

Tonal Opposition in Northern and Southern Tutchone

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Abstract

This paper examines tonal opposition in two closely related Athabaskan languages, Northern and Southern Tutchone, both spoken in the Yukon Territory and Alaska. Despite their shared linguistic roots, these languages exhibit contrasting tonal systems: Northern Tutchone uses high tone as the marked category, while Southern Tutchone favours low tone. The study investigates whether this tonal divergence originated from a common ancestral development or arose independently through different phonetic inputs. Drawing on comparative phonological analysis, this research explores various hypotheses regarding tonogenesis, including shared origin with diverging outcomes, asymmetric derivation, and independent development. The paper further discusses broader patterns of tonal opposition within the Athabaskan language family and explores similar cases in other language families, suggesting that tonogenesis can lead to the development of divergent tonal systems even in closely related languages. The findings highlight the complex processes involved in the emergence of tone as a contrastive feature, contributing to our understanding of historical phonology and tonogenesis in North American Indigenous Languages.

1 Preliminary Remarks

This paper examines tonal opposition in two closely related Athabaskan languages, Northern Tutchone and Southern Tutchone. Primarily spoken in Alaska and the Yukon Territory, these are two severely endangered languages. Due to the limited availability of comprehensive grammar for either language, particularly in terms of tonal descriptions, this analysis relies on a comparative approach. It primarily draws on lexical data from publicly available dictionaries provided by the Yukon Native Language Center and phonetic reconstructions and theoretical analyses from broader Na-Dene literature. Throughout this paper, the following conventions are used: high tone is marked with an acute accent (e.g., é, k'é?), whereas low tone is marked with a grave accent (e.g., è, k'à), which is consistent with standard Tutchone orthography. Glottal stops are represented by the IPA symbol [ʔ]. Marked tone in this paper is referring to the less common or more phonologically complex tonal category in a given language, often carrying additional linguistic significance or emerging from specific historical developments (Hyman 2010). Examples from other Athabaskan languages, such as Tanacross, Dogrib, and Slavey, are cited in

their original transcriptions where available. The proto-language forms and reconstructions are based on sources including Leer (1999), Kingston (2005), and Hargus & Rice (2005).

The scope of this analysis is limited to lexical and morphological tone opposition in Tutchone and comparative data from select Athabaskan and non-Athabaskan languages where tonal opposition or markedness reversal is attested. While the exact mechanisms of tonogenesis and tonal divergence between Northern and Southern Tutchone remain unclear, several hypotheses have been proposed, each grounded in diverging patterns of glottalization, phonation, and diachronic sound change.

Unless otherwise stated, the phonological analysis in this study assumes a diachronic perspective, focused on the emergence and evolution of tone as a contrastive feature among these languages.

2 Introduction

2.1 The Athabaskan Languages

The Athabaskan–Eyak–Tlingit (AET) family, a subgroup of the Na-Dene language family, comprises a group of Indigenous languages spoken across North America. These languages share a number of typological properties, including complex templatic verbal morphology and broadly comparable segmental inventories. The Northern Athabaskan languages are distributed across northern North America, extending from the interior of Alaska to Hudson Bay, and from the Arctic Circle south to the Canada–United States border (McDonough 2008).

The AET family is generally estimated to include approximately 47 languages, although the precise number varies depending on classificatory criteria and dialect–language distinctions. Figure 1 presents an extended family tree of AET based on Goddard (1996). Subsequent work (e.g. Leer 2008) supports the inclusion of Eyak within this grouping and the exclusion of Haida, in contrast to Sapir’s (1915) earlier proposal concerning their genetic affiliation.

Within Na-Dene, Athabaskan and Eyak form a particularly close subgroup (Athabaskan–Eyak), with Tlingit constituting a coordinate branch. In this paper, AET refers to the Athabaskan–Eyak–Tlingit family as a whole. The spelling *Athabaskan* is adopted throughout for consistency, though alternative spellings have been used historically.

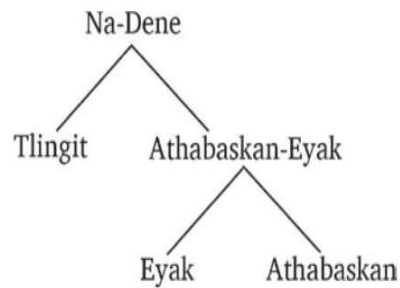


Figure 1: Na-Dene language family, based on Goddard (1996)

2.2 Northern and Southern Tutchone

Northern Tutchone and Southern Tutchone are two closely related languages which belong to the Athabaskan branch of the Na-Dene language family. They are traditionally spoken in the Yukon Territory of northwestern Canada, with some historical presence in adjacent areas of Alaska. Today, both languages are considered severely endangered, with some estimates placing the number of native or fluent speakers in the low hundreds, many of whom are elderly (Krauss 1996). The Tutchone people self-identify as part of the Dene cultural group, and their language reflects a history of oral tradition, kinship terms, and ecological knowledge. Northern Tutchone is spoken in communities such as Pelly Crossing and Mayo, and Southern Tutchone is spoken in places like Haines Junction, Burwash Landing, and Whitehorse (Yukon Native Language Centre nd).

