded due to rhotacized vowels being articulated as central, despite representations for retroflex consonants and rhotacized vowels in other languages requiring them to be front or back. I therefore proposed that a manner feature provides the rhotic gesture, with rhotacized vowels retaining a bare PLACE node like other central vowels. Drawing on dialectal productions, I proposed that the two rhotacized vowels are underlyingly High and Low, despite the low vowel being articulated as mid.

6.1 Contributions

The empirical contribution of this thesis is the presentation of new data on an understudied and critically endangered language. In addition to the data included in my analysis, all fieldnotes, recordings and time-aligned transcriptions are archived at YNLC and available to community members and researchers. I have also shown that Southern Tutchone challenges generalizations about coda place licensing. Languages that require reconsideration of the scope of typological diversity have the potential to inform future linguistic theory.

Turning to theoretical contributions, since the onset of Optimality Theory (Prince & Smolensky, 1993) much research in phonology has argued against or been agnostic to segment-internal structure and underspecification (see discussion in Uffmann, 2011). However, I have

shown that rhyme constraints in Southern Tutchone are best captured by including both in the theory of segmental representation.

Central to this thesis is the role of the PLACE node, which must be shared between the nucleus and coda to express constraints on the place features of both the coda and the preceding nucleus (4.3). In feature geometry, PLACE is an organizing node with no phonetic content which dominates major place features. Features like Coronal have phonetic content and represent an articulatory target. However, in the framework of underspecification that I have employed, which includes an important role for contrast in determining representations, a segment with the unmarked place of articulation can be represented with a PLACE node with no dependents. Crucial to my analysis of Southern Tutchone is that the phonetic interpretation of this underspecified place of articulation can vary between consonants and vowels: bare PLACE is anterior coronal in consonants but central in vowels. Therefore, central vowels and a subset of coronals are able to share place features due to the feature geometric node PLACE and variable phonetic interpretation of underspecified representations.

Turning to licensing, crosslinguistically parasitic licensing of coda features through sharing with a strong position is common. However, that strong position is usually the following onset (e.g., Itô, 1986; Piggott, 2003). I have shown that the licensing of coda features involves feature sharing with the nucleus. This does not appear to be a widespread phenomenon across languages and thus provides an additional point of view for the typology of feature licensing. In Southern Tutchone, we saw that place sharing is between the rightmost element of the nucleus and the coda in 5.1: only the light diphthong /jə/ can precede a coda and not the heavy diphthongs /əj, əw/; that is, only those vowels with a bare PLACE node immediately adjacent to the coda can share place. The adjacency requirement in diphthongs provides additional evidence for feature geometry, in that appealing to crossed association lines being prohibited (Goldsmith, 1976) provides an explanation for the asymmetry between light and heavy diphthongs.

6.2 Future work

This section outlines three directions for future work: possible additional phonemes, the surface forms of the possessive suffix, and verb-noun asymmetries in the realization of /h/. The latter two points both involve the phonology-syntax interface; specifically, they address the role of phonological spellout and its relation to syntax.

In this thesis, as stated in 1.5.1, I assumed that labialized velar consonants are phonemic; that is, I assumed that CwV strings consist of a phonemic labialized consonant (C^w) and a vowel. However, the distribution of CwV strings suggests that the picture is more complex. Unlike CjV strings that consist of an onset consonant and the diphthong /jə/ (5.1), the onset consonant in CwV strings must be a velar(124).

(124) **CGV strings in Southern Tutchone**

a. CjV

khën	/xjən/	[xjɛn]	'song'
tthël	/tθʰjəl/	[tθʰjɛl]	'fence'

b. CwV

-gwà̱t	/kʷət-Ø/	[kʷətʰ]	'knee'
kwà̱n	/kʰʷən/	[kʰʷən]	'fire'
	*twV		

That is, the labial element of CwV appears to be restricted in both what precedes and what follows it, suggesting that it may be a dependent of both the onset and nucleus (e.g., Anderson, 1986; English [j] in Giergerich, 1992; French [j] in Klein, 1991; Hindi [w] in Mokha & Goad, 2022). Such an analysis may also reflect the proposed historical origin of CwV as *Cʊ: *Cʊ became Cə unless the preceding consonant was velar, in which case the consonant became labialized (Ritter, 1982).

In addition, I did not address a limited set of palatal consonants. Such consonants are highly infrequent and differ from CjV strings in that the following vowel can be any non-front vowel (125), not simply [ə]. They are not listed as their own place of articulation or as segments separate from velars in documentation of either orthography of Southern Tutchone.

(125) **Additional CjV strings**

khyù̱	[ɕɨː]	'hill'
gyų̣	[cų̣ː]	'vomit'
kyäw	[cʰəw]	'copper knife'
kyal	[cʰaːl]	'credit'

Due to their low frequency, the status of such strings requires further study. Therefore, future work must examine the status of both labialized and palatalized velar consonants.

