A Siberian link with Na-Dene languages[1]

Edward Vajda (Western Washington University)

1. *Introduction*

The Yeniseic (Yeniseian) microfamily of central Siberia (upper and middle reaches of the Yenisei River basin) is genetically unrelated to other families of the Old World. Yeniseic includes the extinct Kott, Assan, Arin, Pumpokol, and Yugh languages, as well as the highly endangered Ket, now with fewer than 200 speakers, most over the age of 50. Only Ket and Yugh were documented in modern times. Fortunately, excellent materials were collected from the last Kott speakers by Finnish linguist M. A. Castrén (1858). Assan, Arin and Pumpokol disappeared before 1800 and were only sparsely documented by travelers and explorers. Nevertheless, the extant documentation offers valuable lexical comparanda that testify eloquently to the value of documenting even the most obscure of the world's endangered languages before they disappear. Werner (2005) contains a complete description of all 18th century documentation of Yeniseic languages. Monograph-length descriptions of Modern Ket phonology and grammar include Werner (1997), Vajda (2004), and Georg (2007).

The prefixing verb structure of Ket differs strikingly from the surrounding Uralic, Turkic, Mongolic, and Tungusic languages of Inner Asia and Siberia. During the past two centuries, linguists have attempted to link Yeniseic to other Northern Hemisphere families with a prefixing verb, notably Burushaski, Abkhaz-Adygh (Northwest Caucasian), Nakh-Dagestanian (Northeast Caucasian), Sumerian, and Na-Dene (Athabaskan-Eyak-Tlingit). It is no exaggeration to say that the position of Ket in Inner Eurasia has up until now remained as enigmatic as that of Basque in Europe, Zuni is the American Southwest, or Burushaski in South Asia.

The full history of published and unpublished speculation on the external relations of Yeniseic can be found in Vajda (2001). The earliest suggestion that Ket has a special historical connection with Native American languages dates back to Adriaan Reeland in 1708 (cf. Vajda 2001:2). The first person to claim a genetic link specifically between Yeniseic and Athabaskan-Tlingit (Eyak was then unrecognized as a Na-Dene language) was the Italian linguist Alfredo Trombetti (1923). Since that time, many other linguists, notably Merritt Ruhlen (1998) have repeated the same suggestion, though typically including Haida in Na-Dene). No one has produced anything to support this claim beyond random look-alike words or general typological resemblances. The typical inclusion of

[1] I thank Jim Kari, Mike Krauss, and Jeff Leer for valuable comments on earlier drafts. More generally, I owe a deep debt of gratitude to my Athabaskanist colleagues, without whose decades of contribution to Na-Dene historical linguistics it would hardly be possible to undertake the comparisons I am attempting here. I own a similar debt to Siberian Ketologists, particularly the indefatigable Heinrich Werner, for their crucial documentation of Yeniseic dialects and languages. Werner's work on the now extinct Yugh is similar in importance to that of Michael Krauss on Eyak, Jeff Leer on Tlingit, or Jim Kari on Ahtna. I deeply thank Bernard Comrie, director of the Linguistics Divison of the Max Planck Institute for Evolutionary Anthropology, Leipzig, for his extensive support and particularly for hosting the Na-Dene Workshop in August, 2006, where some of these ideas were first publicly presented; and I thank our colleagues at Leipzig, particularly Juliette Blevins and Don Stilo, as well as Eric Hamp, for their enthusiasm and encouragement in support of my work. I also thank all of my colleagues from Tomsk Pedagogical University, where I began my serious work on Ket. Finally, I especially thank Jim Kari and his colleagues at the University of Alaska, Fairbanks, for organizing the Dene-Yeniseic Symposium (Feb. 2008), for which this article was prepared. See also the postscript at the end of this article.

Haida in such linkages is indicative of their extremely speculative nature, as there is no demonstrable genetic relationship between Haida and Na-Dene. But if speculation counts as discovery, then the beginnings of "Dene-Yeniseic" linguistics belong to Trombetti, whose initial conclusion has proven to be completely correct[2].

Random similarities in basic vocabulary are insufficient to demonstrate language relatedness. A list of look-alike words can be compiled, even using basic vocabulary, between any human languages. Nor are typological similarities, even involving relatively uncommon traits such as a rigid prefixing verb structure, a reliable diagnostic for genetic relatedness in the absence of a system of cognate morphology. The only accepted way of demonstrating the existence of a language family is to identify a sufficient number of cognates in basic vocabulary to establish interlocking sound correspondences that are reflected in the language's grammatical systems, as well; cf. Campbell (1997) for a thorough, state-of-the-art treatment on the issue of demonstrating genetic relatedness. All accepted language families share this combination of homologies to an extent that permits at least partial phonological and morphological reconstruction of an ancestral proto-language. Though generally not stressed by historical linguists, true evidence of genetic relationship also provides, by default, external comparative data useful for tracing the internal historical development of each member language or group of languages. Word lists or typological comparisons cannot be used in this way. A linguistic debate about Haida's membership in Na-Dene is no more useful to veterinary science than a debate about whether unicorns exist. Haida comparisons have failed to shed any light whatsoever on the historical development of Athabaskan-Eyak-Tlingit, outside the realm of contact phenomena. The same could be said of the still undemonstrated Altaic Hypothesis, which is useless for understanding the internal structure of Modern Halh Mongolian. A Slavic linguist who refuses to accept Indo-European, on the other hand, would be more like a traveler who denies the existence of the automobile. Many facets of Slavic linguistic prehistory simply cannot be fully appraised without acknowledging the demonstrable relationship of Slavic to Baltic, Latin, Iranic, and its other Indo-European relatives. The unavoidable usefulness of a proven genetic connection between languages is the best confirmation of its validity.

If Yeniseic is demonstrably relatable to Na-Dene, the evidence should be able to help solve Na-Dene internal problems by providing hitherto unknown external

---

[2] In this paper I have endeavored to credit other scholars for contributions to what could be called "Dene-Yeniseic" studies. Although I reject conclusions of genetic relationship made solely on the basis of look-alike vocabulary or typological resemblances, four earlier publications should be mentioned here. Alfredo Trombetti (1923), the first to suggest the connection, may also have proposed the first Dene-Yeniseic cognate: Ket *de'ŋ* and Athabaskan *dine* 'people' (though cf 3.3.4). Merritt Ruhlen's (1998) proposed cognate sets contain several genuine cognates, among over 75% coincidental look-alikes. These are Ruhlen's comparisons for: head, stone, foot, breast, shoulder/arm, birch/birchbark, old, and burn/cook, and possibly a few others. The correct identification of cognate words for "birch/birchbark" is particularly noteworthy, as this basic vocabulary item is specific to families of the northern latitudes. The finding of these cognates, though it was impossible to confirm them as such in the absence of much more investigation, represents an important contribution, in retrospect. Also important here is Johanna Nichols' (1992) *Linguistic diversity in space and time*, which offered an innovative typological/geographical perspective on where to look for possible genetic links. In the same vain, Michael Fortescue's (1998) pioneering book *Language relations across Bering Strait* is significant for offering a preliminary inventory of unusual morphological features shared by Yeniseic and Na-Dene, but not by other Northern Hemisphere languages.

comparative data. Similarly, Na-Dene comparanda should provide answers to questions in the development of Yeniseic languages that defy resolution based on Yeniseic-internal data alone. One of the main aims of this article is to demonstrate that this is indeed the case - first by examining the prefixing verb morphology of both families, then moving on to explain systematic sound correspondences based on the cognate vocabulary.

The Yeniseic verb complex shows a striking system of morphological homologies with the oldest layer of Athabaskan-Eyak-Tlingit verb prefixes. Section 2 begins by demonstrating that Yeniseic verb morphology does not resemble other Old World prefixing languages. Section 2.2 provides an overview of specific morphological homologies between Yeniseic and Athabaskan, Eyak, and Tlingit. Successive subsections describe homologies in tense/mood/aspect affixes (2.2.1), spatial prefixes and incorporated body part nouns (2.2.2), pronominal elements (2.2.3) and in the pre-root "classifier" prefixes (2.2.4). Section 3 discusses cognates in basic vocabulary and the system of sound correspondences they reveal. This section begins with patterns of coda reduction (3.1) and the emergence of phonemic tone in three types of Yeniseic syllables (3.2 – 3.5), then turns to onset correspondences (3.6). Section 4 briefly summarizes the evidence that Yeniseic and Na-Dene share a common linguistic origin. The value of the comparanda in helping understand the historical development of both Yeniseic and Na-Dene will be highlighted along the way. My conclusion is that this body of data offers the first meaningful indication of a genetic relationship between the two language families and also proves that Na-Dene and Haida cannot possibly form a genetic unit.

In the sections that follow, I will make extensive use of the Proto-Na-Dene (PND), Proto-Athabaskan-Eyak (PAE) and Proto-Athabaskan (PA) reconstructions that have been worked out over many decades. The symbol ~ before a reconstructed proto-form indicates that the author regards it as approximate; this is generally the case with Leer's (2008) reconstructions linking Tlingit with Athabaskan-Eyak. I will not, however, generally attempt to offer Proto-Yeniseic forms, which have not yet been worked out systematically; in fact, at present we still lack a firm reconstruction of the basic Proto-Yeniseic sound inventory. Instead, I will use cognate forms in the attested Yeniseic daughter languages to illustrate the points I am trying to make.

2. *Verb affixes and pronominal elements*

2.1. *Verb prefixes, typology, and genetic linguistics*

This section compares verb structure in a number of geographically disparate language families, including Yeniseic and Na-Dene, noted for possessing a rigid series of verb prefixal classes. It will be shown that a wide variety exists in the types of prefixing verb structures found throughout the world, with Yeniseic and Na-Dene sharing a unique core of morphological traits. It will be argued that this set of homologies is not due to typology or coincidence but rather derives from a common genetic origin. The notion that Yeniseic shows any special linguistic affinity to Southern Eurasia is not born out by the details of its verb structure.

Yeniseic languages are famous for having a strongly prefixing verb in an area of the world dominated by suffixation. The Modern Ket verb template is shown in Table 1.

Table 1. Modern Ket verb structure

P8	P7	P6	P5	P4	P3	P2	P1	P0	suffix
new subj. person agr clitic	incor-porated noun or adj. root, or new verb base	obj agr.	thematic con-sonants	tense/mood marker (*s* or *ɣa*)	inanimate marker *b*	tense/mood/ aspect consonant (*l* or *n*)	old 1p, 2p subject agr	**verb base**	animate subject plural

Vajda (2007) shows that the Modern Ket verb innovated a new lexical root position toward the left of the verb complex (position 7) in imitation of the suffixing languages spoken around it. The new position 8 subject markers in Modern Ket are clitics rather than true prefixes and often encliticize to the preceding word rather than attaching to the verb form itself. All productive patterns of Ket verbs thus begin phonologically with a lexical root, in much the same way as the neighboring Samoyedic, Turkic and Tungusic languages. The oldest layer of verbs, however, is invariably prefixing and root-final, as is the case in all documented Yeniseic languages.

Comparison with verbs from extinct Yeniseic languages shown that the Modern Ket verb grew out of the structural model shown in Table 2.

Table 2. The Proto-Yeniseic verb complex

morphemes outside the phonological verb	P4	P3	P2	P1	**verb base**
verbal complements (adverb, object NP, etc.)	shape prefix, incorporated body part noun	animacy classifier *d* - anim. *b* - inan.	tense, mood, aspect (combination of two markers) (*s* or *ɣa*) + (*l* or *n*)	subject agreement (1 or 2 p) or stative resultative prefix	

The prefixing structures of both Modern Ket and Proto-Yeniseic are quite different from other prefixing verbs of the Old World. Below are verb templates from three languages (Sumerian, Burushaski and Abkhaz) that have sometimes been linked to Yeniseic as part of previous speculations about the family's external genetic connections.

Table 3. Sumerian verb structure (based on Rubio 2007: 1139)

modal prefixes	connective prefix (possibly meaning 'also, 'then')	conjugation (tense/aspect) prefixes	dative (indirect object pronominal agreement)	dimensional prefixes (locative, ablative, etc.)	2, 3p agreement (non-agent)	**root**	pronominal suffixes (agent agreement)

Table 4. Burushaski verb structure (based on Tikkanen 1995:91)

neg-ative	d-thematic prefix	person/ number/ class agr. prefix	causative, benefactive	**root**	distrib-utive pl. subject/ action suffix	1p subject agr. suffix	dur-ative non past	optative, participle, converb, infinitive	2,3p or plural subject agr. suffix	inter-rogative

Table 5. Partial template of Abkhaz verb affixes, based on examples in Hewitt (1979)

direct obj prefix	indirect obj. prefix	subject prefix	caus-ative	**root**	Suffixes expressing: negation, tense/mood/aspect, stative/dynamic, finite/non-finite verb form

The simple presence of an unusual typological feature, such as prefixes arranged in a rigid series of position classes, does not by itself indicate genetic relationship. To further illustrate how fundamentally different templatic prefixing languages can be from one another, Table 6 shows another well-known prefixing position-class verb, that of Bantu. The interdigitation of pronominal and tense/mood/aspect prefixes in Bantu, though likewise completely distinct from either Yeniseic or Na-Dene, is nevertheless closer to both typologically than either is to the other prefixing languages of Eurasia or the Americas.

Table 6. Ha (Bantu, Tanzania) verb morphology (Harjula 2004:86)

locative clitic	TAM	subject prefix	several slots for TAM distinctions	object prefix	**root**	derivational suffix	TAM	locative clitic

As can be seen, prefixing verb morphologies are by no means monolithic typologically. Yeniseic no more belongs to the southern Eurasian typological area than it does to Africa.

The next section demonstrates that, among the world's prefixing verb systems, the affinity shared by Yeniseic and Na-Dene goes far beyond mere typology, extending to intricate specific systems of morphological homologies.

2.2. *Na-Dene and Yeniseic prefixal verb morphology compared*

All Na-Dene languages likewise have a strongly prefixing verb structure. This is one of the morphological hallmarks of the family that distinguishes it from other New World families. Other North American languages with strongly prefixing verbs, such as Algonqian and Caddoan (Melnar 2004), show a completely different arrangement of prefixes. These and other prefixing languages in the New World are as different from Athabaskan, Eyak and Tlingit as the prefixing languages of southern Eurasia are from Ket. Modern Navajo verb structure, shown in Table 7, provides an illustration of the type of prefixation found in Na-Dene languages.

Table 7. Position classes in the Modern Navajo verb

(for published descriptions, with right-to-left numbering, cf. Young & Morgan 1987:37-8, and Young 2000:18-26)

10	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**+**	**2**	**1**	**0**
"outer objects" (incorporated postpositional construction, indirect obj. reciprocal, etc.	iter-ative prefix	outer lexical prefixes	distrib-utive plural /da/ (more than 2)	direct object	3rd person subject	inner prefixes (shape prefixes, etc.)	"conjugation" prefix relating to tense/mood/ aspect (*si, ni, yi*)		1st, 2nd subject	"classifier" (=valence change prefix) ɬ, d l, Ø	**verb stem** = set of root + suffix allomorphs expressing tense, mood, aspect
disjunct prefixes				**conjunct prefixes**			**conjugation+subject**			**classifier + stem**	

While a full reconstruction of the Proto-Athabaskan verb has yet to be published, the generalized Athabaskan verb model in Table 8 shows the probable structure out of which Modern Navajo developed. This model, shorn of much of the modern Athabaskan exuberance of the more recently developed disjunct (leftmost) zone of prefixes, shares essentially the same core structure with Eyak (Table 9) and Tlingit (Table 10). Note that all three tables represent my generalizations based on information from Krauss (1965, 1969), Kari (1976) and Leer (1991, 2000) and are not true reconstructions. There exists no published reconstruction of the Proto-Athabaskan verb, let alone of Proto-Na-Dene.

Table 8. Generalized Athabaskan model showing oldest prefix zones

derivational or thematic prefixes of various sorts	oldest prefix positions						**verb stem** (root + TAM suffix)
	pronominal prefixes	spatial prefixes, including **n* –round **d* –long **qʊ* –area	tense/mood/ aspect marker **s(ə), *ɢə, *nə*	speech-act-participant subject agreement	per-fective /stative prefix *ñi*	class -ifier *ɬ, d l, Ø*	

Table 9. Eyak verb (based on Krauss 1965)

derivational or thematic prefixes of various sorts	oldest prefix positions							**verb stem** (root + TAM suffix)
	object agree-ment prefix	shape/anatom -ical prefixes (from incorporated body part nouns), and other elements	tense/mood/ aspect *ɢə* (prefix *s(ə)* has moved to the right of the subject prefixes)	1sg, 2sg, 2pl subject agree-ment	tense/ mood prefix *s(ə)*	stat-ive *yi*	classifier (*i* from assimilatory effect of stative prefix) *ɬə ~ ɬi də ~ di ɬ, Ø*	

Table 10. Tlingit verb (based on Leer 1991)

derivational or thematic prefixes of various sorts	oldest prefix positions					**verb stem** (root + TAM suffix)
	object agr. prefix	incorpor ated nouns	tense/mood/aspect *ɢə, ɯu* (*ɯu* is cognate with Athabaskan-Eyak *s(ə)*	subject agreement (1 or 2 p)	classifier (*i* from old stative prefix) *ɬə ~ ɬi də ~ di sə ~ si,* etc.	

The oldest morphological layers of the Athabaskan, Eyak and Tlingit verb are strikingly similar. The verb complex is headed by a syllable consisting of a lexical root modified by ancient tense/mood/aspect suffixes. This is preceded by what is commonly called a "classifier" - a prefix that in the modern languages usually expresses differences in valence, but also retains idiosyncratic derivational uses that point to the ultimate origin of these morphemes. The 1st and 2nd person subject agreement morphemes appear in the same morpheme position in all three templates. The basic tense/mood/aspect prefixes and suffixes are cognate and likewise occupy homologous positions in all three templates with only two minor adjustments. In Eyak the prefix *s* has migrated forward to occupy a position between the subject markers and the classifiers (Krauss 1965). The perfective/stative prefix found in Proto-Athabaskan between the subject prefixes and the

classifiers has in Eyak and Tlingit transferred its expression through progressive vowel assimilation to the classifier, so that it generally no longer appears as a separate morpheme position between the subject and the classifier. Some of the spatial/shape prefixes to the left of the tense/mood/aspect markers in Athabaskan have clear cognates among the Eyak and Tlingit incorporated nouns in the same position.

These striking homologies provide a strong indication of the genetic connection between Athabaskan-Eyak-Tlingit (henceforward simply "Na-Dene"). Recent research by Leer (cf. especially Leer 2008) has proven beyond doubt the genetic connect of Tlingit to Athabaskan-Eyak by uncovering extensive sound correspondences in cognate vocabulary as well as in verb morphology. The characteristic system of Na-Dene verb affixation is unknown elsewhere in the Americas. Other New World prefixing languages are completely different from the Na-Dene model. So are suffixing languages such as Haida, an isolate that shows no more promise of being genetically linked to Na-Dene than does any other North American family.

Returning to Yeniseic, which in both its modern and proto forms differs greatly from other Old World prefixing verb structures, it can be demonstrated that the oldest morphological strata in the Yeniseic verb strongly resemble Na-Dene in many respects. This core similarity is only superficially obscured in Modern Ket by morphological fusion and by the later addition of new valence positions and incorporated elements on the left (cf. Table 1 above for a position-class model of the Modern Ket verb).

Table 11. Pre-Proto-Yeniseic verb morphology

	prefix positions						**verb base**	
obj. agr. (pro-clitic or separate word)	incorporated body-part noun, spatial prefixes, including *n* –round *d* –long *h* –flat area	animacy classifier and 3p agreement marker *d* - anim. *b* - inan.	tense, mood, aspect combination AUX + suffix		1p, 2p subj. agree-ment	stative result-ative prefix *(y)ə*	verb-deriving prefix (*d*)	root
			si, ɣa	*l, n*				

The prefixal classes and functions shared by Yeniseic and Na-Dene are as follows. Spatial prefixes, at least some of which are clearly derived from incorporated body part nouns, precede tense/mood/aspect prefixes that ultimately originated as auxiliary verbs. These TAM prefixes are followed by pronominal elements expressing agreement with a speech-act-participant subject. These subject prefixes are followed by a perfective/stative, or stative/resultative prefix. To the right of this prefix appears the verb base itself, the main lexical component. The base may be a bare root, but can be augmented by a verb-deriving prefix consisting of *d* or possibly a sound with reflexes *l*, *χ*, *q* across the daughter languages, suggesting the velar approximant *ɯ̨* as its proto-form. These similarities go far beyond typological coincidence. Not only is the basic interdigitation of morpheme classes extremely close, the system of morpheme shapes occupying each position class appear cognate in many instances. The next several subsections explore Dene-Yeniseic homologies in the expression of tense/mood/aspect (2.2.1), shape-prefixes (2.2.2), pronominal elements (2.2.4), and pre-root verb deriving prefixes (2.2.3).

2.2.1 *The Dene-Yeniseic tense/mood/aspect system*

The similarities in Yeniseic and Na-Dene verb structure are actually more intricate and precise than cursory inspection suggests. To understand them as a system, it is best to start with the proposal that the core Yeniseic and Na-Dene verb strings as they exist today both likely derived from a bipartite combination of auxiliary verb plus root verb. Leer's (2000) article on Na-Dene negative and irrealis morphology already suggested that at least some TAM affixes originated as auxiliaries. McDonough (2000) observed that the modern Athabaskan verb still maintains this bipartite functional arrangement to a significant degree. The same is true of Modern Ket verb morphology, where finite verb forms minimally consist of two syllables – one deriving from an old auxiliary, the other being the lexical verb root. In both families, peg (semantically empty) prefixes are used to supply the minimum requirement of two syllables and two morphemes in cases where a finite verb form would be monosyllabic. In the prehistory of both languages families, each of these two elements – auxiliary and main verb – represented a complex capable of containing its own prefixes and suffixes. This is most clearly demonstrated by the fact that TAM categories were expressed through the choice of auxiliary (tense/mood prefix) as well as by a suffix. This arrangement has persisted in all modern Yeniseic and Na-Dene languages with the difference that in Na-Dene the TAM suffixes attach to the lexical verb root, while in Yeniseic the same suffixes attach to the auxiliary.

Table 11. Probable bipartite verb structure in pre-proto-Yeniseic and Na-Dene with different positions of TAM suffixes

	auxiliary complex	***root complex***
Na-Dene		
	(spatial or pronominal prefix)-**AUX**	(classifier)-root+**TAMsuffix**
	*x^{y}(ə),*Gə	main verb + *ɬ, *ñ , etc.
Yeniseic		
	(spatial or pronominal prefix)-**AUX+TAMsuffix**	(prefix)-verb base
	s, ɣa + l or n	main verb

The set of TAM prefixes (from the old auxiliaries) as well as the suffixes are cognate in the two language families. Table 12, using modern Ket and Navajo forms alongside the Eyak and Tlingit proto-forms proposed in Leer (2000) illustrates how the auxiliary verb forms yielded cognates in the modern languages.

Table 12. Cognate Yeniseic and Na-Dene TAM prefixes with their probable meanings

original auxiliary	Ket	Navajo	Eyak	Tlingit
*x^{y}(ə) (telic?)	s(i)	si	s	ɯqu
*Ga (non-telic?)	ɣa	yi (< ɣi)	Gə	Ga

Leer (2008:25) identified the consonant of the Athabaskan *si*-conjugation prefix as a palatal or front velar fricative *x^{y} in Proto-Na-Dene. This sound regularly yielded /s/ in Yeniseic, as well. In Tlingit, according to Leer (2008:25), the onset of this prefix appears

to have sonorantized into the velar approximant *ɰu* (sometimes transcribed with initial *w or y*.

These two prefixes are distributed across the Yeniseic verbal lexicon in a way that suggests they originally may have had something to do with expressing contrasts in telicity (the presence or absence of a built-in end point in the verbal event). In Yeniseic it would appear that telic events are more often associated with *si-*, and atelic situations with *ɣa-*. Some Kott gerundive forms (traditionally called "infinitives" by Ketologists) denoting telic activities are built with word initial *ši-*: *ši-čal* 'sharpening', *ši-ti* 'beating', *ši-čaŋ* 'crumpling', *ši-git* 'turning, rowing', *ši-kit* 'rubbing, scratching'. The contrasting meaning of *ɣa-* is attested by the fact that all Modern Ket finite verbs denoting multiple actions or atelic activities contain this tense/mood prefix, though this may be a later development in Yeniseic. Kott and Yugh conjugations expressing atelic situations also contain reflexes of the *ɣa-* prefix. The Yeniseic perfective marker *n* used with *ɣa* expresses inception rather than completion: Ket *-ɣo-n-den* 'subject went, set out' (cf. *-ɣa-tn* 'subject goes, will go'). Complementary distribution patterns of the cognate prefixes **s(ə)-* and **ʁa-* in Na-Dene also tend to involve oppositions connected with telicity, though not necessarily in the same way as in Yeniseic.