Linguistically, both languages exhibit typical Athabaskan characteristics: complex verb morphology, templatic verb structure (although this is itself controversial), and a historically toneless proto-language. Despite these shared features, the two languages differ sharply in their tonal systems. In Northern Tutchone, high tone is the main marked tonal category, while in Southern Tutchone, low tone is marked. This leads to cases of direct tonal opposition across cognate vocabulary (Krauss 2005; Yukon Native Language Centre nd). This tonal distribution is shown in Figure 2 below, based on Krauss (1974).

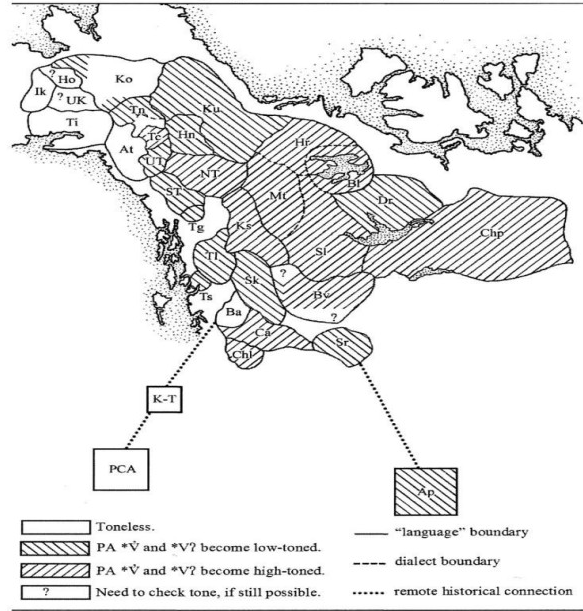


Figure 2: The Tonal Distribution Map of Northern Indigenous Languages (Krauss 1974).

According to Michael Krauss's influential language mapping work, both languages are classified as severely endangered in Alaska and the Yukon. Krauss emphasized not only the geographic spread of Athabaskan languages but also their precarious status. His map-based documentation provides a useful visual of the shrinking linguistic landscape in which Tutchone exists. The language family relationship is genealogically established, with Tutchone being a formalized member of the Northern Athabaskan subgroup. However, unlike many other Northern Athabaskan languages, Northern and Southern Tutchone present an intriguing case of tonogenesis, leading to divergent tone-marking systems. This contrast leads to the central puzzle discussed in this paper; why two closely related varieties, sharing much of their phonological and genealogical profile, have developed opposite marked tonal categories through tonogenesis.

2.3 Research Goals and Hypotheses

As mentioned above, this analysis seeks to understand the relationship between Northern and Southern Tutchone and answer the questions of how and why tonal opposition emerged between these two languages. Therefore, the overarching goal is to determine whether tonal divergence between N/S Tutchone can be traced to a shared historical development that later split, or whether the two tonal systems developed independently due to different phonetic inputs.

Due to the lack of available data, I rely on systems of related Athabaskan languages such as Slavey, Dogrib, Doig and Halfway (Dane-z aa). This approach also allows me to evaluate whether the Northern–

Southern Tutchone tonal contrast is an isolated development or part of a wider Na-Dene pattern of tonogenesis and changing tonal markedness (Tuttle 2003). Therefore, to guide this inquiry, the following hypotheses are proposed:

- i. Shared origin, diverging outcomes: Tone developed in Proto-Tutchone from glottal or laryngeal features but later split into high vs. low tone alignments in Northern and Southern Tutchone.
- ii. Asymmetric derivation: One variety (likely Northern Tutchone) developed marked tone from glottal features first, and the other reanalyzed tone oppositely, either through dialectal diffusion or structural rebalancing.
- iii. Independent tonogeneses: Northern and Southern Tutchone each developed tone independently from different glottal or phonatory cues, possibly due to local geographic or sociolinguistic factors.

In addition to these hypotheses, I pose a secondary question that investigates whether tone opposition is a recurring phenomenon elsewhere in the family and outside of it. If tonal opposition proves to be a systematic pattern, this could suggest broader implications for our understanding of tonogenesis and historical phonology in this region. These hypotheses will be explored through comparative phonological analysis, previous historical reconstructions, and the examination of phonetic environments. As of now, the answer to this question in the broader Na-Dene literature remains unclear; however, speculating about all three hypotheses is a worthy investigation.