This thesis primarily addressed phonology at the level of the stem, with some reference to affixes. The interaction of affixes and stems presents alternations that may not be entirely phonological. Instead, I propose that syntax may play a role in such alternations, and future work should examine the phonology-syntax interface. One possible direction is the realization of the tonal possessive suffix, in the framework of spellout by phase (Newell, 2008).[53] In 2.1, we saw that there are two surface forms of the possessive suffix: alienable nouns acquiring a falling tone and inalienable nouns acquiring a low tone. In Southern Tutchone (and other Dene languages), the classes of alienable and inalienable nouns are generally mutually exclusive classes, each with corresponding morphology (i.e., alienable nouns taking the alienable suffix when possessed). Saxon and Wilhelm (2016) propose that the form of the suffix taken by a given noun is lexically specified, with all surface suffix forms having the same semantics. However, in Southern Tutchone, some nouns like *chu* [tʃʰuː] 'water' can be both alienably and inalienably possessed, with the suffix form alternating with the change in meaning (126). Such alternations are not compatible with suffix shape being selected for by stems, since a stem can take multiple suffix forms.

(126) **Alternations in the possessive suffix**

a.	*chu*	[tʃʰuː]	'water'
b.	*-chū*	[tʃʰûː]	'water' (alienably possessed)
	uchū	[ʔutʃʰûː]	'my water'
c.	*-chù*	[tʃʰùː]	'water' (inalienably possessed)
	uchù	[ʔutʃʰùː]	'my water (from my body)'

An area for future research is whether such differences in the realization of the possessive suffix are due to the phase in which the suffix is spelled out, rather than there existing two underlying forms: Tyler (2020) proposed that in Mississippi Choctaw (Muskogean), inalienable possession is *n*P-internal, while alienable possession is *n*P-external (see also Alexiadou, 2003). Future work should examine whether Southern Tutchone has a single possessive suffix (a low tone) whose realization differs depending on its height of attachment in the syntax (see also Newell & Piggott, 2014; Newell et al., 2018): When the suffix merges low in the nominal structure, as in inalienable possession, the stem has not yet been spelled out (i.e., in *n*P), so it

[53] I thank Heather Goad for connecting the realizations of the suffix to previous work on the phonology-syntax interface.

replaces the stem high tone with a low tone. When the suffix merges higher in the structure, as in alienable possession, after the root has been spelled out, the stem's existing high tone is retained in addition to the low tone of the suffix, giving a surface falling tone.

An analysis along these lines predicts that the opposite tonal profile (falling as inalienable and low as alienable) should not be attested. This prediction is partially borne out: no alienable nouns take a low suffix, but some inalienable nouns take a falling suffix. However, the class of inalienable nouns is often heterogenous crosslinguistically, including nouns that are syntactically alienable but are nevertheless judged to be ungrammatical without a possessor (Nichols, 1992).

Another topic for future research concerns phonological patterns that differ in nouns and verbs. I suggest that syntactic domains may also account for some of these asymmetries. The role of /h/ in blocking assimilatory voicing of verb-initial fricatives was discussed in 4.2; specifically, post-vocalic /h/ is realized as a rising tone but also interacts with following segments. Verb-initial fricatives do not become voiced when preceded by an /h/-final (rising tone) subject prefix (127), which I attributed to /h/ blocking the spread of SV from the preceding vowel. In nouns, however, /h/-final prefixes do not block the voicing of stem-initial fricatives (128).

(127) **Stem-initial fricative voicing in verbs**

ílį	/ih-łiː-n/	[ʔǐɬį̇ː]	'I danced'
nlį	/n-łiː-n/	[n̥lį̇ː]	'you danced'

(128) **Stem-initial fricative voicing in nouns**

khal	/xaːɬ/	[xaːl]	'sled'
ǵghāl	/əh-xaːɬ-Ò/	[ʔəɣâːl]	'my sled'
nghāl	/n-xaːɬ-Ò/	[n̥ɣâːl]	'your sled'

Without referring to domains, it is unclear why allophonic voicing is blocked by /h/ in (127) but not in (128). Rice (1994, p. 143) accounted for such asymmetries by proposing that a morpheme with the feature Voice occurs between possessive prefixes and possessed nouns. However, an alternative analysis may be that subject prefixes share a domain with verb stems (as agreement), while possessive prefixes form a separate domain from noun stems (as pronouns). When /h/ is spelled out in the same domain as the stem, allophonic voicing is blocked; when /h/ is not in the same domain, the vowel is already spelled out as a vowel with rising tone (rather than a /Vh/ sequence), so it can spread SV to the following fricative.

In sum, this thesis has aimed to provide an initial step for the analysis of Southern Tutchone. Future directions include possible expansion of the proposed phonemic inventory and analysis of the phonology-syntax interface.

References

al-Aghbari, Khalsa Hamed. (2004). *Broken plurals in the Muscat dialect of Omani Arabic* [Master's thesis, University of Victoria]. UVicSpace. http://hdl.handle.net/1828/544

Alderete, John, Beckman, Jill, Benua, Laura, Gnanadesikan, Amalia, McCarthy, John, & Urbanczyk, Suzanne. (1999). Reduplication with fixed segmentism. *Linguistic Inquiry*, *30*(3), 327–364. https://doi.org/10.1162/002438999554101

Alderete, John, Blenkiron, Amber, & Edōsdi [Thompson, Judy]. (2021). Series shifts and mergers in the obstruent phonology of Tahltan (Northern Athabaskan). *Linguistic Discovery*, *17*(1), 93–109. https://doi.org/10.1349/PS1.1537-0852.A.515

Alexiadou, Artemis. (2003). Some notes on the structure of alienable and inalienable possessors. In Martine Coene & Yves D'hulst (Eds.), *From NP to DP: Vol. 2. The expression of possession in noun phrases*. John Benjamins.