The one striking difference between the basic TAM systems of Yeniseic and Na-Dene is the location of the progressive and perfective markers. Na-Dene adds them to the root at the end. Leer (1979) demonstrated how morphophonemic fusion between these suffixes and the verb root created the characteristic Athabaskan stem sets. Yeniseic places these elements on the auxiliary rather than on the final verb root, so that it evolved into a prefix within the verb string as a whole. Yeniseic therefore lacks Athabaskan-style stem-set allomorphs, since the suffixes that created them appear in Na-Dene on the auxiliary element instead. The progressive and perfective suffixes themselves, however, are cognate in both families. Yeniseic *l* appears in all activity or iterative verbs, while *n* appears in many verbs denoting single complete actions or transitions to a new state. In modern Yeniseic, this distribution has been lexicalized, with most individual verb stems requiring either *l* or *n* to express the past tense indicative and imperative. But there are a few doublets where the original contrast is particularly clear:

(1) *ha**n**tet* 'Subject broke it (once)' *ha**l**tet* 'Subject broke it/them (several actions)'
(*ha* – perpendicular, *tet* 'hit endwise')

The similarity between Yeniseic /n/ in the first example above and the Athabaskan mode prefix *nə-*, as well as with the *ñ(i)*-perfective/stative prefix is completely coincidental. The *nə-* mode prefix of Athabaskan is actually another conjugation prefix, and does not appear to have a cognate in Yeniseic. Yeniseic /n/ is cognate instead with the Athabaskan stem-set suffixal element *-ñ*, found at the end of perfective verb forms, which have cognates across Na-Dene.

Though prefixes, Yeniseic *l* and *n* functionally mirror the contrast between the Athabaskan progressive suffix *-ɬ* vs. perfective *-ñ* (palatal nasal). These suffixes are ancient, with cognates in Athabaskan, Eyak and Tlingit identified by Krauss and Leer in various publications. Leer (1979) demonstrated that the Athabaskan progressive and

future stem-set allomorphs originated from the root syllable's merger with an *-ɬ* suffix, the perfective stem allomorphs from merger with a nasal suffix. The Eyak forms of the perfective and progressive suffixes appear in Krauss (1965:171), where the perfective form *ɬ* represents an apparent diffusion of the progressive marker form rather than a true cognate to the perfective nasal suffix in the other languages. The Tlingit suffix forms are described in Leer (1991:154) and (2000). The Yeniseic cognates are added in Table 13.

Table 13. Cognates in Yeniseic and Na-Dene TAM suffixes

original suffix	Yeniseic	Athab.	Eyak	Tlingit
**ɬ* (progressive)	***l***	***ɬ***	***ɬ***	***n***
**n* (perfective)	***n***	***ñ***	(***ɬ***)	***ɯ***

In the modern Na-Dene languages these suffixes often show up only as morphophonemic modifications of the verb root rhyme, whereas in Yeniseic they are overtly present in most past-tense or imperatives forms, as shown in Table 14 below. Other Na-Dene aspectual suffixes identified by Leer (1979) – **k* customary, **t* semelfactive perfective, etc. – appear to lack Yeniseic cognates.

It is possible that the suffixes *l* and *n* in Yeniseic were once added to main verb roots, as in the modern Na-Dene languages. Some vestiges of this may be seen in the following doublets in the Modern Ket basic verb-root inventory:

(2) *Pairs of Ket verb bases distinguished by the* n *perfective prefix*

-ta 'to extend, be lying in position'	*-ten* 'to lie down, assume a lying position'
-si 'to exist, be'	*-sin* 'to come into existence'
-do 'to cut, chop'	*-don* 'to cut apart, rip completely apart'

Aside from these fossilized suffixes, if indeed that is what they are, the Modern Ket *-l* and *-n* affixes appear after the auxiliary rather than after the main verb root and thus show up as prefixes rather than suffixes.

The interplay between these two ancient sets of morphemes in Yeniseic – prefixes *s* vs. *ɣa*, and suffixes *l* vs. *n* – forms the core of the tense/mood/aspect system, building several productive tense/mood classes. Nearly every Ket verb belongs lexically to one of these classes based on how these two sets of morphemes – the old auxiliary plus its aspect suffix - interact to express the language's tense and mood distinctions. Yeniseic tense/mood classes play a lexico-grammatical role analogous to the interplay of Navajo *si*-perfective, *yi*-imperfective (< *ɣi*-), and *ni*-perfective verb forms.

Table 14 shows the four main tense/mood classes of Modern Ket, all of which have clear cognates in Kott, demonstrating inheritance from Proto-Yeniseic. It is important to note that the consonants /s/ and /ɣ/ in Modern Ket have disappeared for morphophonemic reasons except in cases where no other consonant occupies prefix positions 1 to 4; Vajda (2004) calls them 'morphotactic separators', but there is no doubt they were part of the original tense/mood marker, as they appear in Kott as well. Note that any position 4 vowel /a/ changes to /o/ in all past tense forms. This pattern is also observable regularly across Yeniseic, but appears to lack any parallel with Na-Dene.

Table 14. The four major tense/mood classes of Modern Ket

non-past indicative	past indicative	imperative
S/N-class (P2 *n* without P4 *a/o*; "s" appears only if no consonant occupies positions 3-1)		
kúɣissaal 'you.SG spend the night'	*kúɣinsaal* 'you.SG spent the night'	*kuɣinsaal* '(you.SG)Spend the night!'
ku^{6}-k^{5}-s^{4}-$saal^{0}$	ku^{6}-$ɣ^{5}$-n^{2}-$saal^{0}$	ku^{8}-$ɣ^{5}$-n^{2}-$saal^{0}$
$2SBJ^{6}$-TH^{5}-$PRES^{2}$-night.spend^{0}	$2SBJ^{6}$-TH^{5}-$PAST^{2}$-night.spend^{0}	$2SBJ^{6}$-TH^{5}-IMP^{2}-night.spend^{0}
S/L-class (P2 *l* without P4 *a/o*; "s" appears only if no consonant occupies positions 3-1)		
ksulsibet 'you.SG make a hook'	*ksulilbet* 'you.SG made a hook'	*sulilget* '(you.SG) Make a hook!'
ku^{8}-sul^{7}-s^{4}-bet^{0}	ku^{8}-sul^{7}-l^{2}-bet^{0}	sul^{7}-l^{2}-get^{0}
$2SBJ^{8}$-hook^{7}-$PRES^{4}$-make^{0}	$2SBJ^{8}$-hook^{7}-$PAST^{2}$-make^{0}	hook^{7}-IMP^{2}-make^{0}
A/N-class (P2 *n* and P4 *a/o*)		
kávi 'you.S sharpen it'	*kɔ́vini* 'you.S sharpened it'	*andí* '(you.S) Sharpen it!'
ku^{8}-a^{4}-b^{3}-i^{0}	ku^{8}-o^{4}-b^{3}-in^{2}-i^{0}	a^{4}-$n(d)^{2}$-i^{0}
$2SBJ^{8}$-$PRES^{4}$-3N.OBJ^{3}-sharpen^{0}	$2SBJ^{8}$-3N.OBJ^{3}-$PAST^{4/2}$-sharpen^{0}	$IMP^{4/2}$-sharpen^{0}
A/L-class (P2 *l* and P4 *a/o*)		
kúɣadaq 'you.SG live'	*kɔ́ldaq* 'you.SG lived'	*aldáq* '(you.SG) Live!'
ku^{8}-$ɣa^{4}$-daq^{0}	ku^{8}-o^{4}-l^{2}-daq^{0}	a^{4}-l^{2}-daq^{0}
$2SBJ^{8}$-$PRES^{4}$-live^{0}	$2SBJ^{8}$-$PAST^{4/2}$-live^{0}	$IMP^{4/2}$-live^{0}

The distribution of *-l* vs. *-n* in each pair of classes – S/L vs. S/N, and A/L vs. A/N – may have originally had something to do with conveying the event's spatial dimension, as well as its temporal aspect. Verbs expressing horizontal trajectories or goals (lay something flat, cut a slice or swath) tend to take progressive *-l* rather than perfective *-n* even when describing single complete events. It is unclear whether this distribution has any echo in Na-Dene.

Extremely interesting is the fundamental mutual exclusivity in the Yeniseic system between the tense/mood markers *s-* and *ɣa-* in light of certain exclusivities in the distribution of the cognate conjugation prefixes in Na-Dene. Kari (1979), who first worked out many of the aspectual categories in Athabaskan, demonstrates that *ɣa-* (atelic) and *s-* (telic) represent a fundamental division in active verbs. Young (2000:69) notes that in Navajo verb themes, *si*-perfectives never pair up with *yi*-imperfectives (< **ʁa*), except among semelfactives, which have *si*-perfectives and *yi*-imperfectives. Similarly, the Tlingit perfective prefix *uu-* (cf. chart in Naish & Story (1973:349), where it is transcribed as /woo/), which is cognate to Yeniseic and Athabaskan-Eyak *s ~s(ə)-*, is in complementary distribution with the prefix *ʁa-*, which is cognate to Yeniseic *ɣa-*[3]. The

[3] Naish & Story (1973:350) call *ʁa* the 'imperfective' prefix, but Leer (1991:108) points out that this prefix expresses a variety of semantically disparate functions (future, potential, hortative, and contingent modes). Tlingit *ʁa* is thus mainly characterizable on the basis of its mutual exclusivity with the Tlingit perfective suffix *uu*, with which it is in complementary distribution in the same position class.

widespread mutual exclusivity between the modern reflexes of the **ʛa-* and **x^{y}(ə)-* prefixes across both Yeniseic and Na-Dene, alongside the cognate status of the *-l* progressive suffix, and *-n* perfective suffix, provides striking evidence that the core tense/mood/aspect system of both families is homologous. It also lends support to Leer's original identification of the Tlingit perfective prefix *ɯu-* with the Athabaskan-Eyak conjugation prefix **s(ə)-*, an unusual sound change.

Finally, it is worth pointing out that Proto-Na-Dene had a perfective/stative prefix between the subject prefixes and the classifier consonant. This prefix was first described for Athabaskan by Kari (1976). Leer (2000) calls it the 'perfective/stative' prefix because it occurs in stative verbs that convey, specifically, a state created by a prior action; it does not occur in stative verbs of the type 'be long', 'be located', where no causal action is intimated. Yeniseic likewise has a stative suffix in exactly the same place in the verb complex (cf. Table 11 above) and with the same semantics: expression of a state created by a prior action named by the verb root. This suffix is productive in both Ket and Kott, showing that it belongs to the oldest layer of Yeniseic verb morphology: Kott *b-a-l-**a**-kit* 'it was (in a state of having been) rubbed'; Ket *-t-a-b-**a**-kit* 'it is (in a state of having been) rubbed'. It co-occurs with both the *s-* as well as the *ɣa-* tense/mood class prefix: Ket *il-u-k-**s**-**a**-bet* 'it is broken'. As in Na-Dene, the stative prefix in Yeniseic appears specifically in verb forms denoting states created by the effect of a prior action, and nowhere else, for which Vajda (2004) called it the 'stative resultative'. An analysis of prosodic patterns and epenthetic consonants in Ket and Yugh suggests that the proto-form of this suffix in Yeniseic was probably **yə*. Yeniseic stative resultative **yə* and Na-Dene perfective/stative **yi* are probably cognate, given their precise functional and positional congruity. This is truly striking, taken together with the cognate status of the other core components of the Dene-Yeniseic tense/mood/aspect system.

Each of the remaining prefix classes in the oldest layer of Yeniseic and Na-Dene verb morphology likewise appear to show at least a partial system of cognate elements, though my work in establishing these homologies is not as advanced as in the case of the Dene-Yeniseic tense/mood/aspect system described above. Let us look at each of these classes in turn. The purpose of the following three subsections is to suggest that the rest of the Yeniseic and Na-Dene verb complex core morphology may likewise turn out, with further research, to be largely cognate.

2.2.3. *Dene-Yeniseic spatial prefixes*

This section compares one subsystem from among the various prefixal elements found in Na-Dene and Yeniseic directly to the left of the tense/mood or conjugation prefix. These are the Ket 'determiners' or 'thematic consonants', many of which convey spatial dimensions. They are parallel the Athabaskan 'qualifiers' (cf. Kari (1989) on Ahtna), as well as incorporated body part nouns still occupying the same prefixal zone in Eyak and Tlingit. Vajda (2002:72-79) argued that some of the Yeniseic thematic consonants, notable Ket *t-* Yugh *č-* derive from incorporated body part nouns (PY **či'* 'head'), which clearly have cognates in Na-Dene (cf. PAE **tsaˑ* 'head').

An analysis of verb forms across Yeniseic demonstrates the presence of several consonantal prefixes directly before the tense/mood class prefix. This subsystem of the verb is very complicated in that these markers can concatenate and some have merged

phonologically together. Yeniseic-internal evidence suggests at least three ancient groups of morphemes, in a specific following order. Outermost (leftmost is the class of incorporated postpositions (preceded by a possessive pronominal marker that became a verb-internal object markers when incorporated into the verb string. Next come shape prefixes, at least some of which are homologous to Athbaskan shape prefixes and will will be examined in this section. Closest to the tense/mood prefixes are pronominal markers expressing the animacy of the third person subject (these will be examined in the next subsection). In Modern Ket the presence of these markers is lexically set. Most are unproductive, fossilized stem elements in the oldest layer of the verbal lexicon.

Some of these elements undoubtedly derive from incorporated inalienable body-part nouns like 'head', just as in Na-Dene. Others appear to have aspectual meanings, such as inceptive *d* in the productive stem type *-d-a-qan*, which describes the onset of a state expressed by an incorporated noun to the left of inceptive *d*: Ket *kən-d-a-qan* 'dawn begins'. While Athabaskan likewise contains an inceptive *d*-prefix in the same morpheme position, it is difficult to prove that individual Athabaskan 'qualifiers' are cognate with Yeniseic thematic consonants, since *d* is a common sound across the world's languages. Although it may turn out that more of these Yeniseic thematic consonants have Na-Dene cognates, or that certain vowel ablaut effects they produce have echoes in Na-Dene, this section will concentrate on three of them that form a distinctive mini-system in their conveyance of spatial distinctions. This sub-system appears to be homologous with a similar triple system of spatial prefixes in Athabaskan.

As is known, Proto-Athabaskan contained a series of prefixes that denote the shape of the core argument (the object of a transitive verb or the subject of an intransitive verb) or somehow analogically express the spatial dimensions of the action itself. These prefixes are: **n*- 'round', **d*- 'long', and **qʊ*- 'area, flat surface'. These prefixes are still productive in certain languages, such as Dakelh (Carrier) (cf. Poser 2005). Yeniseic possesses apparent cognates to all three of these prefixes. They occur in the same morpheme position – to the left of the tense/mood (conjugation) prefixes – and they express very similar meanings. Modern Ket has the following three prefixes, though the first two are completely unproductive: *n(a)*- 'round, around', *d(a)*- 'long shape, along', and *h(u)*- 'area, surface. Here are some examples of Ket, Kott and Yugh verbs containing shape prefixes:

(3) *Yeniseic stems containing spatial/shape prefixes*

Ket: *-**n**-a-b-hil* 'subject cuts it around the edges' (e.g., birchbark or rawhide)
-1SG.SBJ-**AROUND**-PRES-3N.OBJ-cut

Ket: *-**d**-a-b-do* 'subject chops it' (a long object, such as a log)
-**LONG**-PRES-3N.OBJ-chop cf: Ket *-a-b-do* 'subject cuts it' (no shape specified)

Kott: *-**d**^{j}-a-t^{h}ex* 'subject hits with long object, such as a whip'
-**LONG**-PRES-hit cf: Kott *-at^{h}ex* 'hit' (instrument shape unspecified)

Kott: *-**d**^{j}-a-giš* 'subject rows' (< turns long object)
-**LONG**-PRES-twist

Ket: -***n***-*a*-*b*-*do* 'subject chops it' (a round object)
-**ROUND**-PRES-3N.OBJ-chop

Ket: -***h***-*a*-*b*-*to* 'subject puts object onto a surface, erects object'
-**FLAT.AREA**-PRES-3N.OBJ-chop

Ket: -***h***-*a*-*b*-*daqŋ* 'subject glues object onto a surface'
-1SG.SBJ-**FLAT.AREA**-PRES-3N.OBJ-glue

Ket: -***h***-*a*-*tes* 'subject stands up'; Yugh -***f***-*a*-*tes* 'subject stands up'
-1SG.SBJ-**FLAT.AREA**-PRES-occupy.perpendicularly

Shape prefixes may stand in morphological word-initial position but in Modern Ket they are usually preceded by a subject marker (which Ket innovated at the leftmost edge of the verb).

The interaction of shaper prefixes with the following tense/mood position is interesting, as well. All three consonantal prefixes – *n, d, h* – are invariably followed in non-past verb forms by /a/, which resembles the vowel of the *ɣa* tense/mood prefix. Verbs containing spatial prefixes belong in Modern Ket to either the A/L or A/N tense/mood classes listed in Table 14 above. However, the vowel in question here is probably generalized from a vocalic element present in the original shape prefix and does not derive from the **ʁa* prefix. The difference between etymological **ʁa*-prefix verbs and those with /a/ deriving from a shape prefix to the left of the tense/mood slot remains visible in Yugh, the closest documented relative of Ket. In Yugh, the original gutteral onset of the tense/mood prefix yields falling, pharyngealized tone in the past tense forms: *u-oːʰ-n-de* 'she went, set out'. This does not happen in the case of a position-4 *a* or *o* vowel that derives from spatial prefixes. In the case of *n* and *d*, the vowel was probably **a* or **ə*. With *h* it was probably /u/, given the regular tendency of /u/, rather than the normally expected /o/, to appear after this prefix in past-tense forms: -*hu-l-tes* 'subject stood up', Yugh -***f***u-*l*-*tes* 'subject stood up'. This seems to concur with this morpheme's apparent cognate status with the Na-Dene prefix **qʊ-* 'area'. Compare the past tense forms of verbs containing *n* or *d*, where, like any normal vowel /a/ in this position it changes to /o/: -***d***-*o*-*b*-*l*-*do* 'subject chops it' (a long rigid object)', -***n***-*o*-*b*-*l*-*do* 'subject chops it' (a round object)[4]. It is likely that all of these verbs originally belonged to the S/L tense/mood class. In Modern Ket, the *s* would have deleted after a consonantal prefix in this position, so that the vowel of the shape prefix was reinterpreted as a tense/mood marker. The Dene-Yeniseic cognates for this unique triple set of shape prefixes appear in Table 15:

[4] Note that in Modern Ket the inanimate prefix *b* has moved forward in between the two tense/mood marking positions. This is an innovation, not observed in Yugh or Kott (cf. section 2.2.4).

Table 15. Cognate Yeniseic and Na-Dene spatial prefixes and incorporated nouns

expression	Ket	Athabaskan	Eyak	Tlingit
(round, around)	*n(a)* (*deˑs* 'eye')	**nə* (<*neˑG̃əʾ* 'eye')	*ɬəχə* (<*ɬaˑχ* 'eye')	*waʿɢ* 'eye'
(long, along)	*d(a)*	**də*	*də*	?
(area, flat)	*h(u)*	**qʊ*	-	*qʊ*

The area prefix **qʊ* is found in Athabaskan and Tlingit, with an apparent cognate in Yeniseic, but the origin of this morpheme is unclear as no independent noun source seems to exist. It is not clear from the published materials whether Eyak has a direct cognate to the Athabaskan shape prefix *d*, so that the origin of this formant is obscure. It is possible that it is originated as a 3rd person possessive element or from the *də* formant found as the second syllable in words for body parts such as 'leg' (PA **gʷa-də*). The round shape prefix in Athabaskan-Eyak likely derives from the word for 'eye', which still appears in Tlingit as an incorporated noun. The Yeniseic round prefix likely also derived from the cognate for 'eye'. This word has become *deˑs* in Modern Ket, however, due to the change of all word-initial nasals to non-nasals (except in the case of word-initial proclitics) and the fronting of coda *χ* to *s* after a front vowel (cf. section 3 below). Further analysis of Yeniseic thematic consonants is likely to show additional homologies with the Na-Dene incorporated body part nouns, incorporated postpositional elements, and spatial morphemes.

There is much more to say about this area of the verb, particularly regarding incorporated body part nouns and the preceding object agreement prefixes, which seem to have originated, at least in Yeniseic, as incorporated pronominal possessive pronouns connected with body part nouns or postpositions. I must learn a great deal more about Eyak verb structure from Michael Krauss's yet unpublished work, which he has very generously made available to me, before taking the comparison further. I will also not deal with homologies in object prefixes or incorporated postpositions in this paper.

2.2.3. *Dene-Yeniseic homologies in pronominal elements*

All accepted language families show homologies in their pronominal systems. Given the intricate subsystems of cognates morphemes among Yeniseic and Na-Dene tense/mood aspect and spatial prefixes, it would seem inconceivable that no trace of cognancy would be detectable in the pronominal elements that richly endow the same finite verb structure. Unfortunately, reconstructed proto-forms have yet to be published for either Proto-Yeniseic or Proto-Na-Dene. Part of the problem is that the first and second person pronouns appear to have contained sounds that were highly unstable historically (unlike the famous 1st person singular *m* of Indo-European). The 1st person singular subject agreement prefix forms for Athabaskan, Eyak and Tlingit show a unique correspondence, for which Leer (2008:5), following Krauss (1969), uses a dollar sign ($) rather than an actual phonetic symbol. The original Proto-Na-Dene sound was most likely

something like *x^w or *x. The Proto-Athabaskan form of the 1st person plural pronoun is even less clear [5].

Although the comparisons made below are preliminary, they suggest that much of the core pronominal system of Yeniseic and Na-Dene could turn out to be cognate. Table 16 juxtaposes pronominal forms in four Yeniseic languages (Werner 2005) with Proto-Athabaskan (Krauss & Leer 1981), Eyak (Krauss 1965, 1969), and Tlingit (Leer 1991:58). Note that the Yeniseic plural pronouns end in a nasal suffix used widely for noun plurals, as well. It is unclear whether the Tlingit final nasal in the 1st and 2nd person pronouns has any connection with the nasal plural ending in Yeniseic. The final /d/ in the free-standing 1st singular pronoun in Tlingit and some Yeniseic languages is a chance resemblance, with Ket/Yugh/Pumpokol *d* (as well as Kott/Arin *j*) in these forms deriving from *x, possibly homologous with Na-Dene 1st person $š \sim s \sim x^w \sim x \sim \chi$ (see below). Jim Kari (p.c.) suggested the two Proto-Athabaskan 1st person plural reconstructions listed below. The Eyak 1st person plural subject prefix I could not locate in the published materials. The varying 3rd person pronoun forms given for Kott and Arin reflect separate dialects recorded by different 18th century travelers. The subject prefixes in Table 16 are those found closest to the verb base. Question marks in the Arin and Pumpokol columns indicate that the required pronoun forms were simply never recorded.

Table 16. Personal pronouns in Yeniseic and Na-Dene

	Ket	Kott	Arin	Pumpokol	PA	Eyak	Tlingit
1st singular							
free pronoun	*ad*	*aj*	*aj, ja*	*ad*	**ši*	*xuˑ*	*χád*
subject prefix	*d(i)*	*i*	?	*x*	**š~s*	*x~s*	*χa*
1st plural							
free pronoun	*ətn*	*ajoŋ*	*aiŋ*	*adiŋ*	*~*dəne*	*daˑ*	*ʔuháˑn*
subject prefix	*dəŋ*	*an*	?	?	**č^{w}ʼə ~ *iʼd*	Ø	*tuˑ*
2nd singular							
free pronoun	*uˑ*	*au*	*au*	*ue*	**ñəñ*	*ʔiˑ*	*waʔé*
subject prefix	*k(u)*	*i*	?	?	**ñə*	*yi*	*iˑ*
2nd plural							
free pronoun	*əkŋ*	*aoŋ*	*aŋ*	*aiáŋ*	**nəx^{w}ən*	*łəχi*	*ɯi‘h(ʷ)áˑn*
subject prefix	*kəŋ*	*on*	?	?	**əx^w*	*łəχ*	*ɯi*
3rd singular							
free pronoun	*buˑ*	*uju, ha-tu*	*au ha-tu*	?	**yən*	*ʔaˑ*	*hú*
subject prefix	Ø	Ø	?	?	Ø	Ø	Ø

In the analysis that follows, I will argue that the personal pronoun forms of Yeniseic and Na-Dene could be homologous if the 1st person singular derived from a

[5] Regarding the 1st person plural, Krauss (1969:82) writes, "It is in fact impossible to reconstruct any first personal plural pronoun common for PAE or even PA for all of Athabaskan." The Eyak verb does not mark the first person plural subject with a prefix form at all.

morpheme involving the velar fricative *x*, the 2nd person plural (and possibly the 2nd person singular, as well) derived from a morpheme containing the velar approximant *ɯɻ*, and the 3rd person free-standing pronoun was **wə* or **hʷə*, which would be cognate to the Tlingit *hú·* 'he' and possibly with pronominal *b-* prefixes in Athabaskan, as well. The d/t-element in Yeniseic 1st plural forms (*ətn* 'we', ***d**əŋ* '1pl subject') is likely a fossilized distributive plural marker, just like the *d*-element in certain 1st plural Athabaskan forms. Some irregular Ket verbs still show a distributive *d*-prefix on the verb root in much the same way as some Na-Dene languages add a distributive prefix to the left of the conjugation markers.