3 Defining Tonogenesis

3.1 Broad Definitions of Tonogenesis

Tonogenesis refers to the process by which tonal contrasts- specifically, the pitch of a syllable that can alter meaning- arise from earlier non-tonal contrasts (Michaud 2020). Essentially, this means that phonological representations of tone in language allow for distinctions between two utterances. Historically, tone has been detected using the comparative method, but it can also be classified as a feature that is ongoing in a language. Thus, it is important to examine tone through both synchronic and diachronic studies.

Comparative-historical methods of detecting tonogenesis allow us to deduce the original conditioning environments that resulted in the tonal contrasts present in today's language use. While synchronic studies help us understand how the phonetic qualities of a vowel (such as height, aspiration, phonation type, etc.) affect its fundamental frequency (f_0), which can lead to reanalyses of the underlying phonological contrasts; the realization of a high tone versus a low tone (Michaud 2020). There are

numerous contrasts in a language that exhibit tonogenetic variation, such as aspirated versus unaspirated consonants, glottalized versus plain, voiced versus voiceless, etc. This signifies a significant diversity of evolutionary paths to the development of tone systems, some of which will be discussed in the sections below for Northern and Southern Tutchone.

To illustrate the process of tonogenesis, I will use a well-documented scenario found in many East Asian languages: the loss of final laryngeal consonants. Drawing on data and examples from Michaud (2020), the case of Vietnamese offers a classic example. In earlier stages of Vietnamese, syllables could end in glottal consonants such as /ʔ/ and /h/. These consonants had phonetic effects on voice, such as a creaky or breathy quality, that influenced the pitch of the syllable. Over time, as these final contrasts were lost in Vietnamese, the pitch contours they conditioned were reinterpreted as lexical tones, resulting in the development of three contrastive tones.

ta	tone	ta	tone	ta	tone
da	A	da	B	da	C

tap, tat, tak	category
dap, dat, dak	D (no tone)

Figure 3: Tone systems before the two-way split: three tones, no distinctive tone on obstruent-final syllables (Michaud 2020).

This tonal system further evolved when initial voicing distinctions in onsets, which originally marked the contrast between voiced and voiceless consonants, began to wear down. These cues weakened, and the pitch differences associated with them were reanalyzed as additional tones, which eventually gave rise to the six-tone system in modern Vietnamese.

name	description	IPA	tone numbers	example
ngang 'level'	mid level	˥	44	<i>ma</i> 'ghost'
sắc 'sharp'	high rising	˧˥	24	<i>má</i> 'cheek, mother (southern)'
huyền 'hanging'	low falling (often breathy)	˨˩˦	32	<i>mà</i> 'but'
hỏi 'asking'	mid dipping	˧˨˧	312	<i>mả</i> 'tomb, grave'
ngã 'broken'	medial glottal constriction, ends on high pitch	˧˨˥	325	<i>mã</i> 'code'
nặng 'heavy'	glottal constriction cuts short the syllable	˥˩	22	<i>mạ</i> 'rice seedling'

Figure 4: The 6-tone system of modern Vietnamese (Michaud 2020).

3.2 Tonogenesis in Athabaskan

While Vietnamese is a well-documented and relevant example of tonogenesis, I will now turn to discussions of Tonogenesis in Athabaskan languages. In many Athabaskan languages, it is attested that syllables contrast in terms of high and low tones. The historical source for these tones is likely an earlier contrast between two different syllable structures, with and without final glottalization. A pre-tonal situation is still attested in several Dene languages, providing evidence that Proto-Athabaskan was underlyingly toneless. As Michaud (2020) notes, this phonological environment, final-syllable glottalization, would typically be expected to give rise to a high tone.

This is indeed attested in the Dene languages. However, it is not exhibited in all of them. The reverse interaction, where glottal constriction is reflected in low tone, is also attested. This then presents itself as “high-marked” and “low-marked” tone languages in Dene (Kingston 2005). This is illustrated in the table below, where we see the non-tonal Proto-Athabaskan and the resulting languages that are high, low, or non-tonal.

PROTO-ATHABASKAN	HIGH MARKED		LOW MARKED		NON-TONAL	
	BEAVER	SLAVE	TSEK'ENE	SARCEE	U. KUSKOKWIM	AHTNA
*q ^w ə́n' <i>'fire'</i>	[k ^h wáɲ]	[k ^h óʔ]	[k ^h wə̀n]	[k ^h ù:ʔ]	[k ^h wə̀n']	[k ^h on']
*čá' <i>'beaver'</i>	[ts ^h áʔ]	[ts ^h áʔ]	[ts ^h àʔ]	[ts ^h àʔ]	-[ts ^h oʔ]	[ts ^h aʔ]
*-wət' <i>'belly'</i>	-[pát]	-[mpéʔ]	-[pət]	-[mìʔ]	-[mit']	-[peʔt]

Figure 5: Proto-Athabaskan historical reconstruction (Miller 2013).