Allen, Bessie, & Allen, Lorraine (Eds.). (2006). *Family and traditional Southern Tutchone stories*. Yukon Native Language Centre.

Anderson, John. (1986). Suprasegmental dependencies. In Jacques Durand (Ed.), *Dependency and non-linear phonology* (pp. 55–133). Routledge.

Avery, Peter. (1996). *The representation of voicing contrasts* (Publication No. 304323818) [Doctoral dissertation, University of Toronto]. ProQuest Dissertations & Theses Global.

Avery, Peter, & Rice, Keren. (1989). Segment structure and coronal underspecification. *Phonology*, *6*(2), 179–200. https://doi.org/10.1017/S0952675700001007

Broselow, Ellen, Huffman, Marie K., Chen, Su-I, & Hsieh, Ruohmei. (1995). The timing structure of CVVC syllables. In Mushira Eid (Ed.), *Perspectives on Arabic linguistics: Vol. 7. Papers from the seventh Annual Symposium on Arabic Linguistics* (pp. 119–138). John Benjamins Publishing Company. https://doi.org/10.1075/cilt.130.11bro

Chafe, Wallace L. (1962). Estimates regarding the present speakers of North American Indian languages. *International Journal of American Linguistics*, *28*(3), 162–171.

Cho, Young-mee Yu. (1990). *Parameters of consonantal assimilation* (Publication No. 303899784) [Doctoral dissertation, Stanford University]. ProQuest Dissertations & Theses Global.

Clements, G. N. (1985). The geometry of phonological features. *Phonology Yearbook*, *2*, 225–252. https://doi.org/10.1017/S0952675700000440

Clements, G. N. (1991). Place of articulation in consonants and vowels: A unified theory. *Working Papers of the Cornell Phonetics Laboratory*, *5*, 77–123.

Clements, G. N., & Hume, Elizabeth. (1995). The internal organization of speech sounds. In John Goldsmith (Ed.), *The handbook of phonological theory* (pp. 245–306). Blackwell Publishers.

Cook, Eung-Do. (1981). Athapaskan linguistics: Proto-Athapaskan phonology. *Annual Review of Anthropology*, *10*, 253–273. https://doi.org/10.1146/annurev.an.10.100181.001345

Crippen, James A. (2010). *Lingít yoo x̱'atángi: A grammar of the Tlingit language (draft)* [Unpublished manuscript]. Department of Linguistics, University of Hawai'i at Mānoa.

Crippen, James, Déchaine, Rose-Marie, & Elfner, Emily. (2023). Tlingit (anti-)prominence. In Ksenia Bogomolets & Harry van der Hulst (Eds.), *Word prominence in languages with complex morphologies* (pp. 178–218). Oxford University Press.

Cruikshank, Julie. (1990a). Getting the words right: Perspectives on naming and places in Athapaskan oral history. *Arctic Anthropology*, *27*(1), 52–65.

Cruikshank, Julie (Ed.). (1990b). *Life lived like a story: Life stories of three Yukon native elders*. University of Nebraska Press.

Cruikshank, Julie. (1997). Negotiating with narrative: Establishing cultural identity at the Yukon International Storytelling Festival. *American Anthropologist*, *99*(1), 56–69.

Cruikshank, Julie. (1998). *The social life of stories: Narrative and knowledge in the Yukon Territory*. University of Nebraska Press.

Davis, Stuart, & Hammond, Michael. (1995). On the status of onglides in American English. *Phonology*, *12*(2), 159–182. https://doi.org/10.1017/S0952675700002463

Donegan, Patricia Jane. (1978). *On the natural phonology of vowels* (Publication No. 302896476) [Doctoral dissertation, Ohio State University]. ProQuest Dissertations & Theses Global.

Dresher, B. Elan. (2009). *The Contrastive Hierarchy in phonology*. Cambridge University Press. https://doi.org/10.1017/CBO9780511642005

Edwards, Keri. (2009). *Dictionary of Tlingit*. Sealaska Heritage Institute.

Emonds, Joseph E. (2014). The phonological basis of Latin case patterns. *Topics in Linguistics*, *14*, 48–68. https://doi.org/10.2478/topling-2014-0011

Giergerich, Heinz J. (1992). *English phonology: An introduction*. Cambridge University Press. https://doi.org/10.1017/CBO9781139166126

Goad, Heather. (1993). *On the configuration of height features* (Publication No. 304129826) [Doctoral dissertation, University of Southern California]. ProQuest Dissertations & Theses Global.

Goad, Heather. (2002). Markedness in right-edge syllabification: Parallels across populations. *Canadian Journal of Linguistics/Revue canadienne de linguistique*, *47*(3/4), 151–186. https://doi.org/10.1017/S0008413100022933

Goad, Heather, & Rose, Yvan. (2004). Input elaboration, head faithfulness, and evidence for representation in the acquisition of left-edge clusters in West Germanic. In René Kager, Joe Pater, & Wim Zonneveld (Eds.), *Constraints in phonological acquisition* (pp. 109–157). Cambridge University Press. https://doi.org/10.1017/CBO9780511486418.005

Goad, Heather, & Travis, Lisa. (2021). Phonological evidence for morpho-syntactic structure in Athapaskan. *The Linguistic Review*, *38*(3), 349–389. https://doi.org/10.1515/tlr-2021-2070

Goldsmith, John. (1976). *Autosegmental phonology* (Publication No. 302829008) [Doctoral dissertation, Massachusetts Institute of Technology]. ProQuest Dissertations & Theses Global.

