Determining morphological relations: the Navajo verbal complex -1

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...geographical speciation makes a tidy picture. It has a core of truth, but real evolution is messier.

...so messy that a faithful description of real cases converts the science into natural history, in which the unique details are as important as the principles by which they are explained.

E O Wilson, *The Diversity of Life*.

The big goal: describe the details of the morphology of the
 Athabaskan languages via a
   working model of the verbal complex
   organization of the lexicon of speakers.

- Composition of the verbal complex
  - *units of (re)combination*

- Organization of the lexicon
  - Examine relations between words in dense neighborhoods
  - Where meaning resides?

- Framework: *Word and Pattern* morphology

1. Why Athabaskan?

2. Why *Word and Pattern* framework?

Why Athabaskan?

Represent a classic example of 'polysynthesis'
    def. resistant to 'morpheme' analysis

        by convention uses flat, extensive 'position-class
            template' invented for comparative analyses
        reassembly governed by post-hoc rewrite rules

        Lexicon
            dense neighborhoods of 'similar' words
            closed class includes nouns and stems

Why Athabaskan?

the Athabaskan languages are closely related
    with strikingly similar morphology
    also highly complex
    spread out over a large section of North America

resistant to change, very stable
    small communities

do not borrow, no loans words

Navajo is the best documented, largest population

2 Why Word and Pattern framework?

Words (not morphemes) are fundamental objects of analysis, even in highly complex verbal systems.

This approach is "**paradigmatic**, because it identifies (sets of) patterns that whole words participate in, and **configurative**, because, while the meaning of a word form is not necessarily construed as a straightforward composition of individually meaningful parts, the meaning of the whole is associated with **reliable arrangements of its constitutive elements**."

Ackerman and Malouf 2013

reliable arrangements of its constitutive elements.

"complex surface word forms [represent] types of configurations of elements …
whole surface word forms as elements in a network of related word forms.
As observed by Matthews (1991:204): '*words are not merely wholes made up of parts, but are themselves construable as parts with respect to systems of forms in which they participate*'"

Ackerman and Malouf 2013

Word & Pattern Morphology

- Words are the basic units in the lexicon
- Inflected words are organized into paradigms
- Lexemes enter into paradigmatic relationships with each other.

Inflectional Paradigms *(InflP*)
    set of inflected variants of a word
    formed through a regular sets of alternations.

InflP a fundamental building block of the lexicon
    fundamental to the organization of the lexicon in
polysynthetic languages

cf Halle & Marantz, 1993; Lieber, 1992

Athabaskan words
reside in
very dense neighborhoods of related forms

forms may different in small phonetic details
details link forms to each other
identify constituents in the verbal complex

Closed lexicons

1 **The Navajo lexicon**
   Verbal morphology and the Navajo problem

2 **Navajo verbal complex**:
   Phonetic and phonological patterns

3 **Working model**: The (re)combinatorial elements and
        the organization of words

4   **The Closed Lexicon**

1 The Navajo lexicon

- Athabaskan languages and people

- 'Polysynthesis' and morphological complexity in NA

- Word models
  - Definitions of terms
  - IA/P 'templates'
  - Word and Pattern models

- The Navajo problem

the People

the People

Athabaskan or Dene (the People) are traditional hunter/gathers
homeland in northwestern NA.
time depth of at least 2-3 millennium

Dene communities spread across boreal forests (tiaga)
an inaccessible and inhospitable landscape

Communities remote but viable
with historically very small populations.

Dene-Yenesian connection

"tremendous wedge in the older distribution" in NA.
Sapir

Ket & Dene–Yenesian hypothesis

Edward J. Vajda, (2010) "Siberian Link with Na-Dene Languages". *The Dene–Yeniseian Connection*, ed. by J. Kari and B. Potter, 33-99. *Anthropological Papers of the University of Alaska*, vol. 5. Fairbanks: University of Alaska Fairbanks, Department of Anthropology.