Both Proto-Yeniseic and Na-Dene originally placed speech-act-participant agreement prefixes to the right of the tense/mood marker, while agreement with a 3rd person subject, when marked, appeared to the left of the tense/mood prefix. In Yeniseic, 3rd person subject prefixes behave more like animacy classifiers than actual person agreement markers. The original system was best preserved in Kott, where some verbs take animacy-classifying *dʲ* even in the 1st and 2nd persons (Vajda 2007), but evidence of it can be found in the oldest layer of Ket verbs, as well. Table 17 shows part of the Kott paradigm based on Proto-Yeniseic **ten* 'lie down'. The agreement morphemes in position 1, directly before the root, are the oldest surviving speech-act-participant subject forms found in Yeniseic; the same forms occur in a few archaic Ket verbs, as well. Because the forms of the 1st and 2nd person subject agreement prefixes became homonymous, Kott innovated subject suffixes (position -1), while Ket innovated a new subject prefix position at the leftmost edge of the verb form. But the original 1st and 2nd person subject prefixes remain in verbs of basic vocabulary, resulting in multi-site subject marking, a hallmark of the Yeniseic agreement system.

Table 17. Fragment of a Kott paradigm showing the earliest Yeniseic subject prefixes

	tense/mood.class[3]-PAST[2]-SBJ[1]-**lie,down**[0]-SBJ[-1]	
I lay down	*alite:naŋ*	< *a*[3]-*l*[2]-*i*[1]-***te:n***[0]-*aŋ*[-1]
you lay down	*alite:nu*	< *a*[3]-*l*[2]-*i*[1]-***te:n***[0]-*u*[-1]
he/she lay down	*alte:n*	< *a*[3]-*l*[2]-***te:n***[0]

It is likely that the original shape of the two Proto-Yeniseic subject prefixes was **xʷi* (1st person singular) and *ɯɻi* (2nd person singular). There is evidence that *x* elided everywhere in Kott and Ket before original high vowels, remaining only in Arin and Pumpokol. Although few verb forms in these languages were recorded, a few Pumpokol forms show the first-person prefix as the fricative *x* or *h* (it is not clear how well these transcriptions distinguish velar, uvular, and glottal fricatives). This pattern also appears in nouns with Na-Dene cognates, such as Yeniseic words for 'sun' or 'sunshine' – Pumpokol *hɨ-χem*, Arin *xa-gali* vs. Kott *e-ga* and Ket/Yugh *iˑ-gan* – which are cognate with Proto-Athabaskan **xʷaˑ* 'sun' and possibly include **gʷən* 'light', as well. The free-standing 1st person singular pronoun was recorded in Arin and Assan as *aj*, and in various 18th century Kott dialects as *aj* or *ja* (Werner 2005:248) in contrast to Ket/Yugh *ad* 'I'. The vowel /a/ is a peg element that occurs in other pronominal forms (e.g., Kott *au* 'you.singular'). The palatal continuant /j/ in 20th Ket and Yugh is realized phonetically as the fricative /ç/ rather than as a sonorant. Kott coda /j/ regularly corresponds to Ket /d/;

also, where such words have putative Na-Dene cognates the Proto-Na-Dene sound is *x. So, despite the array of new subject affix forms in Yeniseic, and the irregular sound correspondence between the various Na-Dene versions of the 1st person singular morpheme, it is probable that the 1st person marker in Proto-Yeniseic was *x or *x^w as it possibly was in Na-Dene.

The 2nd person marker was most likely a velar approximate *$ɯ$. This sound elided word initially, and became *k* before a consonant; it also regularly labialized an adjacent epenthetic *i* to *u*. This can be seen in Kott/Arin *au* 'you' (< *a-$ɯi$) and the Ket prefix *ku* (< *$ɯi$). The Modern Ket *k* that originated from Common Yeniseic velar plosive *k never labializes adjacent vowels. This element could be homologous with the $ɬ$ or $ɯ$ found in Eyak and Tlingit 2nd person forms. This would mean that consonantal elements associated with both the 1st and 2nd person subject agreement prefixes in Yeniseic and Na-Dene might turn out to be cognate. Without a good reconstruction of both the Proto-Yeniseic pronoun system as well as that of Proto-Na-Dene, however, these observations remain conjecture.

Third person markers in both Yeniseic and Na-Dene appear in a different position verb internally than the 1st and 2nd person markers: to the left of the tense-mood (i.e., conjugation) prefixes. In the oldest layer of Kott verbs, 3rd person agreement was expressed by a prefix d^j for animate-class subjects, and *b* for inanimate-class subjects. See Vajda (2002; 2007) for a detailed discussion.

(4) Kott: ***d^j***-*a*-*fel,* 'he/she grows' ***b***-*a*-*fel,* 'it grows'
3**anim**-pres-grow 3**inan**-pres-grow

Traces of this system are visible in Ket, where *d* appears vestigially in a number of verbs to mark the animate object (rather than the subject), while the inanimate-class prefix *b* has been regularized as both a subject and an object marker. See Vajda (2002 and 2007) for a detailed discussion. It is noteworthy that verb prefixes represent the only instance where Kott d^j corresponds to Ket *d*, and Kott *b* to Ket *b*. Nominals such as Kott *d^{j}al*, Ket *dɯˑl* 'child' are historically gerundive forms represending the collapse of the verbal disyllable ***d^j***-*a*-*fel* 'animate subject grows'. This explains the use of Ket *dɯˑl* as the modifier of *kəʼt* 'one's own children' in the compound *dɯlgat* 'children'. Elewhere, Ket *d* and *b* invariably correlate with Kott *t* and *p*. The special correspondence in verb prefixes is due to a special rule of proclitic voicing that operates in Modern Ket. The 3rd person prefixes, as well as the spatial prefixes that appear in the same area of the verb (long-shape *d*), were likely proclitics in Proto-Yeniseic. This suggests the original consonant onset of the animate-class prefix, as well as the long-shape prefix, was *d (voiceless unaspirated). Possible evidence for this comes too from Eyak, where incorporated body-part nouns in this position sometimes are followed by the form *də*: *qiˑ* + *də* 'foot' + *d*-element' (Krauss 1965:173). It is possible that certain functions of the Athabaskan d-qualifier derive from the use of a pronominal clitic to incorporate body part terms such as arm, leg, foot, etc. The 3rd person *d*-prefix also shows up in Modern Ket possessive prefixes (ex. *da-ki^{ʔ}s* 'his foot', *da-ko^{ʔ}t* 'his buttocks') and may be cognate with Tlingit 3rd person possessive *dʊ*, as in *dʊ χʼuːs* 'his foot', *dʊ ɢáts* 'his buttocks'). It is likely that this *d*-element was originally a possessive proclitic rather than an agreement marker.

As far as concerns actual free-standing pronominal forms for the 3rd person in Yeniseic, these appear to involved a proto consonant *w (or *h^w) which yielded b in clitic position, but h as the anlaut of a phonological word; these element appear cognate with Na-Dene 3rd person pronouns involving the same sounds. It is more speculative to claim that the Yeniseic b-prefix, which is a verb internal inanimate (never animate!) marker, is cognate with Navajo b, which a 3rd person *animate* marker. Ket/Yugh *bu* 'he, she' is likely a contraction of *$buha$, where *ha* is the original pronoun and *bu-* is a voiced proclitic. The half-long vowel in Modern Ket bu' would be the expected result of such a contraction. This etymology is directly supported by the earliest recordings of Ket, made in the 18th century, which contain forms like $buhoŋen$ for 'they' (cf. modern $bu'ŋ$ 'they'). Aside from proclitics, Yeniseic b does not correspond phonologically to Athabaskan-Eyak b. Cognates in basic vocabulary show that it is Ket h that corresponds to Athabaskan-Eyak *w and Tlingit h (cf. cognates for 'stomach' in section 3). The first syllable of Kott and Arin *hatu*, where the root *ha* appears to be followed by the possessive affix *-tu* (cf. the similar morphology of Ket *bu-da* 'his'), may likewise be cognate to Tlingit $hú'$ 'he'.

Given that neither the Yeniseic nor Na-Dene system of pronouns has yet been reconstructed to the proto-level, it is premature to conclude anything about the cognate status of pronouns in these two families. As stated above, the original Proto-Yeniseic consonants associated with the three persons were most likely a velar fricative x (1st person singular), the velar approximate $ɯ$ (2nd person plural, and, at least in Yeniseic, singular as well) and the labiovelar *w or *h^w (3rd person). The 2nd person plural forms in Table 17 appear particularly promising as potential cognates.

At this point, the only certainty is that the positional contrast between 1st and 2nd person subject markers (after the tense/mood prefix) and 3rd person markers (before the tense/mood prefix) exhibit an exact parallel in Na-Dene and Yeniseic. This arrangement is shown in Table 18.

Table 18. Comparison of person agreement marker positions in Na-Dene and Yeniseic

	auxiliary complex		***root complex***
Na-Dene:	**3p agreement**-AUX-**1/2p agreement**		classifier-root-TAMsuffix
Yeniseic:	**3p agreement**-AUX-TAMsuffix	**1/2p agreement**	verb base

As far as concerns historical linguistics, Dene-Yeniseic differs from other families in the relative inscrutability of its pronominal cognates. Cognancy in basic pronouns is normally of the first obvious pieces of evidence in establishing an accepted genetic link. In the case of Dene-Yeniseic, extensive evidence of the genetic connection has first been found in other subsystems of the verb complex, as well as in basic vocabulary prior to making the case for pronoun cognancy. Given the (over)emphasis traditionally placed by historical linguists on pronominal markers, the inherently unstable phonological forms of Yeniseic and Na-Dene pronouns seem to be a major reason this particular genetic connection was not seriously investigated much earlier. Because Modern Ket pronouns bear little superficial resemblance to those in Na-Dene, practically no one bothered to look further.

2.2.4. *Origin of the Na-Dene "classifiers"*

The famous Na-Dene pre-root "classifiers" have no analog in other Native American families. Krauss (1969) demonstrated these forms derive from the intricate interactions of three originally separate components: a *y*-component (e.g., *i*-component) derived from the perfective/stative affix, a *d*-component of unknown origin that in the modern languages productively signals valence decrease of various types, and an *ɬ*-component of unknown origin that in the modern languages productively expresses valence increase. The reason for vestigial non-valence-related uses of the *d*- and *ɬ*-components remains a mystery. Non-valence related uses of classifiers include the *d*-classifier in transitive verbs meaning 'drink' or the *ɬ*-classifier in Navajo intransitive *yaɬti'* 'he's talking' (Young 2000:29).

One piece of evidence has surfaced that could shed light on this question. Leer (2008) showed, on the basis of Tlingit data, that the series component of modern Athabaskan and Eyak represents two formerly distinct elements: *s*- and *ɬ*-. These elements remain phonologically distinguishable in Tlingit, despite much reshuffling of the original system, but fell completely together in Athabaskan-Eyak. Leer also suggested that some of the non-valence uses of the Athabaskan-Eyak *ɬ*-component may reflect functions of the original *s*-component. Perhaps most important, Leer (2008) definitively showed that the original order of the three classifier components was: *y*-component (an echo of the perfective/stative prefix), followed by the series component (*s* vs. *ɬ* in Tlingit, *ɬ* in Athabaskan/Eyak), and finally *də*, which stood directly before the following root. This ordering will prove crucial in the Yeniseic comparisons made below.

The Yeniseic verb does not contain Na-Dene-style "classifiers" between the subject prefixes and the verb root; there are not, and apparently never were, pre-root *d*- or *ɬ*-prefixes used productively to signal grammatical valence increase or decrease in Yeniseic. However, all three components of the Na-Dene classifiers (with the exception of the Tlingit series marker /s/) appear to have cognates in Yeniseic, though the evidence for a Yeniseic verb-internal cognate to the proto-Na-Dene series marker **ɬ* remains marginal, at best (cf. footnote 6 below). The nature and functions of the Yeniseic cognates to Na-Dene classifier components offer important external evidence as to the origin of the Na-Dene classifier system itself, prior to the rise of the productive system of grammatical valence increase and decrease marking – a system that presumably already existed in Proto-Na-Dene. The next several paragraphs will summarize and extend what has been suggested as to the origin of the various Na-Dene classifier components, bringing in Yeniseic comparanda where useful.

Krauss and Leer in various publications (cf. especially Leer 2000) demonstrated that the y-component of the Na-Dene classifier arose as an assimilatory effect on the classifier vocalism created by the preceding perfective/stative morpheme. I argued in section 2 above that this element may be represented in Yeniseic by the stative/resultative prefix **yə* (Modern Ket /a/) at least structurally if not in actual cognate form. Below I will argue that the *d*-component originated as a 3rd person possessive prefix and originally functioned to create verbs out of body-part nouns; only later, and only in Na-Dene, did it develop into a productive valence-decrease prefix. I

will also argue that the *ɬ*-component, at least in its valence-increase function, originated from, or more likely was reanalyzed as, an instrumental suffix on the preceding subject markers. In other words, the *ɬ*-series classifier element, which is homonymous with the *-ɬ* instrumental suffix, was reanalyzed as the latter, thus giving rise to its productive use as a valence-increase marker; this only occurred in Na-Dene. Along the way, I will show that the *-ɬ* instrumental suffix is used to build tool nouns in both Yeniseic and Na-Dene; this element may also appear in a postposition expressing 'with' in Na-Dene, and as the postposition 'from' (ablative) in Modern Ket. Finally, I will employ Yeniseic comparanda to explore further the issue of homonymy between the progressive *-ɬ* suffix, the *ɬ*-classifier component, and the *-ɬ* instrumental suffix found in nominal morphology. Jeff Leer has observed that the Na-Dene progressive verbal suffix and the nominal instrumental suffix appear to have exactly the same reflexes across Na-Dene (Leer, personal communication). To this observation one could cite the homonymy between these two elements and the *ɬ*-component of the classifier. My goal is to illustrate the connection between the parallel uses of what may have been – at least in the case of the instrumental suffix and the progressive suffix, if not the *ɬ*-classifier itself – one and the same morpheme.

Vajda (2006) argued that the productive valence increase and decrease functions of the *d-* and *ɬ*-components of the Na-Dene classifiers are secondary developments, arising from their original verb-deriving functions already in Proto-Na-Dene. The *d-* element appears to have originally been used to create verbs from body parts, in which case it may have originated from the 3rd person possessive marker discussed above. Proto-Yeniseic contained generic third-person pronominal **də* (cf. Ket *da-kiˀs* 'his-foot'). This prefix possibly has an echo in the Modern Ahtna Athabaskan prefix *də*, used to signal reflexive possession: *de-qe'* 'his/her own foot' (Kari, p.c.) and in Tlingit 3rd person possessive prefixes (cf. 2.2.3 above). In Yeniseic, this morpheme appears to have been prefixed to inalienably possessed nouns to create verb bases denoting actions performed using the subject's own body parts: mouth, legs, arms, etc. These include verbs of sound or bodily activity, as well as verb involving light or the action of fire. In some instances, there are doublets such as Ket *it – diˀt* 'smell, sense' that directly suggest the initial *d-* was a prefix. In other instances, a *d* onset appears in verb bases denoting actions performed by using the subject's own body as the instrument, such as *-doq* 'fly', although without a clear corresponding base lacking *d-* to prove its prefix origin. I would call these usages of pronominal *də-* to build verb bases "auto-instrumental" or "reflexive-instrumental" in meaning. This semantic connection could explain how a prefix of this nature later came to be used to signal grammatical valence-decrease in Na-Dene – since it signaled agent and instrument were naturally one. In its original function, this prefix became a fossilized thematic element in Proto-Na-Dene. In Athabaskan, its functions were sometimes replaced by one of the *d*-qualifiers prefixed to the conjugation marker. In modern Athabaskan some uses of the *d*-qualifiers denote action using a body part (hands, legs, arms); they are also used in self-benefactives and reflexives. These prefixes also appear in verbs involving sound, body part usage, or fire. In Yeniseic, the *d*-prefix coalesced with the following root to form the modern verb base (equivalent of the lexical root in the verb complex). In other words, in

Athabaskan the original 'auto-instrumental' function of this pronominal element came to be expressed as a prefix on the conjugation marker (i.e., the old auxiliary verb), with pre-root *də* evolving into a productive valence reduction marker, with a few instances of thematic uses left over as lexical fossils. In the Na-Dene classifier complex itself, the original "auto-instrumental" function of *də-* is obvious only in rare items such as transitive verbs for 'drink', found in all Na-Dene languages (cf. Navajo *na*^{9}*sh*$^{3/2}$*d*^{ł} *dlííh*^{0} 'I repeatedly drink it' (numbers refer to prefix positions given in Table 2 above), where the *d*-classifier is clearly not related to transitivity.

Pronominal *də* originally appeared as a thematic prefix on inalienably possessed nouns as well as "auto-instrumental" verbs in both families. When followed by a continuant element, with which it merges, it yields characteristic reflexes in the Yeniseic daughter languages (Ket *d*, Yugh *d*^{j}, Kott *č*) that distinguish it from simple **d* (originally unaspirated /t/) which has the reflexes Ket/Yugh *d*, Kott *d*^{j} in proclitic position (see section 2.3 above) and elsewhere as Ket *d*, Yugh *d*, Kott *t* (see section 3 below).

Table 19. Yeniseic-Athabaskan cognates for 'laugh'

Ket	Yugh	Kott	*Proto-Athabaskan
d	***d*^{j}**	***č***	****dl***
dàʁ	*d*^{j}*a:*^{h}*χ*	*čak*	****dluk***$^{'}$

In Yeniseic verb bases, the prefixal nature of this *d* is revealed by the tone. Falling tone indicates fricative segment loss from a former cluster: Ket *dìs* 'to scold', *dàm* 'to bark' In the Yugh cognates, the falling tone is regularly accompanied by pharyngealization in the second phase of the vowel, which more clearly reveals how falling tone originated from fricative loss: cf. Yugh *d*^{j}*ì:*^{h}*s* 'to scold', *d*^{j}*à:*^{h}*m* 'to bark'). The Yugh/Ket/Kott correspondence *d*^{j} - *d* - *č* suggests an original affricate in early Yeniseic (derived from the combination of d + a fricative onset in the original verb root. Cf. a possible cognate in Nav. *dziih* 'scold', another verb of sound. In such verbs, anlaut *d* may be a fossilized instance of the same "auto-instrumental" prefix found in Yeniseic. This would concur with Leer's (2008:2-3) observation that the rare clusters *dl* and *dz,* appear to be composite and do not represent phonemes found in Proto-Na-Dene.

Vajda (2006) also suggested that at least some instances of the Na-Dene *ɬ*-classifier derived from an ancient prefix used to derive verbs from adjectives or stative verbs. Some evidence that the same verb-derivation technique once existed in Yeniseic can be found in verb-base doublets where the prefixed form denotes an activity or process, while the non-prefixed form denotes a more passive or less active state.

Table 20. ***Possible Dene-Yeniseic cognates involving the ɬ-component of the classifier***

	stative	*active*
Ket:	Ø-*oŋ* 'see'	***q***-*oŋ*, ***q***-*o* 'look at, search for'
Yugh:	Ø-*oŋ* 'see'	***χ***-*oŋ* 'look'
Arin:	? (not recorded)	***l*^{j}**-*oŋ* 'look'
cf. Proto-Ath.:	Ø-^{ʔ}*en* 'see, glimpse'	***ɬ***-^{ʔ}*en* 'look at' (YM92:249-50)

Another possible cognate structure can be found in Athabaskan *-*liñ*, 'flow', which derives from PPA **ɬ-həñ*. It appears to be cognate with Ket *qiˑn* 'to flow', Yugh *χiˑn* 'to flow'. Table 21 shows the Yeniseic reflexes of the *d*-element observable in auto-instrumental verbs such as 'scold, bark' along reflexes of the *ɬ*-element in active/stative pairs such as 'look vs. see':

Table 21. ***Yeniseic verb-base prefixes and Na-Dene classifier elements***

	Yeniseic verb-deriving prefixes				*Na-Dene classifier elements*		
original base	***Ket***	***Yugh***	***Kott***	***Arin***	***PY***		
(inalienably possessed noun)	*d*	d^j	*č*	*?*	****da***	****də***	(later: transitivity decrease)
(stative verb)	*q*	*χ*	*g*	l^j	****ɯq (<*ɬ)***	****ɬ***	(later: transitivity increase)

Uvular reflexes of **ɬ* in some Yeniseic languages suggest the prefix was affected by the place of articulation feature of the following root onset. Unfortunately, Yeniseic has too few examples of this correlation to be clear on the details of this process[6].

In Yeniseic, both of these pre-root prefixes merged with the root to create the verb base, becoming vestigial fossils rather than developing productive valence-change functions, as they did in Na-Dene. It is not at present clear which Modern Ket verbs with a *d*- or *q*-onsets represent a fossilized prefix, though it is noteworthy that more than a third of Ket verb bases begin with one of these two sounds (cf. the list of bases provided by Georg 2007:217), suggesting the presence of a prefix in at least a number of them.

The finding of vestigial pre-root **ɬ* in Yeniseic still does nothing to help identify the morphological source of the actual *ɬ*-component morpheme itself or fully explain the rise of its valence-increase function in Na-Dene. Leer (2008) suggested the *ɬ*- and *s*-series consonants may derive from two (or possibly more) ancient nouns preposed to the verb root to classify the action somehow in spatial terms. It is also possible that the valence functions of *ɬ* later developed on the basis of this element's homonymy with the *ɬ* instrumental suffix or postposition found in the Na-Dene nominal system. Through homonymy, the *ɬ*-series consonant might have been reanalyzed as equivalent to an instrumental suffix associated with the preceding subject position. In such a scenario, the productive valence-increase function of the *ɬ*-classifier could involve analogy with the instrumental meaning this suffix imparts to nominal forms. Note that the same suffix may also show up as an instrumental postposition on Athabaskan pronouns (< PA **tɬ'* with'), as first suggested by Li (1956): cf. Modern Navajo *biɬ* 'with him'. The form of the Ket/Yugh ablative formant is also phonologically compatible with an origin from **tɬ'*. The voiced /l/ in Ket *-al* 'from', as well as the tone and

[6] Although I have left this comparison in the present paper, I expect soon to be able to explain all instances of Yeniseic-internal correspondences involving verb root-initial /*q* : *χ* : l^j/ as arising from other sources. I now think it is highly unlikely that Yeniseic contains any direct homology to either the *s*- or the *ɬ*- series component of the Na-Dene classifier. The d-component, however, appears homologous with the *də* possessive prefix (perhaps originally denoting inalienable possession) found in both language families. There is sufficient evidence to show that the same prefix attaches to both verbs and nouns in Yeniseic as well as Na-Dene. The vestigial remnants of Yeniseic pre-base *d*- parallel only certain thematic uses of the Na-Dene *d*-component. The modern classifiers themselves, with their multi-morphemeic origins and productive valence-changing semantics, remain the unique hallmark of Na-Dene.

length of the preceding vowel in Yugh: Yugh *-aːʰr* 'from' are consistent with an origin from final **tɬ'* (cf. section 3.2 on coda reductions below).