Goldsmith, John. (1990). *Autosegmental and metrical phonology*. Blackwell Publishers.

Hamann, Silke. (2003). *The phonetics and phonology of retroflexes* [Doctoral dissertation, Utrecht University]. Utrecht University Repository. https://dspace.library.uu.nl/handle/1874/627

Hansson, Gunnar Ólafur. (2010). *Consonant harmony: Long-distance interaction in phonology*. University of California Press.

Hargus, Sharon. (2010). Athabaskan phonetics and phonology. *Language and Linguistics Compass*, *4*(10), 1019–1040. https://doi.org/10.1111/j.1749-818X.2010.00245.x

Harris, John. (1994). *English sound structure*. Blackwell Publishers.

Harris, John. (1997). Licensing inheritance: An integrated theory of neutralization. *Phonology*, *14*(3), 315–370. https://doi.org/10.1017/S0952675798003479

Harris, John, Watson, Jocelynne, & Bates, Sally. (1999). Prosody and melody in vowel disorder. *Journal of Linguistics*, *35*(3), 489–525. https://doi.org/10.1017/S0022226799007902

Hayes, Bruce. (1989). Compensatory lengthening in moraic phonology. *Linguistic Inquiry*, *20*(2), 253–306.

Holton, Gary. (2000). *The phonology and morphology of the Tanacross Athabaskan language* (Publication No. 304600029) [Doctoral dissertation, University of California, Santa Barbara]. ProQuest Dissertations & Theses Global.

Hulst, Harry van der. (2016). Monovalent 'features' in phonology. *Language and Linguistics Compass*, *10*(2), 83–102. https://doi.org/10.1111/lnc3.12158

Hulst, Harry van der. (2018). *Asymmetries in vowel harmony: A representational account*. Oxford University Press. https://doi.org/10.1093/oso/9780198813576.001.0001

Hyman, Larry. (1985). *A theory of phonological weight*. Foris Publications. https://doi.org/10.1515/9783110854794

Itô, Junko. (1986). *Syllable theory in prosodic phonology* (Publication No. 303489331) [Doctoral dissertation, University of Massachusetts Amherst]. ProQuest Dissertations & Theses Global.

Itô, Junko. (1989). A prosodic theory of epenthesis. *Natural Language & Linguistic Theory*, *7*(2), 217–259. https://doi.org/10.1007/BF00138077

Jaker, Alessandro, Welch, Nicholas, & Rice, Keren. (2020). The Na-Dene languages. In Daniel Siddiqi, Michael Barrie, Carrie Gillon, Jason D. Haugen, & Éric Mathieu (Eds.), *The Routledge handbook of North American languages* (pp. 473–503). Routledge. https://doi.org/10.4324/9781315210636-20

Jakobson, Roman. (1971). *Studies on child language and aphasia*. Mouton. https://doi.org/10.1515/9783110889598

Kager, René. (1989). *A metrical theory of stress and destressing in English and Dutch* [Doctoral dissertation, Utrecht University]. Utrecht University Repository. https://dspace.library.uu.nl/handle/1874/8680

Kari, James. (1985). A note on Athapaskan directionals. *International Journal of American Linguistics*, *51*(4), 471–473. https://doi.org/10.1086/465936

Kaye, Jonathan, Lowenstamm, Jean, & Vergnaud, Jean-Roger. (1990). Constituent structure and government in phonology. *Phonology*, *7*(2), 193–231. https://doi.org/10.1017/S0952675700001184

Kingston, John. (2005). The phonetics of Athabaskan tonogenesis. In Sharon Hargus & Keren Rice (Eds.), *Athabaskan prosody* (pp. 137–184). John Benjamins Publishing Company. https://doi.org/10.1075/cilt.269.09kin

Kingston, John. (2011). Tonogenesis. In Marc van Oostendorp, Colin J. Ewen, Elizabeth Hume, & Keren Rice (Eds.), *The Blackwell companion to phonology: Vol. 4. Phonological interfaces*. John Wiley & Sons. https://doi.org/10.1002/9781444335262.wbctp0097

Klein, Marc. (1991). *Vers une approche substantielle et dynamique de la constituance syllabique: Le cas des semi-voyelles et des voyelles hautes dans les usages parisiens* [Toward a substantial and dynamic approach to syllabic constituency: The case of semivowels and high vowels in Parisian French] (Unpublished doctoral dissertation). Université Paris VIII.

Krauss, Michael E. (1964). Proto-Athapaskan-Eyak and the problem of Na-Dene: The phonology. *International Journal of American Linguistics*, *30*(2), 118–132. https://doi.org/10.1086/464766

Krauss, Michael E. (1973). Na-Dene. In Thomas Sebeok (Ed.), *Linguistics in North America* (pp. 903–908). Mouton.

Krauss, Michael E. (1981). *On the history and use of comparative Athabaskan linguistics* (Publication No. CA961K1981) Alaska Native Language Archive. https://www.uaf.edu/anla/record.php?identifier=CA961K1981

Krauss, Michael E., & Golla, Victor K. (1981). Northern Athapaskan languages. In June Helm (Ed.), *Handbook of North American Indians: Vol. 6. Subarctic* (pp. 67–85). Smithsonian Institution.