"the first demonstration of a genealogical link between Old World and New World language families that meets the standards of traditional comparative-historical linguistics"

Jared Diamond (2011) Linguistics: Deep relationships between languages. Nature 476, 291–292
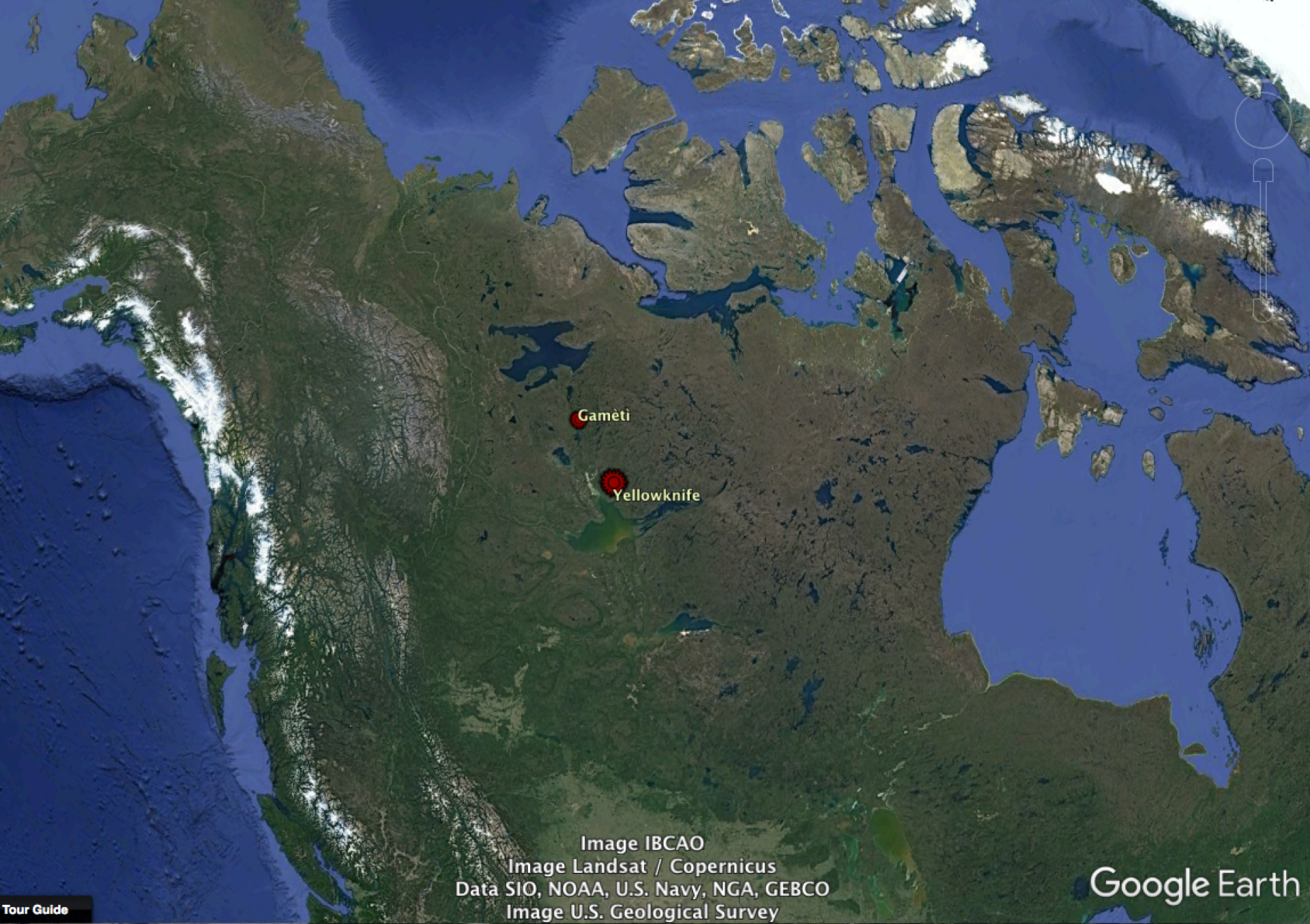
Gamèti

Yellowknife

Tour Guide

http://bit.ly/2oNzTRK

APRIL 8, 2017 | BEHCHOKÒ, WHATÌ, GAMÈTÌ, WEKWEÈTÌ | LANDS

TŁĮCHǪ WINTER ROADS CLOSED

Please be advised the Tłįchǫ Winter Road System is now **Closed for the Season** due to overflow and flooding on Marian Lake.