Yeniseic shows no evidence of an instrumental suffix being added after the speech-act-participant subject morphemes in the verb complex or of the rise of valence-increase function from an element between the subject prefix and the verb base. However, the homonymous morpheme in question – the *ɬ*-instrumental suffix – definitely exists in the Yeniseic nominal system, where it is cognate in form and function to the Na-Dene instrumental suffix; cf. Li (1956) for the classic description of this suffix in Eyak and Athabaskan. Just like Na-Dene tool nouns, Yeniseic tool nouns are sometimes built using an instrumental suffix *ɬ*, demonstrating how ancient this element is. Yeniseic examples include **hut* 'pound' -> **hutl* 'mallet, club' (> Modern Ket *húùl*, where coda **tɬ* regularly yields rising/falling tone and coda *l*), as well as **sukl* 'holding hook' (Modern Yugh *sùːʰɬ*) from **suk* 'motion back, hook-shaped' + the *ɬ* instrumental suffix. Compared with Na-Dene, Yeniseic 'holding hook' provides a convincing example of a cognate root combined with a cognate instrumental suffix: cf. PA **šʷəχ-ɬ* 'hook' (Krauss & Leer 1981:194), which likewise derives from a base meaning 'hook shaped' plus the instrumental suffix *ɬ*. Another promising candidate is Ket *tatɬ* 'fire sticks (used to make fire by friction)', from *tat ~ tet* 'across' + *ɬ*. Cf. also a possible parallel between Ket 'pound' vs. 'mallet' and Koyukon Athabaskan *hʊɬ* 'club', *hʊtɬ* 'strike with elongated object' (Kari 2000:243), though the *ɬ* coda in Athabaskan 'club' is not reconstructed as containing the instrumental suffix; nor is it associated with the verb *-hʊtɬ*, to my knowledge. Other potential Na-Dene/Yeniseic cognates in tool vocabulary show the clear presence of the instrumental suffix in Na-Dene but its absence in the Yeniseic forms (presumably through coda cluster simplification, which would have deleted final *ɬ* after a nasal): cf. Ket *həʼŋ* 'throw net' vs. PA. **wənʼ-ɬ* 'net, lage game snare' (Krauss 2005:129); a possible Yeniseic-internal piece of evidence for the presence of this suffix comes from Ket *həŋlis* 'spider web', though the form and meaning of the second syllable (*-lis* or *-is* is unclear). Some of the Yeniseic nouns built with the instrumental suffix offer potential evidence that the roots taking the instrumental suffix were originally stative or shape-classificatory in nature (hook-shaped, crosswise motion), which might help explain this element's parallel functions in nominal forms (instrument) as well as verbs (progressive aspect).

If Na-Dene did innovate a verb-internal usage of the instrumental morpheme while the verb string was a more analytic structure than it is today – even if this innovation represents nothing more than reanalysis of a morphologically unrelated *ɬ-* prefix that happened to be homonymous with the instrumental suffix – it might account for why *ɬ-* came to precede *də-* in the Na-Dene classifier complex. The *də* remained a pronominal prefix directly attached to the following root, while *ɬ-* came to be associated with the preceding subject pronoun position. This would account for why *ɬ* preceded *d* when both appear in the same verb complex, a combination that later generated the voiced *l*-classifier of modern Athabaskan. The amalgamation of both suffixal and prefixal elements into the modern classifier might also help explain its unique morphophonological edge properties. Non-transitivizing uses of series components *ɬ* and *s* in Proto-Na-Dene may have ultimately derived from two or more spatial or shape classifying elements. In the proto-Yeniseic verb complex, by comparison, only non-valence-marking *d* (and possibly **ɯ*, homologous with original Na-Dene classificatory *ɬ*) seem to have a place.

Revisiting once again our comparison of the bipartite auxiliary verb + lexical verb root structure of the proto-Yeniseic and Proto-Na-Dene verb, we can now posit an earlier tripartite analytical string with the following homologies (and non-homologies) involving the components that later merged to create the modern Na-Dene classifier. Note there is no evidence for an instrumental *ɬ* suffix in Yeniseic after verb-internal subject pronouns, though this suffix did exist in Proto-Yeniseic outside of the verb complex, where it was used, as in Na-Dene, to create instrument nouns. Note also that it is not clear whether element marked with an underline as "instrumental *ɬ*" in Na-Dene represents an actual morpheme distinct from classificatory *ɬ* or rather a reanalysis of the latter on the basis of the homonymous instrumental suffix/postpositional element found in the nominal system. The reanalysis hypothesis seems more probable; in any event there is no trace of the instrumental suffix being used inside Yeniseic verbs after the subject pronouns in question.

Table 22. ***Original position of elements that became the Na-Dene classifiers***

	auxiliary complex	***subject complex***	***root complex***
Na-Dene:	3agr-AUX	1/2agr.-**stative**-**instrument /ɬ/**	**possessive *də***+root-TAMsuffix **classificatory *ɬ, s***+root-TAMsuffix
Yeniseic:	3p agr-AUX-TAMsuffix	1/2agr.-**stative**	**possessive *də*** + root ??**classificatory *ɯq*** + root

Finally, it is conceivable that the perfective/stative y-component and the *ɬ*-instrumental suffix may ultimately be cognate with the perfective *n* and progressive *ɬ* verbal suffixes examined above (cf. Table 13), with the latter associated with the *ɬ*-component of the classifier in Na-Dene by reanalysis based on homonymy. In any case, the appearance of these two elements after subject pronouns in the verb complex parallels in their function as suffixes on the verb root (or on the auxiliary in Yeniseic). Leer (2000:103) reconstructs the perfective/stative in Pre-Proto-Athabaskan as (*ñ*)*ə*, regarding the nasalization as an innovation. However, given that the affix form itself disappeared in Tlingit (with the change of post-classifier vowel to /i/ through progressive vowel assimilation), it is conceivable that the Athabaskan nasalized form was original.

There is some evidence that an *ɬ*-suffix and a nasal suffix operated in the nominal system of both language families, as well as in the form of aspectual suffixes after verb roots. While the Yeniseic stative/resultative suffix likewise has no nasal component, which would not lend support to this proposal, the nasal element in question might be the source of the connector element *ŋ* found in Yeniseic outside the verb complex: between a pronominal element and a postposition, such as Modern Ket *da-ŋ-al* 'from him', where *da* is the 3rd person possessive morpheme and *-aɬ* is the ablative formant. It was mentiond above that the Ket ablative formant is possibly cognate with the Athabaskan instrumental postposition *-ɬ (<*tɬ')*, as well as with the *ɬ*-instrumental suffix found in archaic Yeniseic noun formation, as well as in Na-Dene. The progressive verbal suffix and the nominal instrumental suffix do share cognate reflexes across both Yeniseic and Na-Dene. The Na-Dene valence-increase *ɬ*-classifier component likewise retains the same form, at least in

Athabaskan and Eyak. In this connection, the similarity between the Proto-Athabaskan perfective/stative suffix (attested in Athabaskan perhaps in its original form) and the perfective suffix found in Na-Dene after the verb root and in Yeniseic after the auxiliary is rather striking. It suggests that both suffixes may have originally been attached to verbal as well as nominal hosts in the two language families:

Table 23. ***Parallels in verbal and nominal uses of*** **ɬ-** ***and*** **n-*suffixes***

	suffix host	*nasal suffix*	*ɬ-suffix*
Na-Dene	auxiliary (conjugation marker):	-	-
	verb root:	(perfective aspect)	(progressive meaning)
	verb-internal subject pronoun:	?(perfective/stative)	?(transitivity increase)
	base for noun formation:	-	(derives instrument nouns)
	nominal form:	-	?(instrumental case formant)
Yeniseic	auxiliary (tense/mood marker):	(only telic verbs)	(all atelic verbs; some telic)
	verb root	?(in a few verb bases)	-
	verb-internal subject pronoun:	?(stative/resultative)	-
	base for noun formation:	-	(derives instrument nouns)
	nominal form:	?(*ŋ* before spatial case suffix)	?(ablative case formant)

While some of these parallels may prove unfounded, particularly as regards identification of the nasal perfective suffix with the perfective/stative prefix, or the identification of the Ket ablative suffix with the Na-Dene instrumental suffix, the very fact that such a proposal can be discussed with reference to elements obviously cognate in the two families exemplifies the value of Yeniseic and Na-Dene external comparanda for investigating the internal structure of each family.

To summarize the information presented throughout section 2, our examination of the oldest layers of Yeniseic and Na-Dene verb morphology reveal not only a system of homologies, but a system of systems. The parallels go deeper than general structural features and position class interdependence, since they also involve the parallel form and functions of cognate affixes. The affix forms themselves show regular sound correspondences and plausible functional/semantic matches. To explore these correspondences further, the next section examines cognates in basic vocabulary, revealing yet another "system of systems" in the form of interlocking consonant, vowel and prosodic correspondences.

3. *Dene-Yeniseic sound correspondences*

All accepted language families are evidenced not only by morphological homologies of the type shown in section 2, but also by cognates in basic vocabulary sufficient to establish systematic sound correspondences. These correspondences must agree across the morphology and the individual lexical cognates. By and large, sound correspondences in one pair of putative cognates cannot be contradicted by the correspondences involving the same sound in other pairs. For example, if /k/ corresponds to /h/ in cognate pair 1, then /k/ should correspond to /h/ in other pairs, as well, unless another regular sound law can be posited to account for the discrepancy (such as /k/ corresponding not to /h/ but rather to /g/ in the environment between vowels). Word lists

consisting of random look-alike pairs of words do not have this feature of interlocking sound correspondences and are therefore useless as evidence of genetic relatedness. If a list of look-alike vocabulary is compiled between languages that later turn out to be demonstrably relatable, it will probably contain cognates. Ruhlen's (1998) list of 36 putative cognate sets involving Yeniseic and Athabaskan/Eyak/Tlingit contains at least 75% complete coincidences, with perhaps six that include a least one genuine Yeniseic + Athabaskan/Eyak/Tlingit. All of the Haida words in the same list appear to be coincidental look-alikes with the various Yeniseic or AET comparanda. Unless languages are closely related, a comparative list of basic look-alike words is useless as the sole basis for arguing the case of genetic relatedness. These conclusions can only be drawn after sound correspondences are established. As it turns out, most Dene-Yeniseic cognates do not readily look like related words in the modern languages. They do not jump off the page to beat the researcher about the eyes and face. Only a detailed knowledge of the historical development of the sound system of both Yeniseic and Na-Dene can succeed in uncovering sound laws and therefore real cognates.

This section aims to show that Yeniseic and Na-Dene, already at this stage of my research, share a sufficient number of lexical cognates to begin to posit a system of such sound correspondences. The material is presented also with the goal of showing how Na-Dene comparanda can help solve otherwise intractable problems in the internal development of Yeniseic languages. The potential value of Yeniseic data for understanding Na-Dene internal developments is also highlighted. The order of presentation is from most difficult to most obvious. I start with sound correspondences that can only be detected based on a deep knowledge of the languages being compared. These mainly concern the development of coda consonants and vowel nuclei; only afterward do I move on to discuss the more obvious onset consonant correspondence. This seemingly counterintuitive approach was chosen because, in the case at hand, DY cognates demonstrating complex sound laws in the rhymes of syllables often have plausible onset correspondences, whereas the cognates demonstrating onset correspondences often look much less like cognates until the sound laws accounting for the differences in vowel nuclei and coda consonants have been made known. Section 3.1 begins by discussing a number of key rules of coda consonant and coda cluster reduction. Section 3.2 explains the rise of phonemic tone in modern Yeniseic on the basis of non-tonal elements in the syllable rhyme that are demonstrably present in Proto-Na-Dene or at least Proto-Athabaskan-Eyak. Subsections treat Yeniseic tonogenesis in syllables with short vowels and original obstruent codas (3.2.1), syllables with long (or full) vowels (3.2.2), and finally in syllables that seem to have been open or which ended in a sonorant sound (3.2.3). Section 3.3 moves on to discuss additional tonal complications that developed in some of the Yeniseic daughter languages based on elision either of intervocalic consonants or final syllables. This analysis is a necessary prelude to discussing syllable onset consonants, since some of the key distinctions show up in the form of which Modern Ket/Yugh tone developed from disyllable collapse. Section 3.4 discusses sonorants (nasals and approximants). It aalso returns to comparisons of sonorants in the onsets of verb prefixes, since, noted in section 2, a different set of correspondences exist in the consonant onsets of proclitics than occurs in word-initial onsets. All of the differences are due to the rule of clitic voicing, which preserve certain onset sounds, notably initial nasals, which were lost everywhere else. Finally, section 3.5

encompasses the remaining obstruent onset correspondences, examples for many of which will have already been informally introduced in the preceding sections on syllable rhymes.

Along the way I will try to point out particular areas where the fruitfulness of these Yeniseic and Na-Dene comparisons has depended crucially on prior discoveries by Athabaskanists regarding Na-Dene historical phonology and morphology. In the phonology, these include Krauss's explanation of the origin of Athabaskan tones (cf. Krauss (2005) for the most recent publication of this seminal article), as well as Krauss's breakthrough in understanding Athabaskan-internal correspondences involving a labialized velar proto-series of obstruents (Krauss 1964) and Krauss and Leer's (1981) seminal treatment of Na-Dene sonorants. In morphology, notworthy studies include Young & Morgan's (1943, 1988), Kari's (1976, 1989) and Leer's (1979, 2000) treatments of Athabaskan verb affix morphophonology, and finally Leer's (2008) most recent advances in discovering hitherto unnoticed sound correspondences linking Tlingit, Eyak, and Athabaskan. It is no exaggeration to state that without the availability of these invaluable materials, no amount of comparing Yeniseic with modern Athabaskan, or with Tlingit and Eyak, could have produced any meaningful result. I owe a similar debt of gratitude to my Siberian colleagues, but particularly to Heinrich Werner for his seminal treatment of Yeniseic tones (cf. Vajda 2001 for annotations of Werner's more than 100 publications on Yeniseic).

3.1. *Patterns of coda simplification in Proto-Yeniseic*

In the development of Na-Dene, as perhaps in many language families, codas tended to reduce more than onsets. The same is true of Yeniseic, but the reductions yielded different final consonants and also had varying effects on the preceding vowel. The differences between Yeniseic and Na-Dene, however, are proving to be surprisingly systematic. Perhaps most striking is the fact that glottalized obstruent codas before a short vowel in Proto-Athabaskan-Eyak regularly correspond to a Modern Ket high-even tone on a half-long vowel, transcribed throughout this article by a half-long mark /ˑ/: *tiˑk* 'snow and ice lying on the ground', Proto-Na-Dene *t'ik'*^{y} 'ice' (Leer 2008:19-20). Original short vowels not preceded by a glottalized obstruent appear in Modern Ket with an abrupt tone ending in a glottal stricture, transcribed here with the glottal symbol /'/: Ket *tə'q* 'finger', PA **ts'əq* 'finger' (Leer 2008:37). This correlation is only one aspect of Yeniseic tonogenesis, about which much more will be said below. For the present section it is important to note that glottalization of consonants disappeared everywhere in Yeniseic, but in several types of syllable structures the original glottal articulation of the obstruent left systematic effects on the syllable prosody.

Comparing Yeniseic/Na-Dene cognates can reveal the original coda that gave rise to the different phonological outcome in each family, and often elucidate the reason behind apparently disconnected morphological idiosyncrasies. The origin of numerous irregular noun plurals in Modern Ket finds cogent, and unexpected, explanation in light of the external evidence provided by Na-Dene. Evidence from Na-Dene comparanda concurs nicely with idiosyncrasies in Yeniseic morphophonology in cases where an original coda element elided in the singular, but left its trace in the suffixed plural form.

3.1.1. *Simplification of coda clusters beginning in a nasal*

All coda clusters consisting of a nasal + obstruent seem to have elided in Yeniseic. Modern Ket words with such clusters invariably derive from the recent loss of a final syllable vowel. This is most common in the Southern Ket dialect, where words with final clusters, such as *kəns* 'something bright in color' and *qɯːnt* 'ant', nearly always correlate with disyllables in the phonetically more conservative Central Ket dialect. The Central Ket pronunciations *kən-si* and *qəːn-tə* reveal that the second consonant of what is a coda cluster in Southern Ket must have recently been the onset of a second syllable. Coda clusters do not seem to have existed in Common Yeniseic at all.

Some of the clusters that simplified in earlier Yeniseic also existed in Na-Dene. However, in each family the clusters simplified quite differently, thus affording a perfect example of the how revealing the availability of external comparative evidence can be in helping reconstruct the internal development of a language family. Jeff Leer has recently discovered Athabaskan-Eyak internal evidence for root final clusters *nt'* and *nd* in Proto-Na-Dene, codas that are not observable in any modern Na-Dene language (2008:7). One word that ended in such a cluster is 'liver', for which Leer posits the Na-Dene proto form ~**sənt'* on the basis of PA **sət'* and Eyak *sahd*. In Eyak the nasal after a short-vowel nucleus presumably devoiced and reduced to a breathy phase before the apical obstruent, the breathiness being an otherwise inexplicable feature in the Eyak cognate. Possible circumstantial evidence for the former presence of nasals in Proto-Athabaskan comes from the observation that final nasals deleted before an obstruent suffix in the development of California Athabaskan (maybe ask example from Victor Golla). No modern Na-Dene form actually contains the nasal segment itself. On the Yeniseic side, Ket cognates to these roots retain the coda nasal, yet show no direct evidence of final /t'/ or /d/ (cf. Modern Ket *seːŋ* 'liver'). Yeniseic morphophonemic evidence, however, indirectly suggests the earlier presence of an additional consonant after the final nasal. Related plural forms sometimes contain an additional element, as in *seŋn-iŋ* 'internal organs', where a root-final obstruent, lost in the singular has presumably been nasalized between the coda nasal and the nasal suffix. Another possible cognate pair of this type is Ket dialectal *qo'n ~ ho'n ~ g^{h}o'n* 'spruce, fir, generic conifer tree, branches, needles' and PAE **Gand* 'conifer tree, needles', where Modern Navajo shows *gad* 'pine tree', Eyak *Ganhd* 'spruce needles'. Ther original word probably was a generic term for conifer needles and branches, used traditionally by the Ket as tent flooring and bedding. Notably, the Ket plural sometimes shows an excrescent /n/: *qonn-iŋ ~ qon-iŋ* 'conifer trees, branches' (cf. Porotova 2002:187); also *qundu* 'conifer branches used for tent flooring' (Porotova 2002:199), where original /d/ appears to have remained; this plural is probably a pronunciation of *qund-iŋ* since Ket speakers often do not enunciate the final nasal. Other possible cognates where the Yeniseic word ends in a final nasal, and the Na-Dene cognate ends in a final obstruent, with Eyak showing vowel breathiness. These include: Ket *qon-ij* 'dark, obscure, hidden' vs. PA **q'ʊs* 'cloud' and Eyak *q'ahs* 'cloud' (Krauss 2005:91); also perhaps Ket *qòn* 'gristle, cartilage' vs. PA **gəndz* 'gristle' (Krauss 2005:129), where nasalization remains in the full (rather than short) vowel nucleus, and the falling tone in Ket *qòn* must have derived from an elided fricative segment (*dz* > *s* > falling tone); see below. Similarly, although Ket *qon-* 'dark' does not occur as a separate

word to reveal its monosyllabic tone, its Yugh cognate does show falling tone: *qòːʰn*, pointing to the loss of a coda fricative. A final example of the Yeniseic loss of obstruents in coda clusters after a nasal can be seen by comparing PA **xeˑnʼtɵ̃ʼ* 'wart' (Krauss 2005:101) with Ket *hɯˑn* 'wart', where the plural also shows an irregularity suggestive of a former cluster: *hɯtn-əŋ* 'warts' (instead of the expected *hɯn-əŋ*).

Parallel evidence from internal reconstruction and external comparison agrees in pointing to the simplification of nasal + obstruent segments in both language families, with the nasal preserved in Yeniseic and the final obstruent in Na-Dene. It is my expectation that more such cognate pairs will be found. In the case of cognates involving final /t'/ or /d/, Yeniseic evidence directly confirms Leer's (2008) reconstruction of the initial nasal element of the coda cluster, which he made using Na-Dene internal evidence alone.

3.1.2. *Yeniseic-internal alternations between root-final* d *and velar* x, ɣ *or* k

A number of Yeniseic roots have final velar fricative /x/ in Kott or Arin, but apical plosive /d/ in Ket/Yugh; cf. Kott *-tʰex* and Ket *-tet* 'poke, hit endwise using a long object'. Some of the Ket/Yugh roots show an irregular morphophonemic alternation between *d* and velar *ɣ* or k when a plural suffix is added: Ket *-tet* vs. *-teɣ-in* (in verb forms with a plural subject); also Ket *diˑt* 'spruce grouse', *dekŋ* 'spruce grouses'. This suggests that the final velar was original. Na-Dene cognates, where available, confirm this: PA **dəx* 'grouse, spruce hen' (Krauss & Leer 1981:190). Similarly, compare Kott *-tʰex* and Ket *-tet* 'poke, hit endwise using a long object' with the Proto-Athabaskan cognate **tsəx* 'poke, act endwise with a rigid stick-like object' (Young & Morgan 1992:604).

This pattern only applies in the case of **x* after an original back vowel, since coda **x* (as well as **xʷ and *χ* fronted to **š* in Proto-Yeniseic and finally to apical /s/ in Modern Ket. Once again, irregularities in plural forms reveal which final s-sounds in Modern Ket derive from original **s* and which from a back fricative. The reflexes of original /s/ never merge with the nasal ending, so that the plural ending appears as a separate element: *kiʼs* 'foot' -> *kis-eŋ* 'feet'. But /s/ derived from a back fricative invariably causes assimilation of the nasal plural suffix, resulting in the creation of a falling tone: Ket *deˑs* 'eye' -> *dès* 'eyes' (cf. PA *neˑχ* 'eye'). Also cf. PA **deˑxʷ* 'river, sandbar' (Krauss 2005:84) and Ket *seˑs* 'river' but *sàs* 'rivers', where long distance assimilation changed the onset **d* to /s/ in Ket. The original form of 'river' was apparently preserved in the extinct Yeniseic dialects of Western Siberia, which left numerous hydronyms ending in *-tes*, *-tiš*, including the famous Irtysh River.

A topic for future research involves the issue of long-distance (onset + coda) consonant harmony in early Yeniseic. The Yeniseic cognates for 'river', which appear in hydronyms over vast stretches of western and central Siberia, show various alternations involving sibilants and /d/: cf. Ket *seˑs*, Yugh *čes*, as well as *tes ~ tis* from at least one of not several undocumented Yeniseic languages of western Siberia. Too few words show this alternation to be clear on the nature of the assimilation, though it most likely preceded from coda to onset, at least in Ket and Yugh, since the onset correspondence of

Ket *seˑs* and Yugh *čes* is unique to this word. The final vowel, as well as the anomalous consonant in Kott/Assan cognates Kott *šeti* and Assan *četi* 'river' appear to derive from a suffix /ti/.[7] The Pumpokol det 'river' shows a typical change of /s/ to /t/. The original Proto-Yeniseic form for 'river' was therefore probably something like **deiš* or **dais* and is a probable cognate to PA **deˑx*^{w} 'river, sandbar' (Krauss 2005:84), which appears in the combining form -*dežʷə'* in river names of Athabaskan provenance across a broad area of north central Canada. See Kari (1996:260) for a superb discussion of Northern Athabaskan hydronyms.

3.1.3. *Affricate coda reductions in Yeniseic*

Putative Na-Dene/Yeniseic cognates indicate that affricates reduced to continuants in coda position. Proto-Na-Dene coda **tɬ'* reduces regularly to Ket *l*: Ket *haˑl* 'hang suspended, be bent over' vs. proto-Athabaskan-Eyak **waˑtɬ'* 'hang suspended' (Young & Morgan 1992:46). Note, however that Modern Ket for some reason retains coda cluster *t* + *ɬ* where *ɬ* is the instrumental suffix (*tatɬ* 'fire sticks', *atɬ* 'mat', *aqpatɬ* 'diaper', etc. Proto-Na-Dene coda **ts* and **ts'* reduce to /s/ in Ket/Yugh and /š/ in Kott: Ket *haˑs* 'round shape, shaman's tambourine, disc (of full moon)' vs. PAE **wats'* 'round shape' (Young & Morgan 1992:49). The fate in Yeniseic of original codas **tš* and **tš'* (i.e., *č* and *č'*), if such sounds were indeed part of the proto-Yeniseic coda inventory, is not clear. Ket *quɯˑt* 'wolf', if cognate to Tlingit *ɢuč* 'wolf' (Naish & Story 1996:26) and Eyak *ɢuǯ* 'wolf' (Leer 1993:136), which lack a cognate in Athabaskan, would seem to point to these affricates reducing to /t/. In this paper I have generally kept mainly to cognates represented in Proto-Eyak-Athabaskan if not Proto-Na-Dene, avoiding potential cognates in only Eyak or Tlingit. This is due only to my poor knowledge of the internal history of these languages. Surely, Yeniseic-Tlingit cognates must exist – just as Yeniseic-Eyak or Yeniseic-Athabaskan cognates exist in cases where the other Na-Dene languages lost the word in questions.