Kwanlin Dün First Nation. (2020). *Kwanlin Dün: Dä kwändur ghày ghàkwadîndur: Our story in our words*. Figure 1 Publishing.

Laver, John. (1994). *Principles of phonetics*. Cambridge University Press. https://doi.org/10.1017/CBO9781139166621

Leer, Jeff. (1979). *Proto-Athapaskan verb stem variation, part 1: Phonology*. Alaska Native Language Centre.

Leer, Jeff. (1999). Tonogenesis in Athabaskan. In Shigeti Kaji (Ed.), *Cross-linguistic studies of tonal phenomena: Tonogenesis, typology, and related topics* (pp. 37–66). Institute for the Study of Languages and Cultures of Africa and Asia, Tokyo University of Foreign Studies.

Leer, Jeff. (2005). How stress shapes the stem-suffix complex in Athabaskan. In Sharon Hargus & Keren Rice (Eds.), *Athabaskan prosody* (pp. 278–318). John Benjamins Publishing Company. https://doi.org/10.1075/cilt.269.17lee

Leer, Jeff. (2006). Na-Dene languages. In Keith Brown (Ed.), *Encyclopedia of language & linguistics* (2nd ed., pp. 428–430). Elsevier. https://doi.org/10.1016/B0-08-044854-2/02272-0

Lombardi, Linda. (1991). *Laryngeal features and laryngeal neutralization* (Publication No. 303940709) [Doctoral dissertation, University of Massachusetts Amherst]. ProQuest Dissertations & Theses Global.

Lovick, Olga. (2020). *A grammar of Upper Tanana: Vol. 1. Phonology, lexical classes, morphology*. University of Nebraska Press.

Maddieson, Ian, & Smith, Caroline L. (2013). The stops of Tlingit. In John Sylak-Glassman & Justin Spence (Eds.), *Structure and contact in languages of the Americas*. Department of Linguistics, University of California, Berkeley. https://escholarship.org/uc/item/4kz528nm

Manker, Jonathan. (2012). *An acoustic study of stem prominence in Hän Athabascan* [Master's thesis, University of Alaska Fairbanks]. Scholarworks@UA. http://hdl.handle.net/11122/8459

McCarthy, John J., & Prince, Alan. (1996). Prosodic morphology 1986. *Linguistics Department Faculty Publication Series, 13*. https://scholarworks.umass.edu/linguist_faculty_pubs/13

McCarthy, John J., & Prince, Alan. (1999). Faithfulness and identity in prosodic morphology. In René Kager, Harry van der Hulst, & Wim Zonneveld (Eds.), *The prosody-morphology interface* (pp. 269–309). Cambridge University Press.

McClellan, Catharine. (1953). The Inland Tlingit. *Memoirs of the Society for American Archaeology*, *9*, 47–52.

McClellan, Catharine (Ed.). (1970). *The girl who married the bear: A masterpiece of Indian oral tradition*. National Museums of Canada.

McClellan, Catharine. (1975a). *My old people say: An ethnographic survey of southern Yukon Territory (Vol. 1)*. National Museum of Man.

McClellan, Catharine. (1975b). *My old people say: An ethnographic survey of southern Yukon Territory (Vol. 2)*. National Museum of Man.

McClellan, Catharine. (1981). Tutchone. In June Helm (Ed.), *Handbook of North American Indians: Vol. 6. Subarctic* (pp. 493–505). Smithsonian Institution.

McClellan, Catharine (Ed.). (2007). *My old people's stories: A legacy for Yukon First Nations: Part I: Southern Tutchone narrators*. Yukon Tourism and Culture.

McDonough, Joyce M. (2019). Krauss (2005) tonogenesis tables: IPA transcription. *University of Rochester Working Papers in Language Sciences*, *7*(1), 1–8.

Mester, R. Armin, & Itô, Junko. (1989). Feature predictability and underspecification: Palatal prosody in Japanese mimetics. *Language*, *65*(2), 258–293. https://doi.org/10.2307/415333

Mithun, Marianne. (1999). *The languages of native North America*. Cambridge University Press.

Mokha, Avleen K., & Goad, Heather. (2022, April 9–10). *A structured approach to obstruent+approximant+vowel strings in Hindi* [Conference abstract]. 12th (Formal) Approaches to South Asian Languages conference, University of Utah, Salt Lake City.

Moore, Patrick, & Tlen, Daniel L. (2007). Indigenous linguistics and land claims: The semiotic projection of Athabaskan directionals in Elijah Smith's radio work. *Journal of Linguistic Anthropology*, *17*, 266–286. https://doi.org/10.1525/jlin.2007.17.2.266

Morén-Duolljá, Bruce. (2011). Vowel place. In Marc van Oostendorp, Colin J. Ewen, Elizabeth Hume, & Keren Rice (Eds.), *The Blackwell companion to phonology: Vol. 1. General issues and segmental phonology*. John Wiley & Sons. https://doi.org/10.1002/9781444335262.wbctp0019

Moseley, Christopher (Ed.). (2010). *Atlas of the world's languages in danger* (3rd ed.). UNESCO Publishing.