In his 1999 study, Leer provided a foundational account of Athabaskan tonogenesis, demonstrating how a contrastive tone could have emerged out of a toneless Proto-Athabaskan system.

Through systematic comparisons of cognate forms and phonetic environments across daughter languages, Leer identified several laryngeal features, like glottalization, voicing, and aspiration, as key triggers in Athabaskan tonogenesis. He argues that many of the lexical tone distinctions visible in contemporary Athabaskan languages originated not as independent innovations but as phonologized pitch effects. These phonologized pitch effects were initially predictable from surrounding segmental features. For example, syllables ending in glottalized or constricted codas tended to produce a higher pitch, while those with voiced segments were associated with a lower pitch. Over time, as these segmental cues were lost or weakened, the pitch effects they conditioned became phonemic, resulting in contrastive tone systems (Leer 1999).

As Kingston (2005) clarifies, Leer’s proposition does not suggest that tone developed directly from glottalic consonants themselves. Rather, glottalic consonants introduced a distinct voice quality, which Leer termed “constriction” on the preceding vowel. It was this non-modal phonation, and not the consonant directly, that served as the phonetic precursor to marked tone. Kingston notes that even in Proto-Athabaskan, some stem nuclei were already contrasted for constriction, such as between /*Vʔ/ and /*VV/. Over time, stems with final glottalic consonants merged tonogenetically with those whose vowels were inherently constricted, creating a pathway toward marked tone. This analysis situates Athabaskan tonogenesis within a broader pattern comparable to the example provided above on Vietnamese, where segmental loss or weakening leads to the emergence of pitch-based contrasts (Kingston 2005).

Leer’s model serves as a comparative backdrop for the current study, suggesting that tonogenesis can proceed in divergent ways even within a singular language family, depending on the local phonological and, perhaps, geographic context.

Tongass Tlingit	Eyak	Pre-PA
V (short)	V (short)	V (short)
Ṿ (fading)	Vh (aspirated)	–
Vʔ (glottalized)	Vʔ (short glottalized)	Vʔ (glottalized)
V· (lengthened)	V· (long)	V· (long)
–	V·ʔ (long glottalized)	–

Figure 6: Comparative reconstruction (Leer, Jeff 1999).

4 The Case of Northern and Southern Tutchone

Among the Athabaskan languages, as mentioned above, Northern and Southern Tutchone present a particularly interesting case of tonal divergence within the same language family. While both languages descended from the same ancestral language, Proto-Athabaskan, and remain largely mutually intelligible among speakers, they exhibit a striking and systematic opposition in lexical tone markings: words that bear a high tone in Northern Tutchone often correspond to low tone cognates in Southern Tutchone, and vice versa.

This phenomenon is not merely a matter of phonetic variation or dialectal pitch preference, but rather, I argue, a consistent, contrastive pattern that affects a wide range of lexical items. As the examples below demonstrate, this reversal is repeated across numerous lexical items, specifically in the noun class, and is borrowed from the Yukon Native Language Centre's dictionaries for both languages. Additional examples are provided in Appendix A. What makes this pattern particularly noteworthy is the toneless ancestor from which both languages originated. This seems to suggest a pattern that developed in several ways, either tone developed independently in each language, or a single process of tonogenesis led to divergent outcomes. Either possibility raises significant questions about the mechanism of tonogenesis and the potential influence of geographic factors in shaping tonal systems.

(1)

a. Northern Tutchone:

tsé

'beaver'

b. Southern Tutchone:

tsà

'beaver'

(2)

a. Northern Tutchone:

té

'father'

b. Southern Tutchone:

tà

'father'

4.1 Historical Evidence for Sound Change and Plausible Explanations

As of 2025, the answer for the diverging outcomes of Northern and Southern Tutchone remains outstanding. While we see the familial resemblance of the limited data set above, which is repeated for several lexical items in their dictionaries, we cannot confirm the exact cause of the tonal opposition exhibited. We can, however, discuss the possibilities related to the hypotheses posed in the sections above.

Given that Proto-Athabaskan is reconstructed as toneless (Leer 1999), the tonal patterns in Tutchone must be the result of post-Proto sound changes, which likely involved glottalization, phonation, and pitch effects that later became phonemic. One plausible explanation is that both Northern and Southern Tutchone underwent tonogenesis under the same phonetic environments, particularly glottalic codas or voice contrast differences, but diverged in how those features were phonologized. For example, final glottal stops or laryngealized sonorants may have triggered a creaky voice, which resulted in pitch lowering in one language (in this case, it would be Southern Tutchone), while in Northern Tutchone, the same features would have been associated with a pitch raising resulting in a higher tone. As discussed below, this kind of split would be reminiscent of tonal flips observed in other Na-Dene languages, such as Dogrib or Slavey, where the same phonetic triggers yield opposite tonal reflexes, but some differences remain (Rice 2014; Saxon 2000).