Thanks to our contractors and maintenance crews who did a great job again this year.

Michael Conway

Regional Superintendent

the Athabaskan people in the US

Pacific Coastal (mostly not spoken)
    Hupa, Kato

Apachean - Arizona and New Mexico
    Apache languages
        Jicarilla, Chiracahua, White Mountain
    Navajo

Naabeehó Bináhásdzo
'Navajo Nations'

the language family

Athabaskan (Dene) language family

Closely related group of languages
    strikingly similar morphology and phonetic structure

Morphologically complex, 'polysynthetic'
    w unusual properties

Primarily verbal, noun poor
    nouns and verb stems are closed class
        'bricolage' verbal complex formation

Stable over considerable time depth,
    equally resistant to change

Edward Sapir (1884 - 1939)

"The languages of the Athabaskan group are singularly conservative in form as well as in phonetics and vocabulary in spite of their enormous and irregular spread."

"They are singularly resistant to exotic influence"

The Athabaskan (Dene) language family

5 groups

non tone:

Alaska, Yukon, Pacific Northwest

tone:

interior (Mackenzie River Basin across to Hudson Bay)

Apachean (American Southwest - Navajo and Apache)

The Navajo Language:
A Grammar and Colloquial Dictionary

Robert Young and William Morgan
1942, 1980, **1987**, 1992   -60 years of work

World-class grammar and dictionary
extensive paradigm charts
organization of a complex aspectual system
dictionary of fully inflected whole word forms

The mental lexicon of a polysynthetic language

polysynthesis in NA

'Polysynthesis'
    complex and rich verbal morphology
        tense, aspect, subaspect, agreement, incorporation
         implicates structural complexity

    indicates a system
        not easily separable into morphemes
        no easy correspondence form and meaning

    contrast 'aggluntinative'
        more easily separable morphemes

'Polysynthesis' in NA
    over 300 distinct languages
    up to 30 different language families

'no true analytic languages north of Rio Grande'
                               Mithun 2000

kaipiallrilliniuk

kaig-piar-llru-llini-u-k

be.hungry-really-PAST-apparently-Indicative-they.two

'the two of them were apparently really hungry"

Mohawk

wa'tionkwatonhontsahriten'
wa'-t'ionkw-at-onhonts-hri-ht-en-'

factual-change.of.state-they/me-(my)own.earth-broken-cause-for-perfective

'they caused my earth to be broken up for me' = they plowed my garden

Mithun 2000

Mohawk (Iroquoian)

Otsì:tsa'   wakhnekahní:non
o-tsiʔtsy-aʔ   waʔ-k-hnek-a-hninų-ʔ
NEUTER-flower/wine-NOUN.SUFFIX   FACTUAL-2SG.AGENT-liquid-EPENTHETIC-buy-PRF
'I (liquid-) bought some wine.'

Mithun, 112

Tewanine'kara'wánion's
te-w-anine'kara'wa-nion'-s
DUALIC-NEUTER.AGENT-lightning.strike-DISTRIBUTIVE-IMPRF
'Lightning was striking all over.'

Mithun, 89

Wa'enontarónnion'
wa'-e-nontar-a-r-onnion'
FACTUAL-FEMININE.AGENT-soup-DUALIC-EPENTHETIC-put.in-DISTRIBUTIVE
'She kept serving the soup (one ladleful at a time to each diner).'