3.1.4. *Partial collapse of the velar/uvular opposition in coda position*

Modern Ket has no syllable rhymes of the type -*iq,* -*ɯq* or -*uq*, with final uvular after a high vowel. Na-Dene cognates with these rhymes correlate with velar codas in Ket: cf. Proto-Athabaskan **džeˑq'* 'conifer resin, pitch' (Krauss 2005:100) but Ket *diˑk*, Yugh *dʲik*, Kott *čik* 'conifer resin, pitch'. The original uvular quality of the coda is preserved in Yeniseic the corresponding verb base: Ket *h-daqŋ*, Yugh *f-dʲaχŋ* 'glue O to a surface; stick, be sticky'. Also compare Proto-Athabaskan-Eyak **xʷəq'* 'hook shaped' (cf. Krauss & Leer 1981:110) with the Ket cognate *suˑk* 'back, return, push back, outer corner of a building'. This suggests that coda uvular stops became velars everywhere in Yeniseic after a high vowel. Uvulars became velars after front vowels in Ket too, so there is no Modern Ket rhyme -*eq* either (with -*iq* already being disallowed by the previous rule anyway). In Modern Ket, coda *k* and *q* are phonemically opposed only after the

[7] This vowel elides when 'river' is the second component of a hydronym: Kott -*šet*, Assan -*čet*, but remains in the plural of the free-standing nouns: Kott *šati*, Assan -*čati*.

vowels /*a*/, /*o*/, and /*ə*/. Note, however, that coda **k'* and **g* (unaspirated *k*) seem to have become uvular after the vowels /*a*/, /*o*/, and /*ə*/, where the contrast was still possible. This accounts for cognate pairs such as Ket *lə·q* 'squirrel pelt' and the Proto-Athabaskan variable coda root **ləg ~ *lək'* 'tree squirrel', where the high tone in Ket suggests an original glottalized coda. At present I have too few potential cognates to sort out the entire system ov correspondences involving velars and uvulars. Also missing here is any statement on the fate of original labialized velar coda **k'^{w}, *g^{w}, *k^{w}* and labialized uvular **q'^{w}, *ɢ^{w}, *q^{w}*. I should point out Leer's (2008:2) statement that the velar/uvular contrast in Na-Dene is extremely stable. The massive reductions that seem to have occurred in Yeniseic thus represent a radical departure from the picture established for Athabaskan, Eyak and Tlingit. Once again, further study of the Yeniseic developments may uncover ways in which the originally stable velar/uvular series contrast was nevertheless preserved.

3.2. *Yeniseic tonogenesis in light of Na-Dene comparisons*

Modern Ket and the recently extinct Yugh differ radically from all other language families of northern Eurasia in having phonemic tone. It is likely that two types of tone already existed in Proto-Yeniseic monosyllables, with a few additional tonal types developing in individual daughter languages through collapse of disyllables into monosyllables. Modern Ket has four monosyllabic tones. But even the original dual tonal opposition of ancient Yeniseic must have developed only after the split with Na-Dene, since all tonal features in modern Yeniseic can be associated with non-tonal features in the Na-Dene languages. In cases where individual Na-Dene languages also later developed tonal systems, this parallel process of tonogenesis often involved some of the same, originally non-tonal features that gave rise to tone in Ket; but the two parallel processes of tonogenesis themselves were different.

Yeniseic-internal reconstruction as well as external comparison with Na-Dene cognates can demonstrate that tone in Yeniseic developed from three different sources – two apparently in pre-proto-Yeniseic, and the third in only some of the Yeniseic daughter languages. Pre-proto-Yeniseic tone in short-vowel monosyllables developed on the basis of the contrast between glottalized vs. non-glottalized codas, exactly as it did in many Athabaskan languages (see Krauss 2005 for an elegant description). In long vowel monosyllables, by contrast, the type of coda was not a determinant. In such syllables, the length of the vowel nucleus itself evolved into high tone. Both these processes must have occurred in pre-proto-Yeniseic and can only be explicated using Na-Dene comparanda, which reveal the tonogenetic segments in question. Therefore, I will call them "primary tonogenesis". After the breakup of Common Yeniseic, additional tonal developments occurred in some daughter languages but not others. Certain types of disyllables reduced to a monosyllable, creating a new falling tone or rising-falling tone. Since these processes are obvious from Yeniseic-internal comparisons (as well as from comparisons with Na-Dene disyllables where such cognates exist), I will refer to them as "secondary tonogenesis". Yeniseic tonogenesis is least clear in open syllables (i.e., syllables that seem to have originally ended in a vowel) or in syllables ending in consonant that shows irregular morphophonological changes such as elision or other alternations during plural

suffixation. In the case of open syllables or syllables with unstable codas, the rhyme shap may not be clear even in the presence of a plausible Na-Dene cognate.

3.2.1. *Yeniseic tonogenesis in closed syllables with short vowels*

The original opposition of tone inherited by Proto-Yeniseic involved a contrast between high-even tone with half-length of the vowel nucleus (here called "high tone" and transcribed as /ˑ/) vs. abrupt tone on a short vowel with laryngealization or a glottal stop in its second phase (here called "abrupt tone" and transcribed as /’/). Short vowel syllables closed by a stable consonant (i.e., a consonant lacking any irregular morphonological changes and which can be taken as original) regularly developed high-even tone when originally followed by a glottalized coda obstruent. Coda glottalization, which is clearly attestable in the history of Na-Dene, apparently disappeared completely some time in pre-proto-Yeniseic, leaving high tone and half-length in the preceding vowel nucleus as its only trace. Table 24 shows some examples.

Table 24. ***The correlation of Yeniseic high tone with Na-Dene coda glottalization***

Yeniseic	Na-Dene
Ket *seˑŋ* 'liver'	PND ~**sənt’* 'liver'
Ket *tiˑk* 'snow, ice on the ground'	PND ~**t’ik’ʸ* 'ice'
Ket *dɯˑl* 'willow'	PA **č’ʷətɬ’* 'plant, shrub'

Short-vowels followed by an original non-glottalized obstruent or by a stable sonorant show abrupt tone in syllables where no later morphological processes triggered secondary tonogenetic developments. In short-vowel closed syllables that have not undergone secondary tonogenetic processes, the distribution of high vs. abrupt tone corresponds systematically to the type of coda reconstructable in the Na-Dene cognates. Table 25 shows some examples.

Table 25. ***The correlation of Yeniseic abrupt tone with Na-Dene non-glottal codas***

Yeniseic	Na-Dene
Ket *qo’n* 'conifer tree, branches'	PAE **ɢand* 'conifer tree, conifer needles'
Ket *tə’q* 'finger'	PAE **ts’əq* 'finger'
Ket *sə’n* 'dark blue or green'	PAE **xʷəñ* 'black'
Ket *ko’d* 'rump'	Eyak **gʷədə* 'rump', (PA **ʒʷaˑdə’* 'lower leg')

Abrupt tone is still the default tone in Modern Ket, with monosyllabic loans usually receiving it: e.g., *ho’p* 'priest' (< Russian *pop* 'priest').

Morphological developments on the Na-Dene side may have lengthened the vowel in some of these cognates (cf. PA **ʒʷaˑdə’* 'lower leg'), obscuring what was probably the original correlation. I suspect this might be true in the case of PAE **gʷeˑnə* 'daylight', where the corresponding Ket cognate *kə’n* 'light, bright' is a non-derived adjective and presumably correlates with an older adjective **gʷən* (?) no longer attested in Na-Dene.

The same is probably true in the case of the PAE verb root *G^{w}eˑd 'poke', which has a full vowel, and the Ket noun *qəʼd* 'poker, ray, spit for roasting meat', which has a short vowel; the corresponding Central Ket verb *qùːdə* 'poke, scratch, dig' shows some sort of secondary suffixation. The addition of a verb deriving suffix in Yeniseic *qùːdə* 'poke, scratch, dig' produced falling tone and a geminate vowel. In cases where the full vowel in Na-Dene represents an original diphthong or long vowel, the corresponding Ket tone is high with half-long vowel regardless of whether the coda was glottalized (see. 3.2.2 below).

In short-vowel closed syllables that have not undergone secondary tonogenetic processes in Yeniseic or vowel lengthening via morphological processes in Na-Dene, distribution of the two Yeniseic primary tones thus corresponds systematically to the type of coda reconstructable in the Proto-Athabaskan-Eyak cognates. Yeniseic syllables with full vowels also normally show high-even tone, and the original full vowel nucleus is normally present in the Na-Dene cognate.

One final point to note here is that there is no sign of Yeniseic ever having glottalized nasal codas. In all cognates to Na-Dene words with a glottalized coda *nʼ* or *ñʼ,* Yeniseic shows velar nasal *ŋ*. Crucially, the preceding vowel invariably has abrupt tone rather than the high tone that would have developed if the coda had originally been glottalized. Cf. Ket *həʼŋ* 'net' vs. PA **wənʼ-ɬ* 'net'; Ket *baʼŋ* 'land, earth' vs. PA **ñənʼ* 'land, earth'. The Yeniseic velar nasal *ŋ* is only found in coda position. I suspect it developed in Yeniseic from the loss of an original glottal stricture before glottalization produced high even tone; or glottal nasals in Na-Dene developed from another phonetic feature and are therefore secondary. (See below for more on nasal correspondences.)

3.2.2. *Yeniseic tonogenesis in primary monosyllables with original long nuclei*

Proto-Yeniseic monosyllables with Na-Dene cognates that seem to have contained a full (i.e., long, perhaps originally diphthongized?) vowel nucleus regularly show high-even tone, regardless of whether the coda was glottalized or not. These syllables, which I will call 'primary long monosyllables', often have a different vowel in Yeniseic than in Na-Dene (usually, Yeniseic has /i/). This difference may prove to shed light on the original vowel nucleus structure of such syllables:

Table 26. ***Yeniseic and Na-Dene cognates with primary long vowels***

Yeniseic	Na-Dene
Ket *siˑn* 'old'	PND ~**šxaːn* 'old age, old person, old' (Leer 08:5)
Ket *diˑn* 'emit light'	PAE **deˑñ* 'emit light'
Ket *diˑk* 'pitch, resin'	PA **ʤeˑq̃ʼ* 'resin'
Ket *kiˑn* 'maggot' (<**qiˑn*)	PAE **Guˑn* 'maggots'
Ket *suˑk* 'ochre, paint' (<**čuˑk*)	PAE **čiˑx* 'ochre'
Ket *teˑd*, Yugh *čed* 'husband'	PND ~**tseːdi* 'first one, elder' (Leer 2008:14)

The Yeniseic half-long vowels in syllables that correlate to long or half-long vowels in Na-Dene often show unusual morphophonemic alternations: cf. Ket *teˑd*, 'husband' *tat-n*

'husbands', offering another potential clue to the original quality of the vowel nucleus. Note that 'husband' in Ket (like 'elder' in Na-Dene) derives from 'head' plus a suffix. The origina form of the word head must have ended in a rhyme like /ai/ or /ae/ to have left the irregular vowel alternation found in the Modern Ket word. Such morphological clues may help reconstruct the origin of full vowels in Proto-Na-Dene as well as the form of original open syllable roots.

3.2.3. *Proto-Yeniseic open monosyllables*

Yeniseic tonogenesis in syllables ending in a vowel or in an unstable continuant with unusual morphophonemic properties is yet unclear. It is likely that in some cases the glottal stricture or half-length in the Modern Ket derives from an elided coda continuant of some kind. In cases where there are potential Na-Dene cognates, often only the onsets clearly match: Ket *tə's* 'stone' vs. PAE **tseˈ* 'stone'; Ket *tɯ'* 'head' vs. PAE **tsi'* 'head'; Ket *ki's* 'foot' vs. PAE **qe'* 'foot'; Ket *qɯ'j* 'birchbark' vs. PAE **q'əj ~ *q'iˈ* 'birch' (Krauss & Leer 1981:196); Ket *te:* 'thwart, crosspiece (in snowsled)', plural *tek-ŋ*, and Yugh *če:* , *ček-ŋ* vs. PND ~**k'ʸaw'* 'thwart, cross-brace' (Leer 2008:16); Ket *təɣa*, Kott *tʰa* 'breast' vs. PA **ts'uˈ* 'breast'; and Ket *hɯˑj* 'stomach' vs. PAE **wə-t'* 'stomach' (cf. Tlingit *hú* 'stomach'). Vowels in such syllables, just like vowels in primary long syllables, often show unusual morphophonemic alternations (cf. Ket *ki's* 'foot' vs. *kas-sat* 'sole of the foot'). Studying phonological alternations in open syllables might help reveal the original rhyme in both Proto-Na-Dene as well as Proto-Yeniseic. In some cases, the irregular Ket plural suggests coda simplification, as in Ket *dɯ'* 'hat' which is probably cognate with PA **č'əχd* 'hat'; cf. Ket plural *dɯˑn-eŋ* 'hats', where the excrescent half length and extra nasal segment /n/ probably represent the original coda cluster) Another possible cognate pair is Ket *di'* 'eagle' (plural *diɣin*), alongside *dàχ* 'eagle (in Ket mythology)'. Possible Na-Dene cognates are Tlingit *č'áak'* 'bald eagle' (Naish & Story 1996:27) and Ahtna Athabaskan *hwts'ek'* and Upper Tanana *tθ'ik* or *tθ'ak* 'osprey' (Jim Kari, p.c.).

3.3. *Ket/Yugh tonal developments connected with the reduction of disyllables*

Finally, in some Yeniseic daughter languages but not in others, certain types of disyllables elided or partly elided, reducing to a single syllable. This yielded high tone yet again, as well as two new tones (long rising/falling and long pharyngealized falling). The different tonal outcomes were apparently conditioned by what segments of the original structure were simplified, though this is hard to determine completely since some of the initial syllables in question were open syllables whose original coda is hard to determine. An example of Ket rising falling tone is *sáàl* 'spend the night' from **siˈ* 'night' + **haːɬ* 'spend, pass', preserved in Kott as the disyllabic structure *ši-gal* 'spend the night'; cf. the Na-Dene cognate elements ~**xʸe-* in words like 'evening', 'dusk' (Leer 2008:9), and PA **haːɬ* 'spend, pass time'. Another example is Yeniseic words for 'snowsled', the second element of which appears to be cognate with PA **hatl* 'snowsled': Ket *súùl*, Yugh *sóùr*, Kott *čegar*, Pumpokol *tsel*. The Pumpokol word shows that the original Ket/Yugh anlaut must also have been *č,* which reduced to /s/ before /u/, since original onset **s*

invariable became /t/ in Pumpokol. The origin of the first syllable *čе- is unclear, though it looks suspiciously like the word for 'crosspiece, thwart' (see above), which is cognate in both families and is used in both families as the term for crosspieces in sled construction.

Syllable collapse involving a first syllable that lacked an original consonant coda (apparently) yielded high-even tone rather than rising-falling tone. This makes sense, since rising-falling tone represents the preservation of two vowel nuclei, while high tone syllables have a single slightly longer nucleus. Ket gerundive forms (i.e, 'infinitives') derived using a prefix that represented an open syllable have collapse to a high-tone monosyllable in Modern Ket, but remain disyllabic in Yugh and Kott. One example is Ket *ɯˑn* 'cooking, boiling': Yugh *ə-χan* 'cooking, boiling'; Kott *au-gan* 'cooking, burning'; cf. also the Proto-Athabaskan cognate root **q'aˑn* 'burn, ignite'. Another is Ket *iˑn* 'standing (said of a single animate being)': Yugh *ʌ-fɯn* 'standing' (cf. the cognate PA root **heˑn* 'stand (said of single animate subject)'. Other examples of secondary high tone are compound nouns, where the first noun was an open syllable: Ket *təˑŋ* 'head hair', from *tɯ'* 'head' + *qaˑ* 'hair, fur' + *ŋ* 'plural'. An apparent cognate compound made of cognate roots occurs in Na-Dene: cf. PA **tsiː-ɣa'* 'head-hair', Tlingit *ša-χa`w* 'head-hair' (Leer 2008:14)[8].

An example of long pharyngealized falling tone is the Yugh gerundive form *ùːʰs* 'rowing', which derives from the peg prefix **i* + **ɢɯs* 'twist, row', in which the second syllable vowel apparently elided before the internal consonant, yielding a new coda cluster. The fricative of this cluster then became a pharyngealized second phase of the preceding vowel. In Southern Ket, the vowel length and pharyngealization are gone, leaving only falling tone: *ùs* 'rowing'. A partial cognate in Kott, with another gerundive-deriving prefix, shows the original second syllable: *ši-giš*, which is cognate with PA**ɢeˑtsˀ* ~ **ɢətsˀ* 'twist, wring'. Other instances of falling tone come from suffixes creating a new coda cluster beginning in a fricative: Modern Yugh *sùːʰɬ*, which apparently was derived by adding the instrumental suffix *ɬ* to the root syllable **suk* ~ *suɣ* ~ *suˑ* meaning 'back, middle, bent 180°'. In general, falling tone words in Yeniseic appear to have been morphologically complex. Cf. Southern Ket *ə̀ɣ* 'louse', Central Ket *ə̀ːɣi* 'louse', Yugh *ə̀ːʰk* (probably from *ək* 'tickle', a verb root still used in Modern Ket, plus nominalizing suffix *si*, still productive in Modern Ket. A similar nominalization in which the root has a possible Na-Dene cognate is the word for 'fingernail, claw': Southern Ket *ìn*, Central Ket *ìːni*, Yugh *ìːʰn*; cf. PA **yeˑn* 'sharp' with the Ket plural *yen-aŋ* 'claws', where the original onset and vowel seem to reappear. Other instances of falling tone cannot be reconstructed using Yeniseic-internal morphological comparisons, but point to cognancy with disyllabic words in Na-Dene: Ket *kùn*, Yugh *kùːʰn* 'wolverine'; cf. Eyak **kəna's* 'wolverine' (Krauss ms:759) and PA **-čīˑs* (Krauss & Leer 1981:194), where onset **č* derives from earlier Proto-Athabaskan-Eyak **kʷ*. Also Ket *tìx*, Yugh *čìːʰk* 'snake' vs. PAE **tɬ'əɣəsʷ* 'snake, leech, eel'.

[8] I thank Jeff Leer for pointing this parallel out to me in August, 2006.

To summarize, data from Yeniseic tonogenesis, never fully explained in previous publications, offers a wealth of intricate phonological and morphological evidence supporting a genetic link between Yeniseic and Na-Dene.

3.4. *The proto-sonorants in onset and coda positions*

The proto-sonorants in Na-Dene were fundamentally described in Krauss & Leer (1981), a work showing that Proto-Na-Dene (or at least Proto-Athabaskan-Eyak) had the following six sonorants: **w*, **y*, **n*, **m*, **ñ ~ ỹ*, and **m ~ ŋ^{w} ~ w̃*. There was also a zero onset in some syllables, variously realized as Ø, /h/, /w/, or /y/ depending on the following vowel quality and the morphological environment. The nasals **n'*, ** ñ'* may appear glottalized in auslaut, as well. The lateral fricative /*ɬ*/ is an obstruent in Na-Dene.

It is important to note that modern Yeniseic has no sonorant-initial words, except where the initial is clearly a proclitic or verb prefix. The word-initial glides /w/ and /y/ are merely epenthetic elements before /u, o/ and /i, e/, respectively, having in some instances combined with the following vowel to raise its articulation. The lateral *ɬ* is also an obstruent and will not be dealt with here, though it allophonically voices to /l/ in coda position after high or rising-falling tone. Yugh shows the allophone /r/ in the same position.

The Yeniseic correspondences to Na-Dene sonorants, in as much as they have been worked out, appear to be as shown in Table 27. The segment **w* in PAE may represent an original sonorant **w* as well as the reduction of an earlier Proto-Na-Dene fricative **h^{w}* in cases where Tlingit shows initial *h* (as in words for stomach). Instances of zero-onsets in Na-Dene seem to correlate with Ket /h/ and Yugh /f/: cf. Yugh *ʌ-fɯn* 'standing', and the synonymous Ket *iˑn*, derived from **i-hɯn* through regular rule of disyllable reduction. The same epenthetic consonant appears in the PA cognate **heˑn* 'stand (said of single animate subject)'. In other words, the epenthetic consonant at the beginning of zero-onset syllables fell together in Yeniseic with the reflexes of onset **x* (cf. section 3.6 below). Note also the distinct reflexes in onset vs. coda position and the universal denasalization that occurred in Yeniseic root onsets. In cases where the clitic voicing applied, however, this process seems to have preserved the original nasal in Yeniseic.

Table 27 ***Dene-Yeniseic sonorant correspondences***

Na-Dene		**Yeniseic (Ket)**
**w*		*Ø, u* (or *h^{w}* where <**h^{w}*)
onset	PAE**weˑg^{w}* 'boil, cook by boiling'	*(w)u'k* 'broth'
	PAE**wə-t'* 'stomach'	*hɯˑj* 'stomach' (pronounced [*h^{w}əˑj*])
coda	PND~**k^{y}iːw* 'in front of' (Leer 2008:14)	*tɯˑ* 'downriver' (open syllable, high tone)
**y*		*Ø, y*
onset	PAE**yeˑn* 'sharp'	(y)*ìn* 'claw', *yen-aŋ* 'claws'
coda	PND~**k^{y}a(ː)y* 'stone' (Leer 2008:15)	*tə's* 'stone', *tə'ŋ* 'stones' (unstable /s/)

*n		d (root anlaut), n (clitic) n (coda)
onset	PAE*niːx 'move hand to' (KL 1981:199)	dɪj ~ nəj 'touch, disturb by moving'[9]
	PAE*nəqʼ 'swallow' (KL 1981:198)	doˑq 'swallow' (animate object)
	PAE*neˑχ 'eye' (Krauss & Leer 1981:199)	deˑs 'eye'
clitic	PA*nə 'round shape prefix	n- 'round shape prefix'
coda	PND~*qʼaˑn 'burn, ignite'	Ket -qan 'cook, burn, boil'

*ñ		b (root anlaut), n (clitic) n (coda)
onset	PA *ñənʼ 'land, earth'	Ket/Yugh baʼŋ 'land, earth', Kott paŋ
clitic	PA*ñ 'perfective suffix	n 'perfective affix'
coda	PAE *deˑñ 'emit light'	Ket diˑn 'emit light'
	PA *šʷəñ 'black'	Ket səʼn 'dark blue, dark green'
	PA *łaˑñ 'many'	Ket oʼn ~ òn 'many',

Although palatal *ñ and apical *n fell together in auslaut, morphophonemic evidence from Ket plurals suggests they were once distinct. The plural suffix /n/ merges with final stem consonants that derive from a palatal sound. In the case of coda /n/ from *ñ, the plural suffix becomes syllabic /n/ in Modern Ket: e.g. kùn 'wolverine', kunn̩ 'wolverines' (cf. PAE *kʷəñ 'wolverine', in contrast to Ket kiˑn 'maggot', kineŋ 'maggots' (cf. PA *ɢuˑn 'maggots', with original apical coda /n/). This distinction is also paralleled by the fact that /s/ from original apical *s never merges with the plural suffix, but Modern Ket /s/ from a back fricative (presumably through a stage involving a palatal articulation) does: cf. Yugh des 'eye', dèːʰs 'eyes' (presumably < deˑss < deˑsn; cf. PA *neˑχ 'eye').

In root-initial position, however, *ñ seems to have fallen together with *ŋʷ rather than *n. Though the evidences is sparse, both seem to correspond to Ket/Yugh /b/ and Kott /p/: e.g., Ket/Yugh baʼŋ 'land, earth', Kott paŋ vs. PA *ñənʼ 'land, earth'. Ket baˑt 'face' suggests a proto-form of *ñatʼ (?<*ŋʷatʼ), when in we in fact find an initial /n/ Athabaskan, as in PA *nə-neˑnʼ (Krauss & Leer 1981:199). If these Na-Dene and Yeniseic words for 'face' have any historical connection, they would suggest assimilatory deformation of the one or both stems. Interesting in this connection is Arin bint 'face'.

Nominal elements incorporated into the finite verb complex might also shed light on this problem, since verbal affixes in Ket preserve anlaut nasals. Athabaskan uses an *n*- prefix deriving from 'face' in the qualifier zone, while Ket has ŋt (?< 'face') in the same position: a-ŋt-b-dop '3rd person singular subject gulp down, swallows object quickly

[9] The alternate stem form here probably derives from the fact that the given verb is often used with a thematic prefix *n*- (possibly a shape prefix meaning 'around'), and does not represent alternate denasalization of a root anlaut. Shapes prefixes with the form *n*-, being proclitics by origin, never denasalize. In fact, they regularly cause long distance progressive nasalization of the inanimate prefix b-: *namadij* 'it is shaking, being disturbed' (*n*- shape, *a*- tense. m- *(=b)* inanimate prefix, *a*- stative resultative or intransitive marker, -*dij* 'shake'. The perfective past-tense marker /n/ also causes this: imnuqo 'it dies' (i 'peg prefix', m (=b) inanimate prefix, *u*- stative resultative (u before /q/), -*qo* 'die'; cf. the present tense of the same verb: *ibqo* (or *ibuqo*) 'it dies'.