Myers, Scott. (1987). Vowel shortening in English. *Natural Language & Linguistic Theory*, *5*(4), 485–518. https://doi.org/10.1007/BF00138987

Nadasdy, Paul. (2012). Boundaries among kin: Sovereignty, the modern treaty process, and the rise of ethno-territorial nationalism among Yukon First Nations. *Comparative Studies in Society and History*, *54*(3), 499–532.

Ned, Annie. (2001). Our shagóon, our family history. In James Ruppert & John W. Bernet (Eds.), *Our voices: Native stories of Alaska and the Yukon* (pp. 193–197). University of Nebraska Press.

Newell, Heather. (2008). *Aspects of the morphology and phonology of phases* (Publication No. 304344364) [Doctoral dissertation, McGill University]. ProQuest Dissertations & Theses Global.

Newell, Heather, & Piggott, Glyne. (2014). Interactions at the syntax-phonology interface: Evidence from Ojibwe. *Lingua*, *150*, 332–362. https://doi.org/10.1016/j.lingua.2014.07.020

Newell, Heather, Piggott, Glyne, & Travis, Lisa. (2018). The possessive structure of Ojibwe: Support from Cupeño. *University of British Columbia Working Papers in Linguistics*, *46*, 169–184.

Nichols, Johanna. (1992). *Linguistic diversity in space and time*. The University of Chicago Press.

Odden, David. (1991). Vowel geometry. *Phonology*, *8*(2), 261–289. https://doi.org/10.1017/S0952675700001408

Oostendorp, Marc van. (1995). *Vowel quality and phonological projection* [Doctoral dissertation, Tilburg University]. Rutgers Optimality Archive. http://doi.org/10.7282/T3HX1BK6

Oostendorp, Marc van. (2003). Schwa in phonological theory. In Lisa Cheng & Rint Sybesma (Eds.), *The second Glot International state-of-the-article book: The latest in linguistics* (pp. 431–461). Mouton de Gruyter. https://doi.org/10.1515/9783110890952.431

Padgett, Jaye. (2002). Feature classes in phonology. *Language*, *78*(1), 81–110. https://doi.org/10.1353/lan.2002.0046

Piggott, Glyne. (1992). Variability in feature dependence: The case of nasality. *Natural Language & Linguistic Theory*, *10*(1), 33–77. https://doi.org/10.1007/BF00135358

Piggott, Glyne. (2003). The phonotactics of a "Prince" language: A case study. In Stefan Ploch (Ed.), *Living on the edge: 28 papers in honour of Jonathan Kaye* (pp. 401–426). Mouton de Gruyter. https://doi.org/10.1515/9783110890563.401

Prince, Alan, & Smolensky, Paul. (1993). *Optimality Theory: Constraint interaction in generative grammar* (Publication No. CU-CS-696-93). Department of Computer Science, University of Colorado at Boulder. https://scholar.colorado.edu/concern/reports/41687j32q

Pulleyblank, Douglas. (2011). Vowel height. In Marc van Oostendorp, Colin J. Ewen, Elizabeth Hume, & Keren Rice (Eds.), *The Blackwell companion to phonology: Vol. 1. General issues and segmental phonology*. John Wiley & Sons. https://doi.org/10.1002/9781444335262.wbctp0021

Rice, Keren. (1985). Noun compounds in Dene. *Journal of the Atlantic Provinces Linguistic Association*, *6/7*, 55–72.

Rice, Keren. (1989). *A grammar of Slave*. Mouton de Gruyter. https://doi.org/10.1515/9783110861822

Rice, Keren. (1992). On deriving sonority: A structural account of sonority relationships. *Phonology*, *9*(1), 61–99. https://doi.org/10.1017/S0952675700001500

Rice, Keren. (1993). A reexamination of the feature [sonorant]: The status of 'sonorant obstruents'. *Language*, *69*(2), 308–344. https://doi.org/10.2307/416536

Rice, Keren. (1994). Laryngeal features in Athapaskan languages. *Phonology*, *11*(1), 107–147. https://doi.org/10.1017/S095267570000186X

Rice, Keren. (1995). On vowel place features. *Toronto Working Papers in Linguistics*, *14*, 73–116.

Rice, Keren. (1997). A reexamination of Proto-Athabaskan *y. *Anthropological Linguistics*, *39*(3), 423–436.

Rice, Keren, & Avery, Peter. (1989). On the interaction between sonorancy and voicing. *Toronto Working Papers in Linguistics*, *10*, 65–82.

Rice, Keren, & Avery, Peter. (1991). On the relationship between laterality and coronality. In Carole Paradis & Jean-François Prunet (Eds.), *Phonetics and phonology: Vol. 2. The special status of coronals: Internal and external evidence* (pp. 101–124). Academic Press. https://doi.org/10.1016/B978-0-12-544966-3.50012-9

Rice, Keren, & Reuse, Willem de. (2017). The Athabaskan (Dene) language family. In Alexandra Aikhenvald & R. M. W. Dixon (Eds.), *The Cambridge handbook of linguistic typology* (pp. 707–746). Cambridge University Press. https://doi.org/10.1017/9781316135716.023

Ritter, John T. (1976, November 6). *A sketch of Tutchone historical phonology* [Conference presentation abstract]. Athabaskan Linguistics Conference, Calgary.

Ritter, John T. (1982). *The development of tone and retroflexion in Tutchone Athapaskan* [Unpublished manuscript]. Yukon Native Languages Project.