Mithun, 90

Oneida (Iroquoian)

wahiyateʔslehtaníhahséʔ
'I borrowed a car from him.'
Mithun 871

kateʔwahlutákwas
'I'm taking meat out of the oven.'
Mithun 876

knitstakwalanawʌthaʔ
'I'm soaking dirty clothes.'
Mithun 593

Navajo　　*Young and Morgan 1987*

náhidiishmááz
ná-hi-di-i-ø-sh-ø-mááz
around-seriative-inceptive-transitional-imp-Subj-cl-Stem

'I rolled it over'

North Slavey (K Rice 1987)

gódákǫʔededadhé
'the door opened again'
                    Rice, 733

k'ínayįht'uh
's/he swung his/her arms around, pushed things around'
                    Rice, 894

dádéhsha	nį	beghárayuhdá	góʔǫ
3.is.how.tall	COMP	1sg.opt.see.3.again	FUT

'I will see how tall she is'
                    Rice, 1186

Jicarilla Apache   (Phone et al, 1999)

hnkeenádaazéí
'the camps began to move'
                        363

ndáidnzhainá
'he picked it up'
                        570

dásidńts'ee'éná
'that you hear me well'
                        214

Hupa

je'wiłqiwh
'he pulled it apart where it was forked'
                        5; under 'apart'

nina'siwe:nik
'he has put his arm around you'
                        5; under 'arm around, put'

chwing-me'do:wehsle'
'he got hungry'
                        47; under 'hungry'

Carrier (Babine)   Morice 1935

yekhanthîzthai
'he went in search of him'

Vol. 2, 520

rheyenthûtsêł
'they will cut it down with an axe'

Vol. 2, 530

łtṣĕnadîskhê
'he stood erect again'

Vol. 2, 521

áhodidiniishtłóóh   **Navajo**

a⁄-ho-di-di-ni-ish-ø-tłóóh

I'm relaxed (nervous tension), I'm overcoming anxiety

áhodiyiilkah

á-ho-di-yi-i-l-kah

we're dilly-dallying along (3 or more subjects).

bidádinish'aah

bi-dá-di-ni-ish-ø-'aah

I close it with it, to block the entranceway or hole with it (a rock)

ch'íhi'niilchééh

ch'í-hi-'a-ni-i-l-chééh

we run out and come into view, running (2 actors)

áhodidiniisht<u>łóóh</u>

á-ho-di-di-ni-ish-ø-tłóóh

I'm relaxed (nervous tension), I'm overcoming (my) anxiety

Last syllable is the base –verb stem

áhodiyiil<u>kah</u>

á-ho-di-yi-i-l-kah

we're dilly-dallying along with them (3 or more subjects).

bidádinish'<u>aah</u>

bi-dá-di-ni-ish-ø-'aah

I close it with it, to block the entranceway or hole with it (a rock)

ch'íhi'niil<u>chééh</u>

ch'í-hi-'a-ni-i-l-chééh

we run out and come into view, running (2 actors)

STEMS

áhodidiniish-   ł-**tłóóh**

-**TLOOH** loosen something taut

áhodiyii-   l-**kah**

-**KAH** walk moving slowly 3+

bidádinish-   ø-**'aah**

- ʻ**AAH** handle a round solid object

ch'íhi'nii-   l-**chééh**

-**CHEEH** move rapidly 2+

VALENCE = 'CLASSIFIERS'   PREFIXES TO STEM

áhodidiniish-   ł-tłóóh

-TLOOH loosen something taut

áhodiyii-   l-kah

-KAH walk moving slowly 3+

bidádinish-   ø-'aah

- 'AAH handle a round solid object

ch'íhi'nii-   l-chééh

-CHEEH move rapidly 2+

áhodidiniishtłóóh　　　　　　　　　　**Navajo**
á-ho-di-di.ni-ish-ø-tłóóh

1c-4-4-6.6-7-8-9-stem

refl-space-self-prolongative-transitional-Mode-Sub-Vl-'slacken'

I'm relaxed (nervous tension), I'm overcoming (my) anxiety

　　　　　　　　　　　　　　　　YMD:284

ádi refl? =   áhodi ?

hi' = 'ahi   di- ?

ch'íhi'niilchééh

ch'í-'a.hi-ni-i-l-chééh

1b-6a.5.5-7-7-8-9-stem

out horizontally-reciprocative.3ʳᵈ-extended-Mode-3ʳᵈsu-
  Vl-'chase'

we run out and come into view, running (2 actors)

　　　　　　　　　　　　　　YMD:284

The verbal complex

- IA Template
- Issues w template
    examples of words and glosses

Q's

- what are the forms of combination
- how are they organized
- how productive are they
- what can they express
    - meanings & speakers access to meaning
- can we predict (produce) real forms
    - learnable?