As Kinston (2005) notes, glottalic consonants often do not directly result in tone but instead induce constriction on vowels, which then become pitch cues. In this view, tonal opposition may reflect a contrast in how vowel constriction was resolved phonetically instead of a contrast in segmental content. This hypothesis would phonetically resolve vowel constriction as a high tone in Northern Tutchone or a low pitch in Southern Tutchone. In view of Dene facts, Matisoff (2003) surmises that there may be two kinds of glottal stop: strong glottal constriction is associated with tension and perceptual high pitch, whereas a lapse into creaky voice is associated with relaxation, and thus, lower pitch. This implies that both Northern and Southern Tutchone developed independently during the process of tonogenesis through parallel but phonetically distinct processes.

Perhaps one of the most compelling hypotheses is that beyond phonetic conditioning, the divergence among the languages may also reflect language contact or dialectal diffusion. As suggested in Kingston (2005), geographical separation has been correlated with tonal differentiation in other Athabaskan languages. It is possible that environmental or communicative pressures favoured tonal contrast in opposite directions across dialect boundaries. The answer most likely lies in the retention of the contrast in stem-final sonorants as well as between glottalic and non-glottalic vowels in these languages down to the present day. However, Leer (1999) suggests that the high-marked languages in

Athabaskan form a tightly compact group. This could lead to speculation that this grouping represents the spread of innovation, meaning that the low-marked system is older, and that the high-marked system evolved from a low-marked system and then spread geographically. This is worth noting, as it is still speculation at this stage, much like the other hypotheses regarding these diverging outcomes.

4.2 Some Important Distinctions

While tonal opposition observed between Northern and Southern Tutchone does mirror other tonal opposition across the Athabaskan languages, it is important to distinguish such phenomena from what Jaker (2011) described as prosodic reversal in Tłı̄chʔ Yatı̄ (Dogrib). In Tłı̄chʔ, Jaker argues for the Prosodic Reversal Hypothesis, which claims that the conjunct prefix follows an iambic (weak-strong) stress pattern, with feet constructed from left to right, whereas the disjunct prefixes are trochaic, with feet constructed from right to left. As a result, certain grammatical and discourse contexts can lead to intonational reanalysis of pitch accent placement, such that the expected high tone or stressed syllable shifts to a different position within the phrase. He argues that this process is not a result of tonogenesis, but of prosodic restructuring, which is driven by syntactic, pragmatic, or morphological factors. This is occurring in a language that already has tonal features.

In contrast, the tonal opposition observed in Tutchone involves lexical tone that is contrastive at the word level and appears to be the result of historical sound changes, particularly involving glottalization and phonation. Unlike prosodic reversal, which is necessarily context-dependent and variable, Tutchone's tonal patterns are systematic and predictable across lexical items, which suggests a fundamentally phonologized tone system, although the root cause is unclear. Both phenomena (the prosodic reversal that Jaker describes and Tutchone's tonal opposition) involve changes due to pitch. However, I argue that they differ in both origin and structure. Tłı̄chʔ's prosodic reversal reflects synchronic rules for intonation, whereas it can be argued that Tutchone's tonal opposition reflects a diachronic process of phonological development. This distinction is crucial in situating the case of N/S Tutchone within the framework of tonogenesis.

5 Comparison from Within the Family

Due to the lack of data availability in these languages, exploring other low- or high-tonal opposition cases in closely related languages within the family is worthwhile.

While the tonal opposition in Northern and Southern Tutchone is striking, I argue that it is not an isolated event in the Na-Dene language family. Several other pairs of closely related languages exhibit what appear to be mirror tonal systems, in which cognates bear opposite tonal markings. Although these

cases may not involve the same mechanisms as Northern and Southern Tutchone, they provide evidence that tonal divergence may be a recurrent outcome of phonologized pitch contrasts in environments shaped by the hypotheses above.

5.1 Tłı̄chǫ (Dogrib) and Slavey

A relatively well-documented case of what appears to be tonal opposition comes from the Tłı̄chǫ (Dogrib) and Slavey languages, both of which are part of the northern Athabaskan subgroup. Saxon (2000) argues that the Proto-Athabaskan complementizer *Guʔ has two functions: an adverbial complementizer for subordinate temporal clauses and an adverb suffix, which are the most basic and perhaps most ancient uses. *Guʔ has reflexes in both languages, but it has opposing tonal outcomes. In Dogrib, the form has evolved to become a lengthened vowel bearing a marked low tone, whereas in Slavey, the reflex has become ‘gú’ with a marked high tone (Saxon 2000). This is shown in the examples below. This type of tonal reversal on a shared morpheme provides evidence for divergent tonal paths from a common source: Proto-Athabaskan. As Saxon notes in her work, these differences cannot be explained by segmental phonology alone, suggesting that a deeper cause is at play, likely due to a reorganization of phonological tone assignment between the two languages.

