Language documentation strategies for Tahltan verb words

with special attention to subject prefixes

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The importance of verb words for learners

Verbs communicate so very much in Athabaskan languages:

- •person/number in logical subject
- •logical object in transitives
- •tense/aspect: already completed (past/perfective), not completed (present/imperfective), future, etc.
- •negative/positive
- •thematic categories
- •valence categories (reflexives, reciprocals)
- •oblique objects
- •other: distributives, iteration, adverbials

Examples from the Tahltan Children's Dictionary

Eshchime ts'iyāne <u>dihchā</u>	'I love my daughter-in-law'
Demā daga <u>dadenegāk</u>	'He's praying for his mother'
<u>Desbē</u>	'I am swimming'

- **Learning a language involves learning a lot about verb words.**

Importance of verbs to Tahltan projects

Dictionary-making

There is strong interest in creating a significant dictionary to supplement the children's dictionary (Edōsdi/Judy Thompson)

Text transcription and analysis

The documentation of traditional knowledge in stories requires understanding the concepts communicated by verb words; this work would be enhanced with a repository of verb words.

Creation of learning materials

Both second language learning and language learning with small children requires more material with verb words (Language Revitalization teams)

Learning outcomes for language education

To assess language learning, concrete learning outcomes are needed; it's unclear at this time what constitutes mastery of verb words in Tahltan.

Objective and road map

Objectives

- Summarize the current understanding of verb words in Tahltan
- Create a more user-friendly analysis of verb words, with a focus on subject prefixes

Road map

- Background: sound system, prior research on verbs and the prefix template, special pronunciation rules for prefixes

- Problems with current approach: complex morpho-phonemics gets in the way

- Proposal: subject are inflections; list ways of conjugation verbs in a set of inflection classes (like some approaches to Navajo)

Background: Tahltan sounds

Consonants

lab	*int-dental*	*alveolar*	*pal-alveolar*	*velar*	*glottal*	
b		d t t’		g k k’ gw kw	’	*stops*
	dz̲ ts̲ ts̲’	dz ts ts’ dl tɬ tɬ’	j ch ch’			*affricates*
	s̲ z̲	s z	ɬ l	sh	kh khw yh gh ghw	h	*fricatives*
m w		n nh y					*sonorants*

Vowels

i	ī
e	ē
a	ā
o	ō
u	ū

Conversion to phonetic symbols

Interdentals have underlining, s = θ
Palatal-alveolars: j ch ch’ sh
Velars: kh gh
Vowel length with the macron
Some vowel sounds not apparent from spelling.

More background: Tahltan within Athabaskan

Development of the obstruents
PA **ts-tš-tšr-k* continued as *tθ-ts-ts-tš* in standard, though some other developments found. (tθ= t$\underline{s}$, tš = ch)

Phonological structures
CV(C) syllables, no onset or coda clusters, codas typically only in the stem syllable (usually word-final) or in the pre-stem syllable

Coronal harmony
Coronal affricates (not *t d* and laterals) agree in coronal place (interdental, alveolar, palatal), e.g., **e[$\underline{s}$]$\underline{z}$a$\underline{z}$e** 'my belt',
cf. **e[s]none** 'my medicine'

Tone
Low-marked tone developed from vowel constriction in Proto-Athabaskan, e.g., **khē`ɬ** 'trap' vs. **khēɬ** 'pack'

Prior research on verbs

Hardwick 1984, conjunct and classifier phonology, stem-initial alternations

- Gives morphological frames for nouns and verbs, including a 11 position template for verbal prefixes
- Documents a few important conjugation classes with verbs (s̲e- and ye- perfectives) with standard template morphology and barrage of morpho-phonemic rules
- Approximately 40 full and partial paradigms

Nater 2006, historical phonology of verb stems

- Focus is on the changes leading up to present-day Tahltan
- Many useful verb triplets illustrating many conjugation patterns and stem sets

Tahltan Nation – SFU partnership (2013 to present)

- Focus: reach a better understanding of the structure of verb words by collecting more examples and providing resources for scholars and learners
- Interim stem list of 200 verbs, with 50 paradigm pages that list as many imperfective, perfective and future forms that are known; verb base given with classifier and lexical prefixes and conjugation patterns
- Didenekeh.com (started prior to 2013), illustrations of verb words in context for teaching purposes