Ritter, John T. (1983, May 24–27). *Glottalization, aspiration, and tone in Tutchone (Yukon, Canada)* [Conference presentation handout]. Athabaskan Language Conference, University of Alaska Fairbanks.

Ryan, Joan, & Robinson, Michael P. (1990). Implementing participatory action research in the Canadian North: A case study of the Gwich'in Language and Cultural Project. *Culture*, *10*(2), 57–71. https://doi.org/10.7202/1081339ar

Sagey, Elizabeth. (1986). *The representation of features and relations in nonlinear phonology* (Publication No. 303527634) [Doctoral dissertation, Massachusetts Institute of Technology]. ProQuest Dissertations & Theses Global.

Saxon, Leslie, & Wilhelm, Andrea. (2016). The "possessed noun suffix" and possession in two Northern Dene (Athabaskan) languages. *International Journal of American Linguistics*, *82*(1), 35–70. https://doi.org/10.1086/684423

Schane, Sanford A. (1973). *Generative phonology*. Prentice-Hall.

Schane, Sanford A. (1984). The fundamentals of particle phonology. *Phonology Yearbook*, *1*, 129–155. https://doi.org/10.1017/S0952675700000324

Shaw, Patricia A. (1991). Consonant harmony systems: The special status of coronal harmony. In Carole Paradis & Jean-François Prunet (Eds.), *Phonetics and phonology: Vol. 2. The special status of coronals: Internal and external evidence* (pp. 125–157). Academic Press. https://doi.org/10.1016/B978-0-12-544966-3.50013-0

Statistics Canada. (2022). *Table 98-10-0230-01: Indigenous mother tongue, Indigenous language spoken most often at home and other Indigenous language(s) spoken regularly at home: Canada, provinces and territories*. https://doi.org/10.25318/9810023001-eng

Steriade, Donca. (1987). Redundant values. In Barbara Need, Eric Schiller, & Anna Bosch (Eds.), *Papers from the 23rd annual regional meeting of the Chicago Linguistic Society* (pp. 339–362). Chicago Linguistic Society.

Steriade, Donca. (1994). *Positional neutralization and the expression of contrast* [Unpublished manuscript]. Department of Linguistics, University of California, Los Angeles.

Tlen, Daniel L. (1986). *Speaking out: Consultations and survey of Yukon Native languages planning, visibility, and growth*. Yukon Native Language Centre.

Tlen, Daniel L. (1993). *Kluane Southern Tutchone glossary*. The Northern Research Institute.

Tlen, Daniel L. (2007a). *Southern Tutchone grammar notes on nouns* [Unpublished manuscript]. Yukon Native Language Centre.

Tlen, Daniel L. (2007b). *Southern Tutchone grammar notes on syntax* [Unpublished manuscript]. Yukon Native Language Centre.

Tlen, Daniel L. (2007c). *Southern Tutchone grammar notes on verbs* [Unpublished manuscript]. Yukon Native Language Centre.

Tlen, Daniel L. (2008a). *Southern Tutchone noun morphology* [Unpublished manuscript]. Yukon Native Language Centre.

Tlen, Daniel L. (2008b). *Southern Tutchone verbal noun morphology* [Unpublished manuscript]. Yukon Native Language Centre.

Tlen, Daniel L. (2018). *Lhù' àän mân kwänje: Guidebook for families and novice speakers of Kluane Southern Tutchone*. Kluane First Nation.

Tlen, Daniel L. (2022). *Dań k'è kwănje easy alphabet for Southern Tutchone* [Unpublished manuscript]. Yukon Native Language Centre.

Tuttle, Siri G. (2010). Syllabic obstruents in Ahtna Athabaskan. In Jan Wohlgemuth & Michael Cysouw (Eds.), *Rara & rarissima: Documenting the fringes of linguistic diversity* (pp. 341–357). De Gruyter Mouton. https://doi.org/10.1515/9783110228557.341

Tuttle, Siri G., & Hargus, Sharon. (2004). Explaining variability in affix order: The Athabaskan areal and third person prefixes. *Working Papers in Athabaskan Languages*, *4*, 70–98.

Tyler, Matthew. (2020). Two kinds of external possession in Mississippi Choctaw. *Syntax*, *24*(1), 78–122. https://doi.org/10.1111/synt.12205

Uffmann, Christian. (2011). The organization of features. In Marc van Oostendorp, Colin J. Ewen, Elizabeth Hume, & Keren Rice (Eds.), *The Blackwell companion to phonology: Vol. 1. General issues and segmental phonology*. John Wiley & Sons. https://doi.org/10.1002/9781444335262.wbctp0027

Vanstone, James W. (1982). Southern Tutchone clothing and Tlingit trade. *Arctic Anthropology*, *19*(1), 51–61.

Walsh Dickey, Laura. (1997). *The phonology of liquids* (Publication No. 304352751) [Doctoral dissertation, University of Massachusetts Amherst]. ProQuest Dissertations & Theses Global.

Workman, Margaret (Ed.). (2010). *Kwädą̄y kwändū̄r: Traditional Southern Tutchone stories*. Yukon Native Language Centre.

Yukon Native Language Centre. (1997). *Dákeyi: Our country* [CD-ROM].

Yukon Native Language Centre. (2002). *Southern Tutchone noun dictionary (first draft)*.