(3)	Slave				
	Ts'ǫ́danı	hehlı̄	gú	ʔabá	lanı̄we.
	<i>child</i>	<i>1s.be</i>	<i>GU</i>	<i>father</i>	<i>3S.pf.die</i>
	'My dad died when I was a child'				(Rice 1989:1256)

Figure 7: The function of * Guʔ in Slavey.

In Figure 8, we see that *Guʔ in Slavey functions as a complementizer, with a high-marked tone, and is presented as gú.

Saxon (2000) argues that Dogrib has a morpheme that is cognate with the form in Slavey. It has functions expected to be discovered through comparative studies, but its form in modern Dogrib is quite distinct from that of Slavey. It appears as a suffix and lacks a consonant, taking the shape of a low tone copy of the final vowel of the word to which it is affixed, as shown below.

- (9) Paul eyi dɔ goaʔj] ekò [...]
that person 3pO.3S.pf.see-GU then
- Nɔ̄htsɔ̄ ts'ò masì di.
God to thank you 3S.imp.say
 'When Paul saw those people [...] he said thanks to God'
 'At the sight of these men Paul thanked God ...'
 (LS glosses; LS translation; NIV translation)
 (Dogrib Translation Committee: Acts 28:15)

Figure 8: Modern Dogrib and the *Guʔ complementizer

However, Saxon also argues that this form is a result of language change, with its original form being /gù/ with a low tone. Emile Petitot, in the 1860s and '70s, published transcriptions of a small number of stories, together with word-by-word glosses and free translations. According to Saxon, these translations provide evidence that the morpheme at that time had the shape /gu/. Although Petitot did not analyze tone, Saxon analyzes it as a low tone in her retranscription. Due to the nature of the complementizer, it is not the same pattern as N/S Tutchone, as it is not reflected in the core lexical items, but it does suggest concrete changes in the tonogenetic process.

- (11) Ejitta ttsékhé khittcha ttsen déya
 Ezhit'à ts'èke kich'à ts'è dèya
therefore woman 3p-from to 3S.pf.leave
- la, étségu, tchon kota xhé, ...
 là, etse gù, chɔ goda xè, ...
Evid 3S.cry-GU 3S.pregnant with

Figure 9: Proposed Original Form of *Guʔ

5.2 Doig and Halfway

While Doig and Halfway are two dialects of Dane-z aa (Beaver), they exhibit a similar phenomenon to Northern and Southern Tutchone, as well as Dogrib and Slavey. According to Miller's 2021 dissertation, these varieties exhibit what she describes as mirror tonal systems. However, it is important to note that detailed lexical comparisons remain limited in publicly available data. Miller, supervised by Hargus, suggests that despite shared ancestry and geographical proximity, the two dialects have systematically opposite tone assignments for a range of vocabulary items, shown in the glossed examples below, which were embedded in carrier phrases in the actual study. Additional examples are found in Appendix B. In her research with the speakers of both dialects, she posed the question of

distinguishing features between the two dialects. Speaker commentary confirmed to her that tone was the most salient feature. According to speakers, Doig speakers were considered “low-talkers,” presumably due to the prevalence of a low-marked tone, and Halfway speakers were described as being “high talkers,” which means that their most prevalent, unmarked tone is high (Miller 2021). She suggests that these mirror systems may have arisen due to different phonological interpretations of glottalic and phonatory cues, which are possibly influenced by dialect contact phenomena. This suggests a process that could be very similar to that of Northern and Southern Tutchone, perhaps exhibiting a repeatable pattern.

(3)

Doig:

tʰás

‘arrow’

Halfway:

tʰàs

‘arrow’

(4)

Doig:

mẽ́t

‘snare’

Halfway:

mìt

‘snare’

5.3 Summary So Far

At this stage, we have seen that there are at least three examples of mirrored (oppositional) tones within the Northern Athabaskan group of AET: N/S Tutchone, Doig/Halfway, and Dogrib/Slave, while distinguishing these processes from the one described in Jaker (2011). This pattern is shown in the table below. This suggests a repeatable pattern in the Athabaskan languages. It is not random and appears to affect core lexical items in the languages, which suggests that they have arisen from shared historical conditions followed by divergent phonological developments.