Hardwick's template analysis

Disjunct prefixes (1-5) + conjunct prefixes (6-11) + classifier prefixes

Obl. Obj.	PostP	Adverb	Distr.	Inc. Stem	Dir. Obj.	Subj. 2	Deriv.	Conj.	Mode	Subj. 1	Classifier
1	2	3	4	5	6	7	8	9	10	11	12
es (1.sg) en (2) me (3) ye (3.sg) hi (3.pl) dah (1.pl) dah (2.pl) hu (3.pl) ho (areal) ʔe (unspec)	k'e k'a ɣa tš'a ka na kah ga	k'e 'out/down' tɬ'an(e) 'around' tan 'back to' ti 'away' (ne-P) te 'into water' łe 'into pieces' (θe) k'a (unidirect-ional motion) ni 'across' (θe) tša 'sleep' da 'up/above' (θe) te ta 'to shore' (θe) na na…ne su 'good' ga la kiθ	da		se (1.sg) ne (2) 3.sg/Subj: ∅ /non3rd ye /3.sg he/hi /3.pl hwe (1.pl) hwe (2.pl) hu (3.pl) ʔe (unspec) ʔede (refl.) łe (recip.)	he (3.du/ pl human) ts'e (unspec)	u de ne i	ye θe ne ∅	∅ (imperf.) [+high] (perf.)	s (1.sg) n (2.sg) ∅ (3.sg) θiD (1.pl) ah (2.pl) ∅ (3.pl) (cf. 7)	h ∅ L D (refl.)

Remark

- The template analysis gives a good road map of the pre-stem positions, showing the order of morphemes and their distributions.
- Actual words of Tahltan are not the simple combination of these prefixes with a stem, however, as this analysis requires a large number of morpho-phonemic phonological rules.

Classifiers and classifier phonology

Morpho-phonology of classifiers (Hardwick 1984, Bob 1999): lexically idiosyncratic prefixes, immediate left of stem, that may trigger non-automatic alternations.

			Illustration		
Classifier	**Realization**	**Other facts**	**Breakdown**	**Word**	**Gloss**
h-	[h] in 3.sg/pl, $n_{2.sg}$ + h → [n̥]	$-es_{1.sg.pf}$ → ∅	∅ + h + k'aː	**ehk'aː**	'he's gutting fish'
∅-	unimpeded voice assimilation	$-es_{1.sg.pf}$ → ∅	de_8 + s + ∅ + seh de_8 + in + ∅ + seh	**desseh** **dinzeh**	'I'm spitting' 'You're spitting'
L	[voice], or stem-initial voicing		ka_3 + s + l + seɬ	**kaszeɬ**	'I hollered (pf)'
D	[-cont], 'D-effect' (reflexives)		s + d + çi	**esji**	'I'm singing'

- Classifiers are important here because they cause special rules to take place on the subject prefixes and stem-initial consonants, need to know their existence in order to understand the different shapes of the prefixes

Interim set of morpho-phonemic rules

Rules affecting classifier prefixes

N-H coalescence. When the 2.sg prefix /n-/ occurs right before the /h-/ classifier, they merge into a voiceless nasal [n̥].

H coda deletion. The /h-/ classifier is deleted when it occurs after the following subject markers /s-, s̲iD-, ah-/.

D-effect. When the /d-/ classifier prefix is selected by a stem, or the 1.pl subject marker /s̲iD-/ is used, the stem-initial consonant undergoes a set of changes that are consistent with inserting a [-continuant] feature (i.e., turns the consonant into a stop).

D + ɬ → dl
D + s̲ → dz̲
D + s →dz
D + ç → j
D + kh → g
D + ‘ → t’

Fricative voicing. Stem-initial fricatives in stems that select the /l-/ classifier are always voiced.

Voice assimilation. Stem-initial fricatives in stems that select the /∅-/ classifier assimilate in voicing with the preceding sound.

Rules affecting conjunct prefixes

1.sg deletion. In words with stems that select the /h-/ and /∅-/ classifier prefixes, the /-s/ subject marker is deleted in the perfective.