Yukon Native Language Centre. (2005). *Southern Tutchone literacy sessions: April 13–15, 2005*.

Yukon Native Language Centre. (2007). *Dákeyi: Our country*. https://ynlc.ca/wp-content/uploads/dakeyi/index.html

Yukon Native Language Centre. (2010). *Southern Tutchone literacy sessions 2009–2010: S. Tutchone in-service April 27–28, 2009, S. Tutchone literacy April 29–30, S. Tutchone in-service April 27–28, 2010, S. Tutchone literacy April 29–30, 2010*.

Yukon Native Language Centre. (2017). *Dákeyi teaching guide: Athapaskan language course: Southern Tutchone place names*. (Original work published 1997)

Appendix 1: Comparison of orthographies

(129) **Comparison of various Southern Tutchone orthographies**

IPA	**Adapted** (this work)	**YNLC**	**Kluane** (Tlen 1993)	**EZ** (Tlen 2018)
aː	a	a	a	a, aa
ə [ə ~ ɛ]	ä	ä, (e)	ä, ë	a, e
ɚː	är	är	är	ar
əj	äy	äy	äy, ay	äy, ay
əw	äw	äw	äw, aw	äw, aw
tʃʰ	ch	ch	ch	ch
tʃʼ	ch’	ch’	ch’	ch’
t	d	d	d	d
ttθ	ddh	ddh	ddh	ddh
ð	dh	dh	dh	dh
tɬ	dl	dl	dl	dl
ts	dz	dz	dz	dz
eː	e	e	e	e
jə [jɛ]	ë	e	e, ye	e
k	g	g	g	g
ɣ	gh	gh	gh	gh
ɣʷ	ghw	ghw	ghw	ghw
kʷ	gw	gw	gw	gw
h	h	h	h	h
iː	i	i	i	i
tʃ	j	j	j	j
kʰ	k	k	k	k
x	kh	kh	kh	kh
xʷ	khw	khw	khw	khw
kʰʷ	kw	kw	kw	kw
k’	k’	k’	k’	k’
k’ʷ	k’w	kw’	k’w	k’w
l	l	l	l	l
ɬ	ɬ	ɬ	ɬ	lh
m	m	m	m	m
ᵐb	mb	mb	mb	m
n	n	n	n	n
ⁿd	nd	nd	nd	n
ⁿdʒ	nj	nj	nj	nj
oː	o	o	o	o
s	s	s	s	s
ʃ	sh	sh	sh	sh
tʰ	t	t	t	t
θ	th	th	th	ts
tɬʰ	tl	tl	tl	tl

tɬ’	tl’	tl’	tl’	tl’
ts^h	ts	ts	ts	ts
ts’	ts’	ts’	ts’	ts’
$tθ^h$	tth	tth	tth	tth
tθ’	tth’	tth’	tth’	tth’
t’	t’	t’	t’	t’
uː	u	u	u	u
i̱ː	ü	ü	ü	uh
i̱ɾ̆ː	ür	ür	ür	ur
w	w	w	w	w
j	y	y	y	y
z	z	z	z	z
ʒ	zh	zh	zh	zh
ʔ	’	’	’	’
V́	V	V	V	V
V̀	V̀	V̀	V̀	V̀
V̌	V́	V́	V́	V́
V̂	V̄	V̄	V̄	V̂
Ṽ	V̨	V̨	V̨	V̨

Appendix 2: Stem shape table

(130) **Stem shapes in Southern Tutchone**

	CVː	**CV̨**ː	**CVn**	**CV(ː)l**	**CV(ː)tʰ**
<i>	*nji* [ⁿdʒiː] ‘food’	*tth’į* [tθ’įː] ‘mosquito’			
<u>	*chu* [tʃʰuː] ‘water’	*-tsų* [tsʰų̣ː] ‘grandmother’			
<e>	*the* [θeː] ‘belt’	*-mę*[54] [mę̣ː] ‘aunt’			
<a>	*nda* [ⁿdaː] ‘medicine’	*shą* [ʃą̣ː] ‘rain’		*khal* [xaːl] ‘sled’	*-mbat* [ᵐbaːtʰ] ‘older sister’
<ü>	*thü* [θɨː] ‘pants’				
<ë>			*khën* [xjɛn] ‘song’	*tthël* [tθʰjɛl] ‘fence’	*łët* [ɬjɛt] ‘scab’
<ä>			*män* [mən] ‘lake’	*mbäl* [ᵐbəl] ‘sleep’	*łät* [ɬətʰ] ‘smoke’
<äy>	*khäy* [xəj] ‘root’	*-mą̈y* [mą̣j] ‘aunt (same clan)’			
<äw>	*ch’äw* [tʃˀəw] ‘quill’	*gą̈w*[55] [ką̣w] ‘drum’			
<ür>	*shür* [ʃɨ̯ː] ‘inconnu’	*łų̈r* [ɬų̣̯ː] ‘dwarf birch’			
<är>	*shär* [ʃəːˤ] ‘bear’	*tl’ą̈r*[56] [tɬ’ą̣ːˤ] ‘horsefly’			

[54] Also *-mą̈y* (see table). Kinship terms are usually followed by the diminutive <-a> (Leer, 2005, p. 306).
[55] Also *gą̈̀w*.
[56] Also *tl’ų̈r*.