Language A	Form A: High Tone	Gloss	Language B	Form B: Low Tone
Northern Tutchone	Tsé	beaver	Southern Tutchone	Tsà
Northern Tutchone	Té	father	Southern Tutchone	tà
Northern Tutchone	Kwán	matches	Southern Tutchone	kwèn
Northern Tutchone	k'éʔ	arrow	Southern Tutchone	k'à
Northern Tutchone	dek'ána	boy	Southern Tutchone	dak'ána
Doig	t ^h ás	arrow	Halfway	t ^h às
Doig	mēf	snare	Halfway	mīf
Doig	ḡ ^h áʔ	beaver	Halfway	ḡ ^h àʔ
Doig	júú	these	Halfway	jùù
Dogrib	gú (high tone)	complementizer	Slavey	gù (low tone)

Table 1: Summary of the Na-Dene language family tonal opposition pattern.

6 Outside of the Family

6.1. Zulu and Ndebele

Expanding beyond the Athabaskan family, I will now turn to language families from different regions of the world to examine whether similar patterns of tonal divergence emerge in cross-linguistic systems.

Ndebele and Zulu are genetically closely related Nguni languages spoken in Botswana, Zimbabwe, and South Africa, excluding populations in the diaspora. Northern Ndebele is often considered a dialect of the Zulu language. They share a high degree of lexical similarity, although they still retain some differences due to historical influences and language contact. The two languages share over 85% of their lexicon, with enough similarity that it is postulated (although still unconfirmed) that they both derive from a Proto-Zulu parent language spoken in Zululand before 1822 (Rycroft 1980). Much like the Athabaskan language family, there is a lack of reliable linguistic evidence from this period, which hinders the use of reliable comparative methods and reconstruction.

Rycroft (1980) notes that Ndebele has undergone significant changes in tone assignment. This is likely due to the Ndebele, who asserted their independence in 1822 and broke away from the Zulu, rather than the other way around. Thus, Ndebele has changed, while Zulu has (largely) not. Ndebele systematically favours an initial high tone in nouns, which is contrary to most other Nguni languages,

including Zulu, which typically assign either a high or no tone in that position, as shown in Figure 12. Moreover, Ndebele appears to favor avoiding phrase-final H tones (often realized as final H deletion), with the result that the tonal system becomes restructured. As Rycroft explains,

“This presents certain classificatory problems if one attempts to deal with Ndebele tone-patterns synchronically, without considering their Zulu counterparts.” (Rycroft 1980).

This underscores a key insight: tonal systems may not only diverge in the phonetic realizations of lexical items, but also in how marked tone is assigned. This creates mirror-like patterns across dialects and closely related languages. Just as in the Athabaskan examples explained above, languages with shared genetic ancestry can have pitch distinctions that move in opposite directions.

<p>ZULU <i>abántu</i> <i>abántwana</i> <i>abantwányana</i></p>	<p>----- NDEBELE <i>ábántu</i> <i>ábántwana</i> <i>ábántwányana</i></p>	<p>(people) (children) (small children)</p>
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Figure 10: Ndebele nouns have initial high tones where their Zulu cognates have low tones (Rycroft 1980).

6.2 Evidence in East-Asian Languages

As a comparative baseline for the Athabaskan case, I next consider evidence from a different region of the world. The Kammu dialects of the Mon-Khmer language, spoken in Laos and Thailand, offer a striking example of diverging tonogenesis from shared genetic origins. Some dialects of this language have developed a tonal contrast which corresponds to a contrast between voiced and voiceless initial consonants in other dialects. Thus, Kammu is a language in which the process of acquiring tones is still ongoing (Svantesson 2003). Eastern Kammu is non-tonal and has retained original voicing contrasts.

In Northern and Western Kammu, syllables with original voicing contrasts have developed high and low tones, respectively. In Northern Kammu, a high-low tone contrast has replaced the voiceless-voiced contrast. In Western Kammu, voiced stops have become aspirated voiceless, which contrast both segmentally and tonally with original unaspirated voiceless stops, which are retained as such in all dialects. The original aspirates did not change, and gave rise to a high tone in Northern and Western Kammu. Thus, Northern Kammu words have a tone contrast if they begin with a sonorant or a voiceless unaspirated stop. In contrast, words with an aspirated stop always have a high tone. For Western Kammu, words beginning with sonorants or aspirated stops have contrasting tones, but those with a voiceless

unaspirated stop always have a high tone. The situation is illustrated by the words in (13) (Svantesson 2006).

(1) *Words illustrating Kammu tonogenesis*

<i>Eastern</i>	<i>Northern</i>	<i>Western</i>	
taan̩	táan̩	táan̩	‘pack’
daan̩	tàan̩	t ^h áan̩	‘lizard’
t ^h aan̩	t ^h áan̩	t ^h áan̩	‘to clear’
raan̩	ráan̩	ráan̩	‘tooth’
raan̩	ràan̩	ràan̩	‘flower’

Figure 11: Tonogenesis in Kammu (Svantesson 2006).