VV resolution. Delete the first of a sequence of two vowels, i.e., V1V2 → V2.

***e*-epenthesis**. ∅ → e /#___C

Perfective raising. Conjugation prefixes /**s**e-, ye-, ne-/ have their vowel raised in the perfective, resulting in /**s̲**i-, yi-, ni-/.

s̲e-perfective deletion. The /s̲e + i/ sequence is deleted in all 1.pl positions. It is reduced to /s̲/ in 3.sg and 3.pl when it follows other conjunct prefixes. The /s̲e + i/ sequence is deleted in 1 and 2 person positions following derivation prefixes in position 7, but not after the direct object prefixes.

Phonological processes in *-k'ā* 'gut fish'

Verb base:

Stem set: k'ā, k'ā, ...
Classifier: h-
Conjugation patterns: ∅-Imperfective, ye-perfective
Prefixes: None

		Word	*Breakdown*	*Phonological processes*
			Conj.+mode+subj.+cl+stem	
Imperf	1	**esk'ā**	∅ + ∅ + s + h + k'a:	e, h→∅
sg	2	**eṇk'ā**	∅ + ∅ + n + h + k'a:	e, n+h→[ṇ]
	3	**ehk'ā**	∅ + ∅ + ∅ + h + k'a:	e
	1	**eṣik'ā**	∅ + ∅ + ṣiD + h + k'a:	e, D+h→∅
pl	3	**hehk'ā**	he ∅ + ∅ + ∅ + h + k'a:	
Perf	1	**yihk'ā**	ye + i + s + h + k'a:	e+i→i, s-→∅ (M.D.)
sg	2	**yiṇk'ā**	ye + i + n + h + k'a:	e+i→i, n+h→ṇ
	3	**yihk'ā**	ye + i + ∅ + h + k'a:	e+i→i
	1	**ṣik'ā**	ye + i + ṣiD + h + k'a:	ye+i→∅ (M.D.), D→∅
pl	2	**yahk'ā**	ye + i + ah + h + k'a:	e+i+a→a,h+h→h

Problems with this approach

Problems for linguistic analysis

- Requires large number of idiosyntactic rules, e.g., whole morphemes deleted in special context, e.g., conjugation + mode deletes in 3.pl
- 'Regular rules' not so regular, e.g., actually very difficult to correctly characterize the epenthesis rule

Problems from the learner's point of view

- Learning to speak the language requires an understanding of abstract morphology and phonology—systems that are hard for even professional linguists to master
- Learning abstract linguistics takes away from 'time on task'

Problems from the teacher's point of view

- Learning outcomes in part removed from general speaking/reading/writing/listening
- Not always clear what learning outcomes are for abstract linguistics

Proposal: subject prefixes are inflections

Proposal

The word pieces in lots 9+10+11 are listed as wholes in look-up tables.
(Perhaps these look-up tables are paradigm rules.)

Background

Precedents in Navajo: Faltz 1998, McDonough 1990, 2000 argue for portmanteau subject markers in order to reduce the complexity of the morpho-phonemics.

Motivation

- Tense/aspect and person and number in subjects are often marked with inflections cross-linguistically
- Verb inflections often subdivide into inflection classes, as seen here (Ø-, s̲e- ye- and ne- perfectives and imperfectives)
- Inflections provide a mechanism for listing information that must be committed to rote memorization
- Today: primarily motivated by learning/teachings goals

Illustration in Navajo

- **Illustration** (Faltz 1998, 1999)

  nídiiɬhaaɬ 'You (sg) (are about to) club him/her'

  ná + ∅ + d + ii + ɬ + ghaaɬ
  der. + 3.sg +der + 2.sg.imperf + cl + $stem_{Imperf}$

- **Verb base for 'to club s.o/s.t.'**

  Stem-set: ghaaɬ, ghaal, ghal, ghaɬ, ghaaɬ
  Classifier: ɬ
  Stem-aspect: momentaneous
  Root: GHAAL
  Conjugation patterns: long vowel-Imperf, y-Perf, regular, long-vowel-Imperf, long-vowel-Imperf
  Prefixes: ná-, d-