(e.g., as a bird does when throwing back its head)', where a = possessive prefix 'his', *ŋt* may be the incorporated body-part noun 'face', *b-* inanimate prefix, and *-dop* is the base meaning 'drink'. It is unclear whether the Yeniseic and Na-Dene words for 'face' are true cognates, but the parallels are noteworthy. Also interesting is the Ket word *ba't* 'truth', which is almost certainly somehow related to 'face', since the Ket divined an affirmative answer from the spirits by throwing a bear paw or *Allel* image into the air and interpreting a face-up (or palm up) landing as an affirmative answer to a yes-no question.

Yeniseic correspondences to coda **ŋ^{w}* is more problematic, perhaps partly because this sound is relatively uncommon in the PAE cognate sets provided by Krauss & Leer (1981). Three potential Yeniseic cognates to Proto-Athabaskan roots reconstructed as having coda **ŋ^{w}* are somewhat speculative. The first is Ket *dɯˑn-t ~ dɯn-da* 'dragonfly', where the velarized quality of the original nasal might be preserved in the high-back vowel articulation; cf. PAE **daw̃'* 'fly' (Krauss 2005:129). The vowels /ə/ and /ɯ/ normally occurs after /d/, /t/ only in cases where these consonants represent original affricates or palatals, in which case Ket /*d*/ normally corresponds to Yugh /*d*^{j}/, which is not the case here (cf. Yugh *dʌn-abej* 'dragonfly'). Another example is the Ket word *saŋɢaŋ* 'spark', a probable compound that may contain cognates to the PAE roots **səŋ'^{w}* 'star' (Krauss & Leer 1981:193) + PAE **q^{w}ən'* 'fire'. The phonology works perfectly, except for the loss of the labialized initial in the second root, but the semantics is speculative in the absence of any other Yeniseic occurrences of the element *saŋ-*. As for PAE**q^{w}ən'* 'fire', it may have a partial Yeniseic cognate in the Ket syllable *-qoŋ*, in many meaning 'daylight, daytime': cf. *qòŋ* 'daytime' (the falling tone probably representing an elided suffix), *enqoŋ* 'today' (*eˑn* 'now' + *qòŋ* 'daytime'). In the third possible cognate candidate, the vowel quality preceding the coda again might suggest a labialized nasal coda: Ket *-dun* 'make a loud noise', PAE *-dəŋ'^{w}* 'noise' (Krauss & Leer 1981:193). The verb base meaning 'drink object' may belong here, as well: Ket *-dop*, PA*-*naˑŋ^{w}* (Krauss & Leer 1981:198).

The much rarer Yeniseic coda /m/ does not occur in any words with potential Na-Dene cognates and its origin remains a mystery: Ket *teˑm* 'goose', Yugh *čem* 'goose', *iˑm* 'pine nuts', *qaˑm* 'arrow', *duˑm* 'bird', *tuˑm* 'dark'. The fact that it is suspiciously often preceded by high tone might offer some clue to its origin.

Finally, in all cases where Na-Dene cognates to Yeniseic words contain a glottalized nasal coda (except for *ŋ'^{w}* in the speculative comparisons made above), this segment appears in Ket as velar /ŋ/. Also, in primary short syllables, the vowel shows the reflex of having been followed by an originally non-glottalized coda.

Table 28. ***Possible Yeniseic cognates to Na-Dene words with glottalized nasals***

Na-Dene	Yeniseic
PA*q^{w}ən'* 'fire'	Ket *qòŋ* 'daytime'
PA**wən'-ɬ* 'net'	Ket *hə'ŋ* 'net'
PA **ñən'* 'land, earth'	Ket *ba'ŋ* 'land, earth' vs.

This correlation fails to apply only in the few known cases of ancient coda clusters of nasal + obstruent, where patterns of assimilation or dissimilation probably occurred. The PND root ~*sənt'* 'liver', reconstructed by Leer (2008:7) with non-glottalized nasal, would presumably have been ~*sən't'* or ~*səngt'* to give Ket *seˑŋ* 'liver'. Conversely, PA **xeˑnˈtsˈ* 'wart', reconstructed by Krauss & Leer (1981:198) with glottalized nasal, would presumably have been something like **xeˑntsˈ* to give Ket *huːn* 'wart'. It is overwhelmingly likely that Pre-Proto-Yeniseic codas consisting of a nasal followed by a glottal stop or any guttural segment (*χ, x, k, g*, etc.) yielded a simple velar nasal coda in later Proto-Yeniseic. This may account for the velar nasal in Yeniseic words for 'people': Ket *deˈŋ*, Yugh *dʲeˈŋ*, Kott *čeəŋ* (note that tone was not transcribed as such in Kott). These words probably represent a combination involving a thematic prefix **də* and a root meaning 'person'; cf. Modern Ket/Yugh *-iŋ* 'person' in possessive constructions such as *da-iŋ* 'his person', used in existential constructions. Given the origin of Yeniseic coda *ŋ* from a nasal + guttural segment or glottal stop, however, it would appear most likely that Yeniseic words for 'people' are cognate with Eyak *də-χunh* 'person' rather than with the Athabaskan collective *dine* 'people'. This would counter Trombetti's (1923) assertion that Ket *deˈŋ* and Athabaskan *dine* are cognate. Athabaskanists derive *dine* 'people' from *də* + *neː* 'move nomadically' (Jim Kari, p.c.). The Modern Yeniseic word for 'people' - Ket *deˈŋ*, Yugh *dʲeˈŋ*, Kott *čeəŋ* - may have originally been singular. Evidence for this comes from the Ket singular noun *daŋgols* 'male ancestor image', probably from *deˈŋ* + *ol* 'covering, receptacle' + *si* 'nominalizing suffix', as well as uses of *deˈŋ* in the singular as a general form of address to any close affinal relative (Alekseenko 1967: 159).

Except for the rather solid identification with Yeniseic simple coda /ŋ/ with a glottalized nasal coda in Na-Dene, and the straightforward correlation between the apical nasal coda /n/ in both families, the correspondences involving other nasals seem at this stage rather thinly attested if not entirely lacking.

3.4. *Dene-Yeniseic obstruent onset correspondences*

Cognates in basic vocabulary are sufficient to support many correspondences between Na-Dene and Yeniseic obstruents, at least in onset position. As within Na-Dene itself, onsets are more straightforward than codas, since additional phonological processes operated to erode word-final consonants. The Proto-Yeniseic sound inventory has not yet been reconstructed with certainty, but much has already been learned from comparing consonant correspondences from Ket, Yugh, Kott, Assan, Arin, and Pumpokol.[10]

In Modern Ket, with only 12 consonant phonemes – the sonorants *n, ŋ, m, j*, and obstruents *b, t, d, s, ɬ, k, q, h* (Vajda 2004) – show evidence of a massive conflation of

[10] Heinrich Werner and I are in the process of writing a comprehensive "Etymological dictionary of the Yeniseic languages," which will summarize all that is known about Yeniseic linguistic history based on family internal comparative evidence. This research is being supported by the Linguistics Division of the Max Planck Institute of Evolutionary Anthropology, Leipzig. Completion of this project will vastly aid in the comparisons I am making with Na-Dene.

consonant articulations. This is obvious from Yeniseic-internal comparisons alone, where the Kott and Yugh correspondences to both Ket /d/ as well as /t/ reveal the presence of what must have been several distinct phonemes Proto-Yeniseic. Another feature left over in Modern Ket from the conflation of alveolar affricates, post-alevolar affricates, and palatal stops with apical *d* and *t* – aside from their sometimes still phonemically contrastive reflexes in Yugh and Kott – involves patterns in vowel quality. Modern Ket has seven vowel phonemes – *i, e, a, ə, o, ɯ, u* – each found in four different monosyllabic tones. The vowel /ɯ/ is invariably high back unrounded, while /ə/ is realized phonetically as mid-high back unrounded [ɤ] under high tone and mid-low back unrounded [ʌ] elsewhere. There are no diphthongs. Pre-Proto-Yeniseic may have originally had diphthongs, which developed into half-long vowels with high tone. It is not yet possible for me to be certain about the original vowel quality in original full vowel syllables. In short vowel nuclei, there were apparently only five vowel phonemes: *i, a, ə, o, u.* The unrounded mid-vowel phoneme was realized in Common Yeniseic as front [e] after original alveolars (**t*, **d*, **s*, **ɬ*) and voiced palatals **j*, **ǯ* (< **g*^{y} or **g*^{w}): Ket *dek-n* 'spruce grouses' vs. PA **dəx* 'spruce hen'; and Ket *seˑŋ* 'liver' vs. PA**səd* 'liver'. The same phoneme was realized as [ʌ] after **ts*, **č* (< **k*^{y} or **k*^{w}), plain and labialized velars, plain and labialized uvulars, **h*^{w}, as well as after **l* (< **ɬ*), which was probably velarized at this stage.

The alternation between modern Ket /e/ and /ə/ after /s/ likewise helps indicate where /s/ derives from an original *s or **x*^{y} (palatal or front-velar fricative) on the one hand, or from the labialized velar **x*^{w}, on the other. Front /e/ appears in Ket cognates to Na-Dene words originally containing apical fricative onset **s*: Modern Ket *seˑŋ* 'liver' (PA**səd*, Eyak *sahd* 'liver'). Front /e/ likewise appears in Ket cognates to Na-Dene words originally containing onset **x*^{y}: Modern Ket *sɐn-iŋ* 'shaman' (PA**sən* ~ *yən*, 'sing shamanistically', Eyak *xiːl* 'shaman'). But /s/ deriving from **x*^{w} is followed by /ə/ in Modern Ket: *səʼn* 'dark blue or green' (PAE**x*^{w}*əñ*, 'black'). Back /ə/ likewise occurs in Modern Ket after an original plain velar fricative **x*. or after the /h/ that correlates with Proto-Athabaskan *w (presumably from earlier **h*^{w}). All of these back fricatives yielded /h/ in Ket and /f/ in Yugh. Compare Ket *hɯˑn* 'wart', Yugh *fɯn* 'wart' with PA **xeˑnʼtsʼ* 'wart' (Krauss 2005:101), and Ket *həʼŋ* 'throw net', Yugh *fəʼŋ* 'throw net' with PA **wənʼ-ɬ* 'net, large game snare'.

Rules involving vowel raising continue the same pattern. The articulation [e] raises to [i] under high tone before an original palatal consonant (cf. Modern Ket *diˑt* 'spruce grouse'; cf. *dekŋ* 'spruce grouses' < PY **deç*; cf. PA **dəx* 'spruce hen'. But [ə] raises to [ɯ] under high tone before a palatal consonant. Cf. Modern Ket *hɯˑj* 'stomach', but *hə̀j* 'stomachs', pronounced [*hʌ̀j*] and PA **wətʼ* 'stomach'. When apicals and post-alveolar affricates fell together, difference between [e] ~ [ə] and [i] ~ [ɯ] became phonemic. Vacillations in Modern Ket words such as *tɯjiŋ* ~ *tijiŋ* 'growing' suggest that /ɯ/ may have changed to /i/ sporadically between an alveolar and a palatal; the same process may account for Ket *diʼ* eagle, which should be **dɯʼ* if derived from an original **č* onset,

though the vowel may have originally been /a/ (cf. Ket *dàq* 'mythological eagle'. Modern Ket also shows vacillation between /e/ and /a/ (presumably < /ə/) before a /t/ onset derived **ts* or **ts'*: e.g. Ket *-ted*, *-teɣ*, *-tat* 'hit endwise with a long object; cf. PA **tsəx* 'poke, act endwise with a rigid stick-like object' (Young & Morgan 1992:604). It is likely this vacillation signals the original presence of /ə/.

To summarize, Yeniseic-internal evidence from consonant contrasts in the various daughter languages, as well as the appearance of /e/ vs. /ə/ and /i/ vs. /ɯ/ can be combined with evidence from Na-Dene comparanda to show how Yeniseic onsets correspond with the vastly more complicated obstruent systems of Na-Dene.

3.4.1. *A palatal consonant series in Dene-Yeniseic*

An important breakthrough made by Jeff Leer in his work on establishing regular sound correspondences between Tlingit and Athabaskan-Eyak (cf. Leer (2008:7-21) for his most recent presentation) was the discovery of a new series of consonants in Proto-Na-Dene, which e called the 'palatal series'. These consonants may have been articulated as genuine palatal obstruents [*ɟ, *c', *c, *ç*] or possibly front velars [g^y, k'^y, k^y, $*x^y$]. Leer's discovery unexpectedly led to a parallel breakthrough in my efforts to show regular correspondences between Yeniseic and Na-Dene. Among other things, the existence of this series explains why the Athabaskan-Eyak TS-series sometimes correlates with Tlingit TS, but but at other times with Tlingit /š/ or /k. The latter, previously unexplained, correlation can be seen in Na-Dene words for 'head' and 'rock', among others: PA **tsi'* 'head' and Eyak *tsiŋ'-də* 'neck' (found incorporated into verb form), but Tlingit *šá* 'head' (Leer 2008:14). Note the parallelism with PA **tseː* 'stone' and Eyak *tsaː* 'stone' but Tlingit *ša`* 'mountain' (Leer 2008:15). Leer (2008:14-15) reconstructs the Proto-Na-Dene forms of both words with a palatal onset (IPA symbol /c/, Leer's practical orthography symbol "ky"). The regular TS correspondence across Na-Dene are found in words for 'finger', 'breast/teat', 'hit' endwise' and many others (though sometimes the Tlingit reflexes of PND **ts'* show unexplained variation between *ɬ'* and *tɬ'*: PAE **ts'əq*, Tlingit *tɬ'îɢ* 'finger'; PAE **ts'uˈ*, Tlingit *ɬ'a`* 'teat'; and PAE **tsəx*, Tlingit *tsaɢ* in various verbs meaning 'hit endwise, poke'.

As it turns out, the Yeniseic cognates to these two groups of Na-Dene words display a strikingly parallel dichotomy. Though all the words in Modern Ket have onset /t/, when cognate forms are added from the extinct Yeniseic languages (where available), it becomes obvious we are dealing with two different proto-sounds. Yeniseic words that correspond to Na-Dene words with the original TS-series onsets have one set of reflexes, while cognates to Na-Dene words with onsets deriving from proto-palatals show a distinctly different set of reflexes.

Table 29. ***Reflexes of proto-palatals vs. apical affricates in Yeniseic and Na-Dene***

proto-palatal series

	Ket	Yugh	Kott	Arin	Pumpokol	PA*	Tlingit
'head'	*tɯ'*	*čɯ'*	-	*ke*	-	**tsi'*	*šá*
'stone'	*tə's*	*čə's*	*šiš*	*kes*	*kit*	**tseˈ*	*ša`* (mountain)

*proto-apico-affricate series (e.g., original *TS series)*

'finger'	*tə'q*	*tə'χ*	*t^hok*	*to*	*tok*	**ts'əq*	*tɬ'î$_G$*
'breast/teat'	*təɣa*	*təga*	*t^ha*	*te*	*tike*	**ts'u˙*	*ɬ'à*
'poke'	*ted~teɣ*	*tet^j~teg*	*t^hix*	-	-	**tsəx*	*tsa$_G$*

The back vowels /ə/ and /ɯ/ in Yeniseic words with reflexes from original palatals (Ket *tɯ'* 'head' and *tə's* 'stone') suggest that the proto-palatal stops must have become affricates in Proto-Ket-Yugh to yield mid-vowel /ə/ instead of /e/. This also reveals a crucial difference in shift of place of articulation in early Yeniseic between fricatives vs. stops. In Na-Dene, entire series tended to shift their place of articulation forward in unison; for example, in much of Athabaskan, all unrounded uvulars became velars, and the original velars shifted forward to an alveolar or post-alveolar articulation. In the history of Yeniseic, different rules sometimes apply for stops vs. fricatives of the same series. Also, there are significant splits among the occlusives (obstruent stops) depending on whether the sound in question occurred before a front vowel. With fricatives, the quality of the following vowel was not a determinant. Palatal fricative *x^y became /s/ everywhere in Yeniseic, as did the labialized velar fricative *x^w, regardless of the preceding vowel quality (though with preservation of original back [ə] articulation of a following unrounded mid vowel. Occlusives – but not fricatives! - fronted before an original front vowel; before a back vowel or in coda position, however, they retained their place of articulation or even became backed, depending on the series. This rule allows us to posit precise correspondences in obstruents between Yeniseic and Na-Dene, supported by numerous cognates. More will undoubtedly be discovered later, as my fledgling knowledge of Na-Dene progresses. These rules apply except in cases where specific auslaut deformation rules altered coda consonant shape.

3.4.2. *Dene-Yeniseic obstruent correspondences*

The next several subsections demonstrate how fricatives behaved differently than occlusives in some of these series. The lateral onsets *ɬ and *tɬ' will be dealt with last. Note that I do not posit any CH-series. I will suggest that the sounds reconstructed for Proto-Athabaskan-Eyak as representing the post-alveolar affricates *dž, *č', *c do not constitute a separate series in Pre-Proto-Na-Dene (or in Pre-Proto-Yeniseic). Rather, I will argue that these sounds, inherited into Proto-Athabaskan-Eyak, derive from an earlier palatalization of the labialized velar series before original front vowels (something that happened later, in early Athabaskan, to all remaining labialized velars to produce a new retroflex series. Yeniseic comparative evidence suggests the postalveolar and labialized velar series in Na-Dene languages both originated from a single series.

The tables in each section below give the correspondences for each sound, accompanied by a few sample cognate sets. The tables are followed by commentary that sometimes includes additional cognates supporting these correspondences. Following Athabaskanist tradition, the Na-Dene transcription uses voiced obstruent symbols for *voiceless* unaspirated sounds, while the corresponding voiceless symbols transcribe voiceless *aspirated* sounds. The use of symbols *d, t*, etc., in transcribing modern

Yeniseic, however, signifies an actual difference between voiced vs. voiceless. Once again, I avoid creating Proto-Yeniseic forms at this stage, relying instead on actual forms that exist (or were documented as existing) in the Yeniseic daughter languages. The symbols for proto-sounds on the Na-Dene sides of these charts basically reflect the well-understood Proto-Athabaskan-Eyak, except in the case of the palatal series, where they represent Leer's recent discoveries in Proto-Na-Dene.

3.4.2.1. *T-series obstruents: *d, *t', *t*

Dene-Yeniseic correspondences involving the original alveolar (or dental) series: **d* (voiceless unaspirated stop), **t* (voiceless aspirated stop), and alveolar fricative **s* are the most straightforward. The occlusives and fricative in this series all retained their original place of articulation (either apico-dental or apico-alveolar) in both Yeniseic and Na-Dene. In the remaining series, the occlusives (voiceless unaspirated stop, voiceless aspirated stop) developed a different place of articulation than the originally corresponding fricative in the same series. This bifurcation occurred in Yeniseic but not in Na-Dene, where the fricative/occlusive difference played no differential role in place of articulation shifts. Note that the denasalization of onset /n/ to /d/ must have occurred before the breakup of Common Yeniseic, as witnessed by cognates for 'eye': Ket *deˑs*, Yugh *des*, Pumpokol *det* vs. Kott/Assan *teš* and Arin *tij*.

Table 30. ***Dene-Yeniseic T-series correspondences***

Na-Dene Modern Yeniseic

*d → *d* (Ket, Yugh, Pumpokol), *t* (Kott, Arin), with following /e/ and /i/ rather than /ə/ and /ɯ/ in Ket/Yugh (except possibly in cases where a labialized coda cold have affected vowel quality, as in 'fly')

PA**deˑñ* 'emit light', Ket *diˑn* 'blink, emit light'

PA**dəx* 'spruce hen', Ket *diˑt*, Yugh *dit* 'spruce grouse'

PA**daw̃* 'fly', Ket *dɯˑn-də* and Yugh *dʌn-abej* 'dragonfly'

PA**dəɬ* 'blood', Ket *del* 'blood' (only in *del-es* 'blood-sky (taboo designation for the evil "God of the West" in Ket mythology)'

Na-Dene Modern Yeniseic

*t' → *t* (Ket, Yugh, Pumpokol), t^h (Kott/Arin), with following /e/ and /i/ rather than /ə/ and /ɯ/ in Ket/Yugh

PA**t'eˑG* 'raw' (Krauss 2005:128), Ket *tuˑ* ~ *tuɣ* 'raw', Kott tHu 'raw'

PND~**t'ikʼʸ* 'ice', Ket *tiˑk* and Kott $t^hi{:}k$ 'snow, ice on the ground'

Note PA **t'ut'* 'suck', where onset **t'* correlates with zero in Yeniseic: *uˑt* 'suck' (e.g., Kott *ba-'ut* 'he sucks it'). This suggests the PA onset was an ancient prefix (perhaps parallel to non-valence usage of the *d*-classifier in verbs meaning 'drink'

Na-Dene		Modern Yeniseic
*t	→	t (Ket, Yugh, Pumpokol), t^h (Kott/Arin), with following /e/ and /i/ rather than /ə/ and /ɯ/ in Ket/Yugh

PA*te˞(ñ) 'animate lies prone', Ket -tn, Kott te:n 'animate lies down'

PA*tu˞ 'water, liquid' (Krauss 2005:82), Ket tu ~ to in compounds, where it designates 'liquid, water, moisture': Ket to-qoj 'dry up' (qoj = dry): tu-t-a-b-qoj 'it dries up (< water-thematic.consonant-present.tense-inanimate-dry), possibly also Ket to˞ji 'stream'

PA*təñ 'handle'; Ket/Yugh tɯ'n 'kettle', also perhaps the element -tn in words denoting tools with a handle, such as haba-tn 'spoon with a broad flattened tip for kneading dough' (ha 'perpendicular')

Na-Dene		Modern Yeniseic
*s	→	s (Ket, Yugh, Arin), š (Kott), t (Pumpokol), with following /e/ and /i/ rather than /ə/ and /ɯ/ in Ket/Yugh

PND~ *sənt' 'liver' (PA*səd, Eyak sahd 'liver') Ket se˞ŋ 'liver'

PA*sil, 'steam, vapor' (YM92:467), Ket sil- in silgit 'molten fat' (sil + kɯ't 'fat', si˞l ~ si˞li 'summer' (< sil + i ?); note also Navajo -zil 'beat fat, liver, brains into skin' (YM92:744); also note the Koyukon cognate leɬ 'hot' (Jim Kari, p.c.)

PA*sa˞x, 'sand, crumbled fragment' (YM92:739; Krauss05:84) Ket/Yugh si˞ 'small fragment'; note Yugh sifəs 'pile of small fragments' (Ket siis 'pile of small fragments'), where the original second syllable -fəs is cognate with PA*xəs 'pile' (YM92:467), and the original first syllable si- with PA*sa˞x 'sand, crumbled fragment'[11]

PA*səs, 'belt, sash' (YM92:467) may turn out to be somehow connected with Yeniseic words for rawhide: Ket si' rawhide', sàs 'soft leather from reindeer legs'.

3.4.2.2. *TS-series: the non-lateral affricates *ts', *ts*

Leer (2008:2) argued that the affricate *dz* in Na-Dene arose secondarily through cluster resolution when *d* (or *də*) combined with a following consonant. Thus there are only two proto-segments in this series. Discounting instances where PAE *ts' or *ts derive from original palatal stops, the two apico-dental (or apico-alveolar) affricates *ts', *ts show the following correspondences with Yeniseic. The glottalized and aspirated occlusives in this series fell together in onset, just as in the T-series examined above, as well as in the remaining obstruent series examined below. Recall that in coda position the original distinction between glottal and non-glottal obstruent is distinguishable in Yeniseic by the tonal contrast it generated on a preceding short vowel.

[11] Jim Kari (p.c.) has suggested that Dena'ina -zex 'crumbs, small particles' represents evidence that Proto-Athabaskan had separate words for 'sand' vs. 'crumbs, small particles'.