While this is not exactly the case of Northern and Southern Tutchone, it is a good representation of how cognate forms can carry opposing tonal values depending on the dialect. In both cases, tonogenesis proceeds from common phonetic triggers, likely changes in glottalization or voicing contrasts, but the final phonologization has diverged. This suggests that marked tone is flexible, not only in Athabaskan but also in languages outside the family.

7 Discussion

The phenomenon in Northern and Southern Tutchone challenges conventional models of tonogenesis, which assume a uniform mapping from phonetic triggers to consistent and predictable outcomes. However, we note that in Athabaskan languages, as well as in languages outside the family, we find that identical (or nearly identical) historical pressures on tonogenesis have led to divergent tonal realizations. This is represented in Northern and Southern Tutchone, Dogrib, Slavey, Halfway, and Doig within the family. Considering both factors within the languages and the cross-linguistic aspects, this opposition does not appear to be an accident. It suggests a deeper phonological restructuring, where tone is assigned differently during the process of phonologization.

The broader comparison with languages from outside the Athabaskan family strengthens this interpretation. The Kammu dialects and tonal variation in Nguni languages demonstrate that tonal opposition can and does appear independently in other language families, from similar sources. This cross-linguistic parallel supports the assumption that tonogenesis is sensitive to interpretation and reorganization, rather than being a singular, bound process. A table summarizing all the exhibited cross-linguistic data, organized by marked tone, can be found in Appendix C.

However, this analysis remains preliminary in several aspects. The historical phonology of Tutchone is not fully reconstructed and cannot be at the present time. Existing descriptions of either language are often fragmentary. The hypotheses proposed, particularly regarding the role of glottalic consonants and constriction, require further phonetic documentation or experimental phonology to validate these claims. While it is an interesting hypothesis and entirely theoretically plausible, it is unclear to what extent language contact or geographical diffusion have influenced the divergent tonal developments across dialect boundaries. A remaining factor has been unmentioned so far: Northern and Southern Tutchone remain mutually intelligible to speakers. Thus, tone is not the distinguishing, or most salient feature between these languages.

Future research in this field should aim to collect comparative lexical and acoustic data from remaining Northern and Southern Tutchone speakers, conduct studies on phonation types, particularly regarding glottalized vowels and final segments, and examine the sociolinguistic dynamics that may have driven divergence.

8 Conclusion

This paper has explored the phenomenon of tonal opposition in Northern and Southern Tutchone, situating it within the context of tonogenesis and oppositional patterns across Athabaskan and other language families. Through preliminary comparative analysis, it becomes clear that tonal opposition between the two Tutchones is not an isolated event, but part of a repeatable pattern. These examples demonstrate that tonogenesis is not a linear process, but instead may be impacted by several factors, some of which remain unclear. Ultimately, the case of Northern and Southern Tutchone contributes to a body of evidence that mirror tonal systems are not only plausible, but a recurrent outcome of tonogenesis. It highlights the importance of looking beyond individual languages to identify cross-linguistic patterns and reinforces the idea that shared genealogy can lead to different phonological outcomes.

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Appendix A: Glossed Examples in Northern and Southern Tutchone

(5)

Northern Tutchone:

Kwán

‘matches’

Southern Tutchone:

kwèn

‘matches’

(6)

Northern Tutchone:

k'éʔ

‘arrow’

Southern Tutchone:

k'à

‘arrow’

(7)

Northern Tutchone:

dek'ána

‘boy’

Southern Tutchone:

dak'àna

‘boy’

Appendix B: Glossed example of tonal opposition in Doig/Halfway

(8)

Doig:

tsʰá?

beaver

Halfway:

tsʰà?

beaver

(9)

Doig:

júú

these

Halfway:

jùù

these

Appendix C: Summary organized by marked tone

High-Tone Language	Form (High Tone)	Low-Tone Language	Form (Low Tone)	Gloss
None	Tsé	Northern Tutchone	Tsà	beaver
None	Té	Northern Tutchone	tà	father
None	Kwán	Northern Tutchone	kwèn	matches
Northern Tutchone	k'éʔ	Southern Tutchone	k'à	arrow
None	dek'ána	Northern Tutchone	dak'àna	boy
None	t ^h ás	Doig	t ^h às	arrow
Doig	měf	Halfway	mif	snare
None	ts ^h áʔ	Doig	ts ^h àʔ	beaver
None	júú	Doig	jùù	these
None	gù (low tone)	Dogrib	gú (high tone)	complementizer
Zulu	umúntu	Ndebele	úmuntu	person
None	ikhómu	Zulu	íkhomu	cow
None	ba (voiced)	Eastern Kammu	bá (tone)	father
None	pa (voiceless)	Eastern Kammu	pà (tone)	father