- Look up tables for long vowel imperfective conjugation

	not before disjunct prefix		*before disjunct prefix*	
	sg	dual.pl	sg	dual.pl
1	iish	iid	ish	iid
2	ii	ooh	i	ooh
3	ii		i (but yii after da)	

Comparing template and inflection approaches

Template	**Inflections**	**Word**	*gut fish*
ye + i + s + h + k'a:	yih-k'a:	yihk'a:	1.sg.perf
ye + i + n + h + k'a:	yi̩n-k'a:	yi̩nk'a:	2.sg.perf
ye + i + ∅ + h + k'a:	yiɦ-k'a:	yiɦk'a:	3.sg.perf
ye + i + s̲iD + h + k'a:	s̲i-k'a:	s̲ik'a:	1.pl.perf
ye + i + ah + h + k'a:	yah-k'a:	yahk'a:	2.sg.perf
special phonological actions			

Advantages of the inflection approach

- Makes the learning of verb words more concrete and gives clear objectives for teachers: teaching different inflection classes and how to look up the inflections in a set of tables. (Though there will be some phonological rules.)
- More 'time on task'.

Questions

- Is it possible to devise straightfoward paradigm rules for all inflection classes across modes? Might have to have more than one rule, e.g., distinguishing post-disjunct contexts and classifier rules (as does Faltz 1998)
- What linguistic evidence might there be for inflections? (Not today.)

Illustration of s̱e-perfectives

Simple cases: inflection + stem

	h+tsan	**Ø+'unh**	**d+da/ke**
1	sihtsan	s̱i'unh	sesda
2 sg	sinhtsan	s̱in'unh	s̱inda
3			s̱eda
1	sitsan	s̱it'unh	s̱ike
2 pl	sahtsan	s̱ah'unh	s̱ahke
	'smell'	*'see Obj.'*	*'sit down'*

Allomorphs of inflections

sih ~ s̱i ~ ses
sinh ~ s̱in
s̱e
si ~ s̱i
sah ~ s̱ah

Disjunct prefix + inflection + stem

	Ø+'ots̱	**l+'a'**	**d+ts̱an**
1	'eghataṣe'ots̱	tɬ'anses'a'	taṣeṣts̱an
2 sg	'eghataṣin'ots̱	tɬ'anṣin'a'	taṣints̱an
3	'eghataṣe'ots̱	tɬ'anṣe'a'	taṣets̱an
1	'eghataṣi'ots̱	tɬ'anṣi'a'	taṣets̱an
2 pl	'eghataṣah'ots̱	tɬ'anṣah'a'	taṣahts̱an
	'wash Obj.'	*'turn around'*	*'die'*

ses ~ s̱e ~ s̱es̱
s̱in
s̱e
s̱i ~ s̱e
s̱ah

Observation. Looked at14 s̱e-perfectives, it seems that the allomorphy can be characterized with the regular rule of coronal harmony and the classifier phonology

s̲e-perfective inflections with derivational prefixes

***de* (8) + inflection + stem**

	d+t'as̲ *	**d+dan**	**d+t'unh**
1	'ededes̲t'as̲	desdan	'edest'unh
2 sg	'ededint'as̲	dindan	'ededint'unh
3	'ededes̲t'as̲	yedes̲dan	'ededes̲t'unh
1	'ededes̲it'as̲	des̲idan	'ededes̲t'unh
2 pl	'ededaht'as̲	dahdan	'ededaht'unh
	'cut (refl)'	*'drink Obj.'*	*'shoot (refl)'*

Allomorphs (de/ne + infl.)

des̲ ~ des
din
des̲ (main marker)
des̲i ~ des̲
dah

***ne* (8) + inflection + stem**

	Ø+ban	**d+tin**	**d+dan**
1	unegan	chanestin	'enesdan
2 sg	uninban	chanintin	'enindan
3	yunes̲ban	chanes̲tin	'enes̲dan
1	unes̲iban	chanes̲itin	'enes̲idan
2 pl	unahban	chanahtin	'enahdan
	'pick berries'	*'lie down'*	*'shoot (refl) '*

ne ~ nes
nin
nes̲ (main marker)
nes̲i
nah

Observations

- Subject prefixes sometimes fused with derivational prefixes that have thematic content, e.g., *de-* (8) sometimes associated with 'mouth, oral' meaning
- *s̲* is replaced by *d* and *n* in most cells, but retained in 3per sg
- * *-t'as̲* is pronounced [-t'ʌθ]