Table 31. ***Dene-Yeniseic TS-series correspondences***

Na-Dene	Modern Yeniseic
**ts'* →	*t* (Ket/Yugh), t^h (Kott), with following /ə/ and /ɯ/ rather than /e/ and /i/ in Ket/Yugh
	PA**ts'əq* 'finger', Tlingit *tɬ'ît͡ʃG* 'finger', Ket *tə'q,* Yugh *tə'χ* 'finger' (more generally, 'finger, toe')
	PA**ts'uˑ* 'teat, milk', Ket *təɣa* 'chest, breast', Kott $t^h a$ 'breast',
**ts* →	*t* (Ket/Yugh), t^h (Kott), with following /ə/ and /ɯ/ rather than /e/ and /i/ in Ket/Yugh
	PA**tsəx* 'poke, hit using the end of an object', Tlingit *tsaG* 'hit endwise', Ket *ted ~tad ~teɣ* (<**təç*), Kott $t^h i$

There is one systematic exception to this correspondence set in Yeniseic. Apparently, the early Yeniseic sequences **tsu* and **ču* (from either plain or glottalized onset) simplified to *su.* Evidence for this comes from an interesting parallel in words meaning 'mosquito, midge'. Eyak has *ts'iyux* 'midge' (Krauss ms:717), while Proto-Athabaskan 'mosquito' shows a vacillation between **ts'uˑy*(ə) and **ts'iˑy*(ə). Modern Ket has *suˑj* 'mosquito' (< **tsuˑx*) and *tɯˑd* 'midge' (< **tsiˑx*). This suggests the two alternate roots reconstructed for Proto-Athabaskan may originally been two different, but related words for biting insects.

3.4.2.2. *K^y-series: the palatal (or front-velar) obstruents *g^y, *k'^y, *k^y, *x^y*

The Proto-Na-Dene palatal series is transcribed throughout this article using the palatalized velar symbols **g*^{y}, **k'*^{y}, **k*^{y}, **x*^{y}, following Leer's (2008) practical orthographic convention **gy*, **k'y*, **ky*, **xy*. Not only are Leer's symbols more transparent than the canonical IPA palatal obstruent symbols **ɟ*, **c'*, **c*, **ç*, they also convey the possibility that the original sounds could have been palatalized (or front) velars rather than true palatals. For simplicity's sake, the series itself will be uniformly referred to as the 'palatal series', again following Leer (2008). Note that this series should not be confused with the front velars that developed in early Athabaskan through the fronting of original plain velars.

In Proto-Yeniseic, these sounds appear to have fronted to **d*^{j} (< **dž*), **č*, and **s* only before a front vowel; in other environments (after a back vowel or in coda position) they took on a back articulation, becoming plain velar or even uvular, depending on the language in question. I will argue that a similar conditioning may have affected their reflexes in other Dene-Yeniseic languages as well, since the distribution of front vs. back reflexes of these sounds seem to differ both across the Yeniseic daughter languages as well as within Na-Dene. For example, Tlingit, like Arin and Pumpokol in Yeniseic, sometimes shows velar reflexes of this series even after front vowels. This apparent tendency of palatal series reflexes to differ in conjunction with front vs. back vowel articulation could explain the appearance of *k* rather than expected *š* in some Tlingit

cognates when chronologies of vowel changes are considered. This would follow too from Leer's (2008:14) observation that instances of Tlingit *š* from the proto-palatal *k^y often correlate with a following front vowel. The appearance of back (in fact uvular!) reflexes of these sounds in Ket/Yugh when not in an environment before a front vowel, suggests a link with the place of articulation of the following vowel.

Table 32. ***Dene-Yeniseic K^y-series (palatal-series) correspondences***

Na-Dene — Modern Yeniseic

*g^y → *d* (Ket), *d^j* (Yugh), *dž ~ dz* (Kott dialects), *t* (Pumpokol), with following /i/ and /e/ rather than /ə/ and /ɯ/ in Ket/Yugh

PND~*g^y*ind* 'one animate subject falls, undergoes an experience' (Leer08:10); Ket -*den,* Yugh -*d^{j}en* 'animate subject undergoes experience' (basic root used in numerous verbs to denote stabbing or slashing motions; not attested in the apparently original meaning of 'fall')

PND~*g^y*ux* 'poke, stab O'; Eyak -*dzux*, Tlingit -*gu* (Leer 2008:12), Ket -*do:,* Yugh -*d^{j}ou* 'poke, stab O' (basic root used in numerous verbs to denote stabbing or slashing motions)

Also interesting here are Kott words for 'mountain' recorded by various explorers: *džii ~ džij ~ dzix ~d^{j}ix ~d^{j}i ~ Ggy* (Werner 2005:310). This word was lost in northern Yeniseic, where there is no mountainous terrain. Cf. Tlingit *gu`dl* 'bump, hump', *gu`dž* 'hill', and PA **dzəɬ* 'mountain', which Leer compares to PND~*g^y*ux* 'poke, stab O' (Leer 2008:12).

Na-Dene — Modern Yeniseic

*k'^y and *k^y before original front vowel → *t* (Ket), *č* (Yugh), *š* (Kott), *k* (Arin and Pumpokol; possibly uvular *q*); in Ket/Yugh the vowels /ə/ and /ɯ/ developed from original /i/ and /e/ after the onset became **č* in proto-Ket-Yugh

PAE**tseˈ* 'stone', Tlingit *ša`* 'mountain', Ket *tə's,* Yugh *čə's,* Kott *šiš,* Arin dialects *kes ~qes*, Pumpokol *kit* 'stone'

PA**tsi'* 'head', Tlingit *šá* 'head', Ket *tɯ',* Yugh *čɯ'* head', Pumpokol *ke* (basic root appearing in numerous compounds and derivations, some morphologically cognate with complex words in Na-Dene).[12]

*k'^y and *k^y elsewhere: →*q* (Ket), *χ* (Yugh)

PND~*k^y*o:* 'undergo pangs (of pain, starvation, death)'; PA**tsa:* 'root in verbs of dying' (Leer08:16), Ket -*qo:,* Yugh -*χou* 'die' (basic root)

PND~*k^y*o:n* 'hem, hanging end of garment'; PA**tsa:n* 'breechcloth', Tlingit *kú:n* 'hem (of coat or shirt)' (Leer08:12), Ket -*qan* 'hem, hem object'

[12] Leer (2008:14) reconstructs PND head as containing a final nasal, based on the appearance of a nasal in certain combining forms: Eyak *tsiŋ'-də* 'neck' (Leer 2008:14). I suspect this nasal was a connector element rather than part of the root; the same element may show up in Yeniseic in conjunction in certain possessive constructions: Ket *bu-da-ŋ-al* 'from him' (he-3poss-ŋ-ablative).

PND~*$k^{y}ox$ 'become dry'; PA*$tsa{:}y$ 'be dry', Tlingit $ku\grave{}x^{w}$ 'go dry' (Leer08:12), Ket -qoj 'become dry', Yugh -χoj 'become dry', Kott -$šig$ 'dry', Arin koj 'dry'

PND~*$k^{y}itɬ'$ 'ashes', PA*$tsi{:}tɬ'$ 'hot coals, embers' and Tlingit $keɬ'$-t 'ashes' (Leer 2008:12), Ket qol-an 'ashes', Yugh χol-an 'ashes' (the back vowel in Yeniseic may represent the original articulation, with Tlingit /e/ fronting later, but leaving the earlier velar reflex from palatal *c'). There is also Ket $kɯl$- 'hot embers', used as an incorporated in the verb $kɯl$-to meaning 'bury object', originally confined to the meaning bury 'in hot ash or embers as a means of cooking'; the onset would be expected to be /q/, however, and not /k/.

(in coda) PND~ *$t'ik'^{y}$ 'ice' (Leer08:19-20), Eyak $t'its'$ 'ice', Tlingit $t'í{:}x'$ 'ice', Ket $ti{\cdot}k$, Yugh tik 'snow frozen on the ground' (note that the expected Ket rhyme *iq became /ik/, as it does everywhere in Ket/Yugh)

*x^{y} → s (Ket, Yugh), $š$ (Kott), t (Pumpokol), with following /e/ and /i/ rather than /ə/ and /ɯ/ in Ket/Yugh

PND ~ *$šxa{:}n$ 'old age, person; old'; PA*$x^{y}a{:}n$ 'old age', Tlingit $ša\grave{}n$ 'old age' (Leer 2008:5), Ket $si{\cdot}n$ 'old', Yugh sin 'old'

PND ~*$sxin$ in words meaning 'shaman', 'cure by singing'; PA*-$x^{y}en$ 'sing a medicine song', Eyak $xi{:}l$ 'shaman', Tlingit -$sa'n$ 'cure O shamanisticaly' (Leer08:4), Ket/Yugh sen-$iŋ$ 'shaman', Kott $šen$-$aŋ$ 'shaman', sen-da $dɯ'$ 'shaman's cap' (sen-da shaman-3possessive + $dɯ'$ 'hat, cap'); the syllable -$iŋ$ probably derives from $iŋ$ 'person'.

It is my hope that Yeniseic comparanda will help sort out some of the idiosyncrasies in Tlingit vs. AE proto-palatal correspondences by suggesting how front vs. back vowel articulation may have affected the evolution of this series in Tlingit. The whole picture likely involved different chronologies of palatalization. An apt typological parallel might be the sequential stages of velar palatalization in Slavic.

3.4.2.3. *K^{w}-series: the rounded velars *g^{w}, *k'^{w}, *k^{w}, *x^{w}*

Krauss (1964) demonstrated that this series retained velar articulation in Tlingit and Eyak, but became retroflex in much of Athabaksan. This series has exactly the same reflexes as the series reconstructed as postalveolar ($dž$, $č'$, $č$, $š$) for Proto-Athabaskan-Eyak. There is some evidence that the latter series in Na-Dene most likely represents an earlier palatalization of the same K^{w} series inherited from Proto-Na-Dene before front vowels. Compare the forms Proto-Athabaskan-Eyak *$džeq'$ 'pitch' and Tlingit -$čeχ'$ 'become dirty' alongside Eyak*-$gəχts'$ 'be sticky', Eyak $gahG$ 'pitch' and Tlingit -$k'u'χ'$ 'pitch, gum' (Leer 1993:88).[13] These forms suggest the original onset in all these words

[13] I am very grateful to Jeff Leer for allowing me to Xerox and make use of his unpublished typewritten manuscript *AET Comparative Lexical Database*, dated Aug. 30, 1993.

was *k^w, which originally palatalized before front vowels but not before back. In later Proto-Athabaskan (but not in Eyak and Tlingit) all the remaining (i.e., still unpalatalized) rounded velars palatalized to yield somewhat different sounds (as shown in Krauss 1964 and elsewhere). Taking this approach to the origin of post-alveolar affricates in early Na-Dene might lead to the discovery of more Tlingit/AE cognates. It will also remove the need to distinguish between a rounded velar series and a post-alveolar series, since both sets of sounds apparently came from the same series in Proto-Na-Dene.

Additional evidence for this proposal comes from Yeniseic. Note the interesting doublets in Yeniseic where /k/ precedes a back vowel but /*d* ~ *d^j* ~ *č*/ precedes a front vowel in what appear to be the same root etymologically. One example is Ket/Yugh *kə'n*, Kott *kan* 'light' (adjective) vs. Ket *di·n*, Yugh *d^ji·n*, Kott *čin* 'daylight, light of day' (noun). In the noun, some sort of derivational process seems to have yielded high-tone full vowel /i/, which in turn triggered palatalization of the onset. The same pattern is observable in Yeniseic words for 'rump, thigh, base or trunk of tree', which reveals an identical display of variation between k-sounds + back vowel and d-sounds + front vowel: Ket/Yugh *ko'd* 'rump' vs. Ket *di'* 'thigh, base of tree', Yugh *d^ji'* 'thigh, base of tree', Kott *či* 'thigh, base of tree'.

While this would appear to be simply a Yeniseic-internal phenomenon, both pairs in question, including perhaps the very derivational processes that link them, show exact parallels in Na-Dene, with the onsets remaining velars before a back vowel (until early Athabaskan, where all of the onsets in question palatalized). The Ket irregular plural *datn* 'thighs' suggests it is cognate to PA *g^wa·də* 'lower leg, shin', while the Eyak *g^wədə*, 'rump' appears cognate with the original Ket noun *ko'd* 'buttocks'. Only later did PA *g^we.n* 'light of day' and *g^wa·də* 'lower leg, shin' undergo a new palatalization rule, which turned all of the remaining labialized velars into retroflex (or post-alveolar) consonants: *d^re.n* 'light of day' and *d^ra.də* 'lower leg, shin'. In Tlingit, like Eyak, the original velar also remained before aback vowel; cf. Tlingit *-gan* 'burn, shine', *ga·n* 'outside' (Leer, 1993:38). Words like Eyak *ge·-* (in a construction meaning 'noon') and PA *g^we·n* 'light of day' presumably acquired their front-vowel articulation after the original Na-Dene palatalization rule had stopped applying.

Therefore, despite the differing onsets in PA*džeʻq' 'pitch' (an inheritance of the original palatalization before front vowels in early Na-Dene) and PA *d^re·n or *$dž^w$e·n 'light of day' (the result of a new palatalization occurring only in early Athabaskan but which applied everywhere, or nearly so), these sounds ultimately derive from the same series. This would explain why reflexes of this series in Yeniseic are uniform: Ket *di·k*, Yugh *d^jik* and Kott *čik* 'pitch'; as well as Ket *di'*, Yugh *d^ji'*, and Kott *či* 'thigh, base of tree'. The Yeniseic reflexes in all such cases are uniformly split according to the place of articulation of the following vowel between *d*-sounds before front vowels and *k*-sounds elsewhere, regardless of whether the cognate in question corresponds to the Athabaskan postalveolar series or to the Athabaskan rounded velar series. Once again, in the case of the development of the labialized velar series in Na-Dene, just as in the case of the palatal series, an apt typological parallel might be the sequential velar palatalizations of early Slavic.

Table 33 illustrates how the Na-Dene internal difference between *g^w and *dz is irrelevant to the Yeniseic correspondence. Note that while the picture with *g^w and *dz is clear, the varied Yeniseic correspondence to PA *k'^w / *$č'$ and k^w / *$č'$ suggest that additional possible splits may have occurred in Yeniseic (such as a change to /d/ before unrounded vowels but to /k/ before rounded). At present I cannot be sure, but the split does not seem to correlate with the difference between palato-alveolar and retroflex in Proto-Athabaskan. Finally, lacking an Athabaskan cognate, I am not sure where to place the onset correspondence between Ket/Yugh *tɯˑɬ* 'navel' vs. Eyak *džitɬ'* 'navel' and Tliingit *ku`l* 'navel' (Leer 1993:82)

Table 33. ***Dene-Yeniseic K^w-series correspondences***

Na-Dene	Modern Yeniseic
*g^w / *$dž$ before front vowel in early Yeniseic → *d* (Ket), d^j (Yugh), *č* (Kott), with following /i/ and /e/ rather than /ə/ and /ɯ/ in Ket/Yugh	
	PAE* *džeˑq'* 'pitch', Eyak *gahG* 'pitch'; Ket *diˑk*, Yugh d^jik, Kott *čik* 'pitch'
	PA *g^waˑdə* 'lower leg, shin'; Ket *di'* 'thigh, base of tree' (plural *da'n*), Yugh d^ji' 'thigh, base of tree' (plural d^jatn ~*da'n*), Kott *či* 'thigh, base of tree'
	PA *g^we.n* 'light of day'; Ket *diˑn*, Yugh d^jiˑ*n*, Kott *čin* 'daylight, light of day'
*g^w elsewhere → *k* (Ket, Yugh, Kott), with following /ə/ and /ɯ/ rather than /i/ and /e/ in Ket/Yugh. Note that this correspondence yields the only instance where Kott /k/ corresponds to Ket/Yugh /k/; in other cases, Ket/Yugh /k/ corresponds to Kott /h/	
	Eyak g^w*ədə*, 'rump'; Ket/Yugh *ko'd* 'rump'
	PA *g^weˑn* 'light of day' (noun) is also partly cognate to the Ket/Yugh *kə'n* and Kott *kan* 'light' (adjective)

Na-Dene	Modern Yeniseic
*k'^w / *$č'$ and k^w / *$č'$ before front vowels in early Yeniseic → ??? *t* (Ket/Yugh), t^h (Kott), with following /ə/ and /ɯ/ rather than /e/ and /i/ in Ket/Yugh	
	PA*$č'^wi$ˑ*x* 'canoe'; Ket/Yugh *tij* 'canoe'. Note that the original vowel in Ket/Yugh must have been *ɯ*, which fronted to /i/ between /t/ and /j/.
*k'^w / *$č'$ and k^w / *$č$ in other cases → *d* (Ket), *d* (Yugh), *t* (Kott), Arin t^j, with following /ə/ and /ɯ/ rather than /e/ and /i/ in Ket/Yugh since this sound was apparently *č at some stage in early Yeniseic.	
	PA*$č'$*ətɬ'* 'bushy, shrub, plant' (perhaps specifically 'willow', as well); Ket *dɯˑl* 'willow'; Yugh *dɯˑl* 'willow'; Kott *tili* 'willow' (The excrescent vowel in Kott occurs in other instances of original coda *$tɬ'$ and may have arisen as a means of coda cluster resolutions, later followed by the elision of the segment /t/).

PA*č'əχd 'hat'; Ket dɯ', Yugh dɯ', Kott ti, Arin $t^{j}ej$ 'cap', $t^{j}ugn$ 'caps'
But note the cognates for 'wolverine', where Yeniseic shows /k/: Eyak *kena's 'wolverine' (Krauss ms:759) and PA *-čĭ·s in word for 'wolverine' (Krauss & Leer 1981:194); Ket kùn, Yugh $kùː^{h}n$ 'wolverine'

Na-Dene Modern Yeniseic

*x^{w} → *s* (Ket/Yugh), *š* (Kott), x (Arin/Pumpokol) (but original **xi* in Ket/Yugh became /i/; with following /ə/ and /ɯ/ rather than /e/ and /i/ in Ket/Yugh

PA*$š^{w}a·$ 'sun', Eyak $x^{w}ah$ 'summer'; Ket/Yugh sɯː (< *$x^{w}a·$-ha 'sun + 'repeated in sequence'); Ket/Yugh i· 'sun'; Ket/Yugh i·ɣan 'sunlight'; Kott e-ga 'sunlight'; Arin xa-gali 'sunlight'; Pumpokol hi-χem 'sunray' (χem = arrow', cognate to Ket qa·m 'arrow')

PA*$š^{w}$əñ 'black'; Ket/Yugh sə'n 'dark blue or green'; Kott suenga 'blue, gray'

PA*$š^{w}$əq' 'back, hook-shaped'; Ket su·k 'back'; Ket su·- 'middle'

PA*$š^{w}$əq'ɬ 'hook'; Ket sùɬ and Yugh $sùː^{h}ɬ$- 'hook'

Note that initial *čɯ (like *tsu) became /su/ in Ket/Yugh. This accounts for the onset correspondence between Ket su·k 'ochre, color, paint' and PA či·x 'ochre' (Krauss 20005:84). Arin shows š from *č in such words, rather than the /s/ that normally corresponds to Ket/Yugh /s/. Cf. Arin šujgen 'alder tree' (<šuj 'ochre' + gen 'tree'). It is also possible that PA *šu·q' 'robin' (Krauss 20005:84) could have an etymological connection with Na-Dene terms for 'ochre' (due to its distinctive ochre-colored breast). In Ket, the original uvular coda (lost in auslaut before high-vowel /u/ reappears in the compound suʁaq 'rust' (< *tsu·q 'ochre' + aq 'rot')

3.4.2.4. *K-series: the unrounded velars *g, *k', *k, *x*

The regular velars (unrounded non-glottalized as well as glottalized) also assimilated to a following front vowel in Yeniseic, remaining unchanged elsewhere (except where coda reduction rules apply). Also, everywhere except in Arin, original velars dropped before any high vowel. This accounts for Yeniseic-internal correspondences such as Ket/Yugh u·s 'thaw', but Arin kus 'thaw' (??note: I bet there is some Athabaskan root ~hus or kus 'thaw' - but not in my materials); or Ket ɯ·n 'two', but Arin kin 'two'. Additionally, Ket/Yugh but not Kott or Arin, the aspirated *k* must have spirantized and then disappeared, yielding correspondences such as Ket ən ~ ə'n 'pole, stick, tree' but Kott/Arin -gen 'tree, pole' (cognate with PA *kən 'pole, stick, tree'): Kott šujgen 'alder' (= 'ochre wood'), Ket sujiŋ 'alder', Arin šujgen 'alder' and ittigen 'fir tree' (? + tree). Also note Ket ʌŋn 'main tent pole' and Kott ha-gin-i 'straight pole'). In monosyllables the elided *k must have become a continuant (probably velar approximant ɯ) which yielded instance of falling tone alternating in free variation with glottal tone for some reason: Ket ən ~ ə'n 'stick'. Another examples of this is Ket ɯ̀n ~ ɯ'n 'base, sled-runner', which unfortunately lacks any documented cognates in Kott or Arin. However, it

is clearly cognate with PA *ka·n 'belly, base, sled-runner'; note that the raised vowel in Ket is regular in cognates with an Athabaskan original full vowel.

As things currently stand, the paucity of Yeniseic reflexes to Na-Dene *g, *k and *k' represents one of the weakest aspects of the link I am proposing. I suspect there is much more to the velar correspondences than I have presented here. Some instances of initial /h/ in Ket/Yugh may derive from original *g. Ket/Yugh *h* to Kott *h* is a common correspondence Yeniseic internally, but I lack cognates with Na-Dene for such words. I also need cognates with *k', which I suspect fell together with *k. On the other hand, there is a possibility that Na-Dene original g before a front vowel yielded Ket/Yugh /b/: cf. PAE *gag 'mother's brother', Ket *be'p* 'brother- or sister-in-law'. Final Ket /p/ that seems to correlate with an original velar changes to /v/ intervocalically: *bevaŋ* 'aunts, uncles' (< *be'p* + plural *ŋ*); while final /p/ that correlates with PA *$ŋ^w$ elides: *-do:n* (< *-dop* 'drink' + animate-class plural suffix /n/).

In Table 34, only the straightforward correspondence given for velar fricative onset *x is likely to be complete at this stage of comparison.

Table 34. ***The Dene-Yeniseic K-series correspondences***

Na-Dene	Modern Yeniseic
g before front vowels in early Yeniseic →	???possibly *h* (Ket/Yugh), in Kott: *h*, where not voiced to *g*; or possibly Ket/Yugh /b/, Kott /p/
g in other cases →	*q* (Ket), *χ* (Yugh), *h* (Kott)
PA*gəndz 'cartilage'; Ket *qòn*, Yugh *χo:^{h}n* 'cartilage'	

Na-Dene	Modern Yeniseic
k' and ***k*** →	Ø in Ket/Yugh, with falling tone sometimes alternating in free variation with abrupt tone, *h* in Kott where not voiced to *g*, with following /ə/ and /ɯ/ in Ket/Yugh
PA*kən 'stick, pole, tree'; Ket/Yugh *ən* 'stick, branch', Kott/Arin *-gen* 'tree, pole'	
PA*ka·n 'base, belly, sled-runner'; Ket/Yugh *ɯ̀n ~ ɯ'n* 'base, sled-runner'; Pumpokol *kaŋ* 'belly	
PA ~*kən(ə)s 'rosehip', Tlingit *k'inče·ɯi* 'rosehip' (Krauss & Leer 1981:117, 195); Ket *əmas* 'rosehip, rosebush', *əmɯl* 'thorn'	
Also note: PA *ka$χ^w$ 'big (Leer 1993:22); Ket *qa'* ~ *qà* 'big', Yugh *χe'* ~ *χè:^{h}* 'big', where onset *k yields a correspondence like *g	

Na-Dene	Modern Yeniseic
x →	*h* (Ket), *f* (Yugh), with following /ə/ and /ɯ/ rather than /e/ and /i/ in Ket/Yugh
PA*xəs 'pile', Yugh *si-fəs* 'pile of small fragments'	
PA *xe·n'tsʔ' 'wart' (Krauss 2005:101); Ket *hɯ·n* 'wart', *hɯtn-əŋ* 'warts' Yugh *fɯn* 'wart'	

3.4.2.5. *Q-series: the unrounded uvulars *ɢ, *q', *q, *χ*

The unrounded uvulars (non-glottalized as well as glottalized) also assimilated to a following front vowel in Yeniseic, replacing their uvular quality with a velar articulation. They remained uvulars before back vowels.