Paradigm rules for s̲e-perfective inflections

		Regular pattern*	*Z=stem*	
1		s̲esZ	s̲ehZ	s̲eZ
2	sg	s̲inZ	s̲inhZ	s̲inZ
3		s̲eZ	s̲ehZ	s̲eZ
1		s̲iDZ	s̲iDZ	s̲iDZ
2	pl	s̲ahZ	s̲ahZ	s̲ahZ
		before d-/l- classifiers	*before h-*	*before Ø-*

*1.sg 3.pl i ~ e *also subject to coronal harmony*

	de8 + inflection		ne8 + inflection	
1		desZ	1	nesZ
2	sg	dinZ	2 sg	ninZ
3		des̲Z	3	nes̲Z
1		des̲iDZ	1	nes̲iDZ
2	pl	dahZ	2 pl	nahZ

- To help remember the phonology of the classifier prefixes, subject inflections can be sorted by classifier prefix.
- Also, verbs with derivational prefixes have related structure, but contain a different initial consonant; look-up tables both show why these are s̲-perfectives and how they are conjugated

Benefits: putting paradigm rules to use

Verb base with simple inflection

Gloss: ‘to die’
Stems: t͡saɬ$_{Imperf}$, t͡san$_{Perf}$
Classifier: d-
Conjugation: Ø-Imperf, s̲e-Perf
Prefixes: ta- (disjunct, 3)

Building paradigms

1.sg perfective, ‘I have died’ =

disj. + subj-1.sg.perf + stem$_{Perf}$
ta + s̲es + t͡san = *ta s̲e s̲t͡s̲an*

Verb base with derivational prefix

Gloss: ‘to drink Obj.’
Stem: dan$_{Perf}$
Classifier: d-
Conjugation: s̲e-Perf
Prefixes: de- (derivational, 8)

Building paradigms

1.pl perfective, ‘We have drank’ =

deriv. + subj-1.pl.perf + stemPerf
de s̲i + dan = *de s̲idan*

Learning

- Involves recognizing different modes (perfective, imperfective), classifiers, presence of other prefixes (derivational, disjunct), and then looking up information about the verb and the subject inflection.
- Still much to learn, but avoids the abstraction caused by morpho-phonemics so more concrete.

Look up tables for ye-perfectives

Results. Examined 13 verbs that with ye-perfectives, similar look-up tables possible, but need to distinguish simple inflections from those that come after disjunct prefixes.

Regular pattern

1		yisZ	X'isZ	yihZ	yiZ
2	sg	yinZ	X'inZ	yinhZ	yinZ
3		yiZ	X'iZ	yihZ	yiZ
1		s̲iDZ	X'as̲iDZ	s̲iDZ	s̲iDZ
2	pl	yahZ	X'ahZ	yahZ	yahZ
		Ø____	disj.____		
		before *d-/l-* classifiers		*h-* class.	Ø-class.

		de8 + inflection	ne8 + inflection
1		disZ	nisZ
2	sg	dinZ	ninZ
3		diZ	niZ
1		des̲iDZ	nes̲iZ
2	pl	dahZ	nahZ

Look up tables for Ø-imperfectives

Results. Examined 17 verbs that with Ø-imperfectives, with new tables. Still there's a need to distinction distribution classes, differences with other conjugation classes clear. Epenthesis is viable here, but not as a general solution.

Regular pattern

1		esZ	CVsZ	esZ	esZ
2	sg	enZ	CVnZ	enhZ	enZ
3		eZ	CVZ	eZ	eZ
1		(e)s̲iDZ	CVs̲iDZ	(e)s̲iDZ	(e)s̲iDZ
2	pl	ahZ	CahZ	ahZ	ahZ
		Ø____	disj.____		
		before *d-/l-* classifiers		*h-* class.	Ø-class.

		de8 + inflection	ne8 + inflection
1		desZ	nesZ
2	sg	dinZ	ninZ
3		deZ	neZ
1		des̲iDZ	nes̲iZ
2	pl	dahZ	nahZ

Some problems (sample)

	Regular s̲e-perfective		**h+tsan**
1		s̲esZ	*__sih__tsan
2	sg	s̲inZ	sinhtsan
3		s̲eZ	
1		s̲iDZ	sitsan
2	pl	s̲ahZ	sahtsan
	before d-/l- classifiers		*'smell Obj.'*

	Regular ye-perfective		**d+tsē**	**d+jin**	**d+'in**
1		yisZ	yistsē	*__yesh__jin	*'ede__des__t'in
2	sg	yinZ	yintsē	yinjin	'ededint'in
3		yiZ	***ye**tsē	*__ye__jin	*'ede__da__t'in
1		s̲iDZ	sitsē	sijin	'ededes̲it'in
2	pl	yahZ	yahtsē	sahjin	'ededaht'in
	before *d-/l-* classifiers		*'cry'*	*'sing'*	*'see (refl)'*

A worry about 'picking apart the language'

A concern I've heard

- When you pick apart a word and find these patterns, one needs to keep in mind that they might not work with every verb word.

Related problems in dictionary making for Athabaskan languages (Hargus 2007)

- Discontinuity: using word pieces to represent a verb word is not the same as using a pronounceable word
- Headwords: if using pronounceable word to represent a paradigm of verbs, which one do you pick?

Present solutions

- To some extent, recognizing inflections addresses the discontinuity problem because inflection + stem is closer to a pronounceable word than other analyses
- But need to list exceptional paradigms; no substitute to just listing full range of paradigms. 6 (subjects) * 4 (modes) * 6 (objects) = 144 verb words, but many languages have books listing paradigms, e.g., *501 verbs of French.*
- Collection may be tedious, but likely to be informative.

Snapshot from *101 Verbs of Tahltan*

EAT (-tθetθ Ø-Impf, tθe:t Ø-Pf)

		Imperfective	Perfective	Future
	1	eθtθetθ	eθtθe:t	de:θtθeɬ
SG	2	entθetθ	entθe:t	
	3	etθetθ	ahtθe:t	
	1	eθitθetθ	eθitθe:t	
PL	2	ahtθetθ	ahtθe:t	
	3	ehetθetθ	ehahtθe:t	

Sources: JDA fieldnotes, Hardwick 62, 69*, Nater 55-56, 70

Stem set:	tθetθ, tθe:t, tθeɬ
Classifier prefix:	d-
Conjugation pattern:	Ø-Impf, Ø-Pf, xxx
Lexical prefixes:	None

Notes:

- Consistent with his transcription practice, Nater's 1.sg forms all start with a *ʔ*; presumably because he assumes Tahltan does not have onsetless syllables.

Potential linguistic evidence for paradigm rules

Primary motivation: provide learning resources that make the job of learning conjugating verbs easier.

Possible linguistic evidence

- Syncretism: similarity between cells across inflection classes; so-called rules of referral difficult to express without paradigm rules (e.g. 1.pl=3.pl in German verbs)

- Inheritance hierarchies: generalizations within clusters of paradigm rules (e.g., masc. vs fem. inflection classes in Green nouns)

- Morphological change: perhaps changes in subject prefixes, or variation across dialects indicative of change, can be analyzed as morphological in the sense that the new forms confirm with other paradigm rules

For future research

More full paradigms: only have approx. 50 verb bases supported by full paradigms; need many more for language program designed to teach speaking and listening. Only a handful of paradigms with ne-imperfectives or perfectives.

Future and optatives: very few full paradigms with verbs in future or optatives; need to see what they contribute to the notion of stem sets and conjugation

Objects: though object inflection is reported to be regular, not often explored.

Classificatory verbs: is there evidence for classification of the shape and nature of objects (e.g., multiple verbs for 'give'); (answer: yes) what are these classes?

Other topics: The 'lexical items' of verbs (adverbs, postpositions, etc.), oblique arguments, distributives, iteratives, stem incorporation.

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