Table 35. ***Dene-Yeniseic Q-series correspondences***

Na-Dene Modern Yeniseic

*ɢ, *q' and *q before front vowels in early Yeniseic → *k* (Ket/Yugh), in Kott: *h*, where not voiced to *g* (but see discussion following this table)

PA**ɢuˑn* 'maggots'; Ket *kiˑn* 'maggot, worm'; Yugh *kin* 'maggots'

PA**qe'* 'foot'; Ket/Yugh *ki's* 'foot'

*ɢ, *q' and *q in other cases → *q* (Ket), *χ* (Yugh), $q^j \sim k$ (Arin dialects) in Kott: *h*, where not voiced to *g*

PA**q'əx* 'birch'; Ket *qɯ'j*, Yugh *χɯ'j* 'birch bark'

PA**q'aˑn* 'burn, ignite'; Ket *-qan*, Yugh *-χan* 'cook, boil', Kott *-gan* 'cook, burn'

PA**q'a'* 'edge'; Eyak *q'e'* 'mouth'; Tlingit *χ'e* 'outer part of mouth' (Leer 1993:43); Ket *qoˑ* 'outer part of mouth', *qo'n* 'lips', also Ket *qaˑt* 'edge, fringe'

PA**qaˑq'ə'* 'wound' < *qaˑq'* 'on surface' (both from Krauss 2005:128); Ket *-qaks* 'wound' (probably from **qɯˑq* 'surface' + *si* 'nominalizer' (coda *q* to *k* is regular after high vowel *ɯ*, and the vowel contrast between Ket high vowel /i ~ɯ/ and Athabaskan low full /aˑ/ occurs in a number of other cognates. The Ket root occurs as an incorporate on verbs meaning 'to get snagged on something': **qɯk-sut*.

PND ~**qaw* 'hair' (Leer 2008:14), *-ɣa'* 'hair' (Krauss05:129); Ket *qaˑ-de* 'wool, hair', Yugh *χaˑt* 'hair', Kott *he-ŋai* 'hair', Arin dialects *ke-ga-n* ~ q^j*a-ga-ŋ* 'hair' (< head-hair-plural.suffix). Also note the shared compound 'head-hair', as noted earlier: Ket *təˑŋ* 'head-hair' (< *tɯ'* 'head' + *qaˑ* 'hair' + *ŋ* 'plural'), PA **tsiː-ɣa'* 'head-hair' and Tlingit *ša-χa`w* 'head-hair' (Leer 2008:14)

Also note Ket *qàɬ* 'grandchild, niece/nephew', which may have a connection with Tlingit *kaɬ* 'brother's child (of female)' (Leer 1993:57)

As in the case of the unrounded velar series, I suspect there is much more to be discovered regarding the development of unrounded uvulars in Yeniseic. Note that the two examples of *ɢ to Ket /k/ given above occur before a half-long front vowel that probably arose secondarily from diphthong simplification. Evidence suggests that initial *ɢ may also have yielded /h/ or /b/ under certain circumstances. Recall also the correlation of the PAE tense/mood prefix **Ga-* with Ket *ɣa-* discussed at length in

section 2 above. One possible cognate pair supporting the correspondence /*ɢ : b/ is PAE *ɢaχ 'rabbit', Tlingit ɢaχ and Ket/Yugh *be's* 'rabbit'. There is an unusual correspondence between Ket *hʌŋ-n* 'pair of hands' and Yugh *bi'ŋ* 'hand'. These words may turn out to be cognate, or partly cognate, with Proto-Athabaskan *ɢaˑ-ne'* 'arm'. This idea is also supported by Kott *hen-ar* 'arm' (< *ar* 'bone') as well as by Modern Ket *ken-tul* 'top of shoulder, arm socket'. All these forms exhibit correspondences within Yeniseic that suggest that different historical changes in vowel articulation must have affected the reflexes of the original onset consonant, whatever it was. The development of unrounded uvulars in Yeniseic, just like that of unrounded velars, likely involves multiple rules intersecting non-trivially with chronologies of vowel changes (such as the loss of diphthongs), so that what I have presented here is very tentative.

Also note the possibility that uvular fricative onset *χ or *χ^w might also have yielded Ket /b/ under certain circumstances: cf. PA *χʊš^w 'thorn' (Krauss 2005:128) and Ket *bɯs-* 'stinger' in *bɯs-tet* 'to sting' (stinger-hit), as well as in *bɯs-t* 'wasp' (also Ket *bɯ's* 'penis', probably through polysemy). The original term 'penis' seems to be preserved in Pumpokol *kutte*, which could conceivably be cognate with the synonymous Eyak *guč'* (Krauss ms:725).

3.4.2.6. *Q-series: the rounded uvulars *ɢ^w, *q'^{w}, *q^w, *χ^w*

Uvular occlusives of this series seem to have retained their uvular articulation in all onset environments. It should be noted that Modern Ket /q/ is realized in onset position as [$^q\chi$]. During fieldwork whenever I tried to speak Ket with native speakers, any pronunciation of [q] without significant fricative release, was routinely misunderstood as [k]. This suggests that the Modern Ket uvular stop was originally a fricative in Proto-Ket-Yugh, as it remained in Modern Yugh.

Table 36. ***Dene-Yeniseic Q^w-series correspondences***

*ɢ^w, *q'^{w} and *q^w → *q* (Ket), *χ* (Yugh), in Kott: *h*, where not voiced to *g*

PA*ɢ^{w}eˑd 'poke'; Ket *qùd* 'poke, scratch', Ket *qɯ'* 'poker, ray', *qədeŋ* 'pokers, rays'

PA*q'^{w}us 'cloud', eyak *q'ahs* 'cloud'; Ket *qòn* 'dark, obscure', Yugh *qò:^{h}n* 'dark, obscure' (said especially about the sky)

PA*q^{w}ən' 'fire'; Ket *qòŋ* 'daytime'

Words for 'wolf' examined above might fit here, as well: Ket *qɯˑt* 'wolf', Yugh *χɯˑt* 'wolf'; Tlingit ɢuč 'wolf' (Naish & Story 1996:26) and Eyak ɢuž 'wolf' (Leer 1993:136)

3.4.2.7. *The lateral obstruents *ɬ and *tɬ'*

Lateral *ɬ* in onset disappeared before front vowels in Ket and Yugh, and possibly sporadically before back vowels, though the conditioning factor is not clear. Loss of onset *ɬ* yielded alternations of falling and abrupt glottalized tone just as did **k*.

Consequently, in Modern Ket, with almost no exceptions outside of recent Russian loans, the word-initial lateral appears only before back vowels. Phonetically, this sound was normally realized as [^{t}ɬ] by native speakers who were not bilingual in Russian (as attested in archived tape recordings from the 1960s and 70s). It should be noted that Yeniseic /ɬ/ allophonically voices in the coda of high and rising/falling tone syllables, as well as in anlaut when preceded by a possessive prefix. The voiced allophone is [r] in Yugh: cf. rising-falling tone in Ket *suul* 'snowsled', Yugh *sour* 'snowsled'; high tone in Ket *su·l* 'blood', Yugh *sur* 'blood'; but /ɬ/ after falling tone: Ket *sùl* 'hook', Yugh *su:^{h}ɬ* 'hook'.[14]

Table 37. ***Dene-Yeniseic lateral correspondences***

Na-Dene Modern Yeniseic

*ɬ before front vowels (and sporadically before a back vowel) → Ø with falling tone sometimes alternating with abrupt glottal tone in Ket/Yugh

PA*ɬen 'son-in-law'; Ket *èn* 'son-in-law' (no tonal variation)

PA *ɬa·ñ 'many'; Ket *o'n ~ òn* 'many'

*ɬ otherwise before back vowels → ɬ (Ket/Yugh), and voiced to /l/ in Ket or /r/ in Yugh in auslaut after high tone or rising/falling tone

PA*la' 'point, end, hand'; Ket *ɬa·* 'barb on the end of a fishing hook', *ɬa'ŋ* 'hand', *ɬaŋat* 'lower arm' (*a'd* = 'bone')

PA*ɬeg^{w} and Nav *ɬeezh* 'dirt' (YM92:393); Yugh *ɬʌ̀χ* 'dirt' (though not attested elsewhere in Yeniseic), where backing of original velar coda would have taken place in Yeniseic after ə.

PA*ɬu· 'ice, icicle, glacier' (Krauss & Leer 1981:193); Ket *ɬʌ́ʌ̀* 'heavy frost' (2nd vowel reflects second morpheme); also Ket *ɬəqtaq* 'ski with no felt padding on the bottom, used in spring to cross ice-encrusted snow' (< ice + *tə'q* 'step < 'digit, finger, toe').

Original onset **tɬ'* appears to be rare in Na-Dene (Leer 2008:2), suggesting that it, like **dl* and **dz*, was originally a composite of two segments. The one plausible Yeniseic cognate is Ket *tìx*, Yugh *čï:^{h}k* 'snake'; cf. PA**tɬ'əɣɛš^{w}* 'snake, leech' and Tlingit *tɬ'ik'^{w}χ* 'worm' (Leer 1993:137). This is one of the few instances where Ket /*ti*/ corresponds with Yugh /*či*/, demonstrating the original onset was something other than *č*,

[14] The obvious allophonic relationship between Ket/Yugh [*ɬ ~ l ~ r*] seems to have been persistently overlooked by the various proponents of genetic linkages between Yeniseic and other Eurasian microfamilies or isolates such as Northwest Caucasian, Northeast Caucasian, Burushaski, Basque, Sumerian, etc. This might be connected to the fact that many of the vaguely look-alike words offered as cognates crucially depended on the presence of multiple liquid phonemes (cf. Vajda 2001 for an annotated listing of these studies, though minus the sarcasm). All of these linkages, just like 'Altaic', 'Amerind', 'Khoisan', 'Nilo-Saharan', and 'Haida + Na-Dene' remain the linguistics profession's equivalent to 'urban legend'. The idea that Sino-Tibetan could be demonstrably relatable to Na-Dene (first suggested by Sapir) or to Yeniseic (first suggested over 100 years ago and explored by Moscow linguist Sergei Starostin in the 1980s and 90s) might warrant a more serious look. But any takers should be prepared to devote several years to such an undertaking.

since a postalveolar affricate would have yielded /ɯ/ instead of /i/. Interestingly, the identification of the Yeniseic onset as originally containing a /t/ and /ɬ/ sound receives possible support from the suspiciously large number of words in both families that use the form T(v)L to denote things associated with long flexible shape or action involving such objects: Ket *tuln* 'lizard', *tùl* 'small intestine', *to·l* 'wattle fence', and possibly also such words as Navajo *tɬ'oh* 'grass', PA **tɬ'u* 'weave' (Young & Morgan 1992:586). The same ancient root might even be the basis for a common Dene-Yeniseic term for 'left side', 'left-handedness': Ket *tū·l* 'left', PA **tɬ'əɣəx* 'left side' (Krauss 2005:129). A more concrete phonological process supporting the identification of the original onset of Ket *tìx*, Yugh *čï:^{h}k* 'snake' as something other than **č* comes from the fact that Ket/Yugh cognates to Athabaskan words beginning in **č* or **č^{w}* normally show the vowels /ɯ/ and /ə/ rather than /i/ and /e/.

4. *Conclusion*

The main evidence supporting a genetic relationship between Yeniseic and Na-Dene can be summarized briefly as follows. The expression of tense/mood/aspect, though extremely complex in all of the daughter languages, fundamentally involves the interaction of two pairs of cognate morphemes. The first pair is the tense/mood/aspect prefixes **x^{ʏ}(ə)-* and **ɢa-*, which are probably derived from ancient auxiliary verbs. The structural opposition between these two morphemes was probably based on expressing some contrast involving telicity (the intrinsic phasality of an action). The second opposition involves a pair of temporal/aspectual suffixes, which could be called, for simplicity sake, the L-progressive and N-perfective. The remaining verb prefixal positions or zones likewise show extensive homologies going far beyond basic typology. The ones examined here included a distinctive set of three shape prefixes placed before the tense/mood prefixes, a perfective/stative prefix between the subject slot and the verb base. Other possible homologies include possible cognates among the verb-internal pronominal elements themselves, as well as their parallel positioning in the verb complex (3rd person agreement before the tense/mood prefix, 1st and 2nd after).

Outside the verb complex, the nominal morphology contains a small but significant number of cognate compounds and derived words showing structural and semantic parallels that cannot be due to coincidence. These included the root compound 'head + fur/hair' to mean 'head-hair' and a root meaning 'hook-shaped' + the instrumental suffix *-ɬ* to denote a 'holding hook'. Only items of core vocabulary, notably body parts, natural phenomena, and basic actions appear to be cognate. Most notably, the obvious cognates include words for biota, natural history, anatomy, and skill sets that specifically reflect hunter/gatherer life in the northern subarctic taiga forests. This is exactly what one should expect if these two language groups were related over a time depth of many thousands of years.

Also, it should be pointed out that many of the most convincing cognates do not appear to be cognates until one knows the sound rules connecting them, a fact that should lend credence to the system being proposed here. Most Ket and Athabaskan words that superficially resemble one another in form and meaning are not cognates at all, but rather coincidental look-alikes of the kind easily found between any two languages. Yet because of their systematic phonetic parallels, the true cognate pairs yield a system of interlocking

sound correspondences sufficient enough to provide a basic idea of the entire sound system – even without a full prior reconstruction of Proto-Yeniseic phonology. The comparisons presented above offer a theoretical system for testing new potential cognates. Potential new cognates should presumably obey all of the rules of onset, vowel, tone, and coda correspondence, as well as appear plausible on morphological and semantic grounds in light of the emerging view of 'Dene-Yeniseic'. This is a far cry from a list of unordered look-alike words that can simply be added to or subtracted from based simply on the coincidence of resemblance, without any control from established rules that could test whether the resemblance is coincidental or part of a pattern.

Obviously, much still needs to be done to reconstruct Proto-Yeniseic and Na-Dene – let alone "Dene-Yeniseic". Correspondences involving original unrounded velar and uvular onsets, in particular, need to be sorted out with much more precision. Work on kinship terminology, fish and bird vocabulary is nearly lacking. In very many cases, a word known to me from the extensive descriptions of Navajo (Young & Morgan 1988, 1992; or Young 2000) or from Ahtna (Kari 1990) or Koyukon (2000) might appear a promising candidate as a cognate for some Ket term in basic vocabulary; however, my rudimentary knowledge of Na-Dene historical linguistics does not permit me to take the comparison further, in the absence of comparative data from Eyak or Tlingit. Further work on this project will undoubtedly require the active cooperation of specialists in Athabaska, Eyak and Tlingit, as well as Yeniseic. With the extensive good will and invaluable assistance I have been receiving from my Alaskan colleagues during preparation for the Dene-Yeniseic Symposium (Feb. 2008), I feel optimistic this mutual work can only proceed at an accelerated pace.

Also not dealt with in the present article is the issue of incorporated postpositions and object marking in the verb complex. Still, the morphological homologies, cognates and sound correspondences presented above are extensive enough for data from each family to be uniquely useful in helping understand the historical development of the other family. To stress it once more, this "usefulness" of the comparanda is what constitutes true proof of a genetic linguistic link. An unordered list of look-alike vocabulary or a few typological parallels cannot be used as the basis for concluding that languages are genetically related, although, as Lyle Campbell (1997 and elsewhere) and other historical linguists have repeatedly stated, such preliminaries might be helpful in determining where to *begin* serious comparative linguist work. A language family based on superficial comparisons of the type hitherto presented in favor of "Haida + Na-Dene" can either be simply believed in or ignored, since the alleged evidence is useless and trivial, in and of itself. Genuinely demonstrable genetic relationships between languages provide infinitely more than just a common color on a map or the hyphenated name of some "phylum" or "discoverer". For historical linguists who are interested in something beyond what color of shading to use when drawing a world language family map, the true demonstration of genetic relationship offer an invaluable vantage from which to view and better discern at least some of the concrete morphological and phonological changes that have made each member language into what it is today. External comparative evidence is a treasure trove waiting to be utilized. So far, with regard to Dene-Yeniseic I have managed to pry open the lid of that treasure chest only slightly.

Finally, it need be stated that long gone are the days when a single person can "discover" or "prove" a genetic connection between languages. Any such undertaking

represents by definition an enormous collective project of many specialists and many sources over many years. Such a result does not spring full-grown out of a single head like Athena. Perhaps the beginnings of the long story of Dene-Yeniseic detective work date back to the Cossack adventurer Arzamas Loskutov, who in 1735 due to boredome and lack of alcohol recorded the last Arin words from the last Arin speaker, unknowingly providing invaluable comparative data that attest several properties about Yeniseic that could not otherwise be known or used to compare it with Na-Dene. Or perhaps it began with the Russian peasants of the Yenisei River basin who for centuries called the local Ket people "the Siberian Indians". Or perhaps with the early explorers of America's Pacific Northwest coast who recorded the first Eyak and Tlingit words. Or with the vibrant school of Descriptive Linguistics in early 20th century America, which did so much to further the scientific study of Na-Dene languages. Or with the indefatigable Andreas Dulzon and his many students and colleagues in Tomsk, Siberia, who recorded and analyzed Ket and Yugh data for decades. The clearest lesson gleaned from comparing Yeniseic and Na-Dene is that efforts spent documenting the world's disappearing languages today could have vital consequences in the future. Who could have guessed that the ancient words Native American and Native Siberian boarding-school children were punished for speaking aloud just a few short decades ago would prove to wield a power vast enough to reunite entire continents?

Postscript

The contents of this article were presented at the Dene-Yeniseic Symposium in Fairbanks on Feb. 26-27, 2008 and at the 2008 Alaskan Athropological Society convention on Feb. 29, 2008, as "The Siberian origins of Na-Dene languages". I subsequently (March 3, 2008) changed the title to "A Siberian link with Na-Dene languages" to avoid the impression that the linguistic evidence of genetic relatedness presented here can, on its own, determine exactly how peoples as geographically distant today as the Ket and Athabaskans have come to speak related languages. I would not want to pre-judge the possible answers to questions of migration, homeland, and time depth involving the ancestral speakers of Dene-Yeniseic languages. These questions certainly cannot be answered using linguistic data alone, if they can be answered at all. I am particularly indebted to Ben Potter (archeologist, University of Alaska, Fairbanks) and Victor Golla (Athabaskan linguist, Humbold State College, Arcata, CA) for their insights into how to begin assessing the real-world implications of this newly demonstrated language link.

Literature cited

Alekseenko, E. A. 1967. *Kety: ètnograficheskie ocherki*. Leningrad: Nauka.

Campbell, Lyle. 1997. *American Indian languages: the historical linguistics of Native America*. Oxford: Oxford University Press.

Castrén, M. A. 1858. *Versuch einer jenissei-ostjakischen und kottischen Sprachlehre*. St. Petersburg.

Fortescue, Michael. 1998. *Language relations across Bering Strait*. London; New York: Cassell.

Georg, Stefan. *A descriptive grammar of Ket. Part I: introduction, phonology and morphology*. Kent, UK: Global Oriental.

Harjula, Lotta. 2004. *The Ha language of Tanzania*. Köln: Rüdiger Köppe Verlag.

Hewitt, George. 1979. *Abkhaz*. (Lingua descriptive series 2). Amsterdam: Lingua.
Kari, James. 1976. *Navajo verb prefix phonology*. New York: Garland.
Kari, James. 1979. *Athabaskan verb theme categories: Ahtna*. Fairbanks: ANLC.
Kari, James. 1989. Affix positions and zones in the Athabaskan verb complex: Ahtna and Navajo. *IJAL* 55:424-455.
Kari, James. 1990. *Ahtna Athabaskan dictionary*. Fairbanks: ANLC.
Kari, James. 1996. "A preliminary view of hydronymic districts in Northern Athaabskan prehistory. Names 44.4:253-271.
Kari, James. 2000. *Koyukon Athabaskan dictionary*. Fairbanks: ANLC.
Krauss, Michael ms. *Eyak dictionary*.
Krauss, Michael. 1964. "Proto Athapaskan-Eyak and the problem of Na-Dene". *IJAL* 30:118-131.
Krauss, Michael. 1965. "Eyak: a preliminary report". *Canadian journal of linguistics* 10.2/3:167-187.
Krauss, Michael. 1969. "On the classifiers in the Athapaskan, Eyak and Tlingit verb". Memoir 24 of *IJAL*, Supplement to 35(4).
Krauss, Michael. 2005. "Athabaskan tone". *Athabaskan prosody*, ed. Sharon Hargus & Keren Rice. Amsterdam; New York: John Benjamins. Pp. 51-136.
Krauss, Michael & Jeff Leer. 1981. *Athabaskan, Eyak, and Tlingit sonorants*. Fairbanks: ANLC.
Leer, Jeff. 1979. *Proto-Athabaskan verb stem variation: the phonology*. Fairbanks: ANLC.
Leer, Jeff. 1991. *The schetic categories of the Tlingit verb*. PhD Dissertation, University of Chicago.
Leer, Jeff. 1993. *AET Comparative Lexical Database*. Unpublished typewritten draft dated Aug. 30, 1993.
Leer, Jeff. 2000. "The negative/irrealis category in Athabaskan-Eyak-Tlingit". *The Athabaskan languages*, ed. by T. Fernald & Paul Platero. Pp. 101-138.
Leer, Jeff. 2005. "How stress shapes the stem-suffix complex". *Athabaskan prosody*, ed. Sharon Hargus & Keren Rice. Amsterdam; New York: John Benjamins. Pp. 277-318.
Leer, Jeff. 2008. "Recent advances in AET comparison". Paper prepared for the Dene-Yeniseic Symposium, Fairbanks, Feb. 26, 2008.
Li, Fang Kuei. 1956. "A type of noun formation in Athabaskan and Eyak. *IJAL* 22:44-48.
McDonough, Joyce. 2000. "On a bipartite model of the Athabaskan verb". *The Athabaskan languages*, ed. by Ted Fernald & Paul Platero. Pp. 139-166.
Melnar, Lynette. *Caddo verb morphology*. Lincoln: University of Nebraska Press.
Nichols, Johanna. 1992. *Linguistic diversity in space and time*. Chicago; London: University of Chicago Press.
Porotova, T. I. 2002. *Slovar' govornykh form ketskikh sushchestvitel'nykh (s formami mn. chisla*. [Dialectal dictionary of Ket nouns (with plural forms)]. Tomsk: Tomsk Pedagogical University.
Poser, William J. 2005. "Noun classification in Carrier". *Anthropological linguistics* 47:143-168.
Rubio, Gonzalo. 2007. "Sumerian morphology". *Morphologies of Asia and Africa,* 2 Winona Lake, IN: Eisenbrauns. Pp. 1327-1379.

Ruhlen, Merritt. 1998. "The origin of the Na-Dene". *Proceedings of the National Academy of Science*s 95: 13,994-6. Washington, DC.

Naish, Constance & Gillian Story. 1973. *Tlingit verb dictionary*. Fairbanks: ANLC.

Naish, Constance & Gillian Story. 1996. *Tlingit noun dictionary*. *2nd ed*. Sitka: Sheldon Jackson College.

Tikkanen, B. 1995. "Burushaski converbs in their areal context." *Converbs in cross-linguistic perspective*, eds. M. Haspelmath & E. König. Berlin: Mouton de Gruyter. Pp. 487-528.

Trombetti, Alfredo. 1923. *Elementi di glottologia*. Bologna: Nicola Zanichelli. (cf. pp. 486, 511)

Vajda, Edward. 2001. *Yeniseian peoples and languages: a history of their study, with an annotated bibliography and a source guide*, London: Curzon Press.

Vajda, Edward. 2002. "The Ket verb in typological perspective". *Language typology and universals (STUF)*:56.1/255-92.

Vajda, Edward. 2004. *Ket*. (Languages of the world/materials 204). Munich: Lincom Europa.

Vajda, Edward. 2006. "The origin of the Na-Dene classifiers". Talk presented at the "Na-Dene Workshop", Aug 7-9, Max Planck Institute for Evolutionary Anthropology, Leipzig.

Vajda, Edward. 2007. "Losing semantic alignment: from Proto-Yeniseic to Modern Ket". *Semantic alignment*, eds. Mark Donohoe & Sören Wichman. Oxford: Oxford University Press. Pp. 140-161.

Werner, Heinrich. 1997. *Die ketische Sprache*. Wiesbaden Harrassowitz.

Werner, Heinrich. 2005. *Die Jenissej-Sprachen des 18. Jahrhunderts*. Wiesbaden Harrassowitz.

Young, Robert W. & William Morgan, Sr. 1943. *The Navaho Language*. Phoenix: Bureau of Indian Affairs.

Young, Robert W. & William Morgan, Sr. 1988. *The Navajo language: a grammar and colloquial dictionary*. Albuquerque: U. of New Mexico Press.

Young, Robert W. & William Morgan, Sr., with Sally Midgette. 1992. *Analytical lexicon of Navajo*. Albuquerque: U. of New Mexico Press.

Young, Robert W. 2000. *The Navajo verb*. Albuquerque: U. of New Mexico Press.