- Model of the Dene verbal complex

what is Item-and-Arrangement (IA)/
        Item-and-Process (IP) morphology?

What is templatic morphology?

Implications of IA/IP models of morphology

linear structure of slots or positions
   morphemes are assigned to slots
   slots handle the ordering of morphemes

- compositionality and transparency
- existence of separable morphemes

how does an IA or IP template work?

IA /IP morpheme based models
Item-and-Arrangement
Item-and-Process

ABCDE   A-B-C-D-E

A -   B - C - D   - E
___   ___   ___   ___   ___

Prosthetic ordering devices

IA /IP morpheme based models
   Item-and-Arrangement
   Item-and-Process

   ABaseCDE   A-Base-C-D-E

   A - **Base** - C   -   D   -   E
   ___   ___   ___   ___

Base of attachment: prefixes (A) and suffixes (C-D-E)

IA /IP morpheme based models
Item-and-Arrangement
Item-and-Process

ABaseD

A - Base - D

Ordering devices

IA /IP morpheme based models
   Item-and-Arrangement
   Item-and-Process

BaseCD   Base-C-D   *hopelessness*

Base   C - D
        ____   ____

hope   - less-   ness

Ordering devices

IA /IP morpheme based models
Item-and-Arrangement
Item-and-Process

*BaseDC   Base-*D-C

* hope-ness-less
Base   *C*   *D*

_____   _____ _____ _____

hope   - less-   ness

Ordering devices

IA /IP morpheme based models
Item-and-Arrangement
Item-and-Process

ABCDE   A-Base-C-D-E

A - **Base** - C - D - E

Base of attachment: prefixes (…A) and suffixes (C….)

Problems of IA/IP models -of morphology

- ill-defined terms 'morpheme'
- dependence on fully inflected forms
-        for reconstruction
- supported by rewrite rules
- cannot predict forms
- does not address relations among words
- does not address organization of lexicon
  - conjugation classes
  - learnability

The Athabaskan template -Navajo

Position class template for Navajo verb
Hoijer 1967; Young and Morgan 1987)

KEY (from left to right):

0	*Direct object of postposition.* *Possessive prefix with nouns.*	
Ia	Null postposition	
Ib	Adverbial – Thematic ('postpositional stems')	
Ic	(Reflexive)	**Disjunct**
Id	(Reversionary)	
Ie	(Semeliterative)	
II	(Iterative)	
III	(Distributive Plural)	

IV	Direct Object Pronouns	
V	Deictic Subject Pronouns	
VIa	Adverbial – Thematic	
VIb	Adverbial – Thematic	
VIc	Transitional / Semelfactive Aspect markers	**Conjunct**
VII	Modal - Aspectival Conjugation markers	
VIII	Subject Pronouns	
IX	'Classifier'	

X	Stem	**Stem**

0		Ia	Ib	Ic	Id	Ie	II	III	IV	V	VIa	VIb	VIc	VId	VII	VIII	IX	X
Object (& Possessive) Pronoun	Postpositional Stem	Derivational & Thematic	Indirect Object Pronoun	Reflexive Pronoun	Reversionary	Semeliterative	Iterative Mode	(Dist. Plural Marker	Direct Object Pronouns	Deictic Subject Pronouns	Derivational & Thematic	Inceptive	Derivational & Thematic	Seriative & Aspectival	Modal & Aspectival	Subject Pronouns	Classifier	STEM
shi- 1. shi-, sh- ni- 2. ní-, n- bi- 3. bí-, b- yi- 3o. yí-, y- ha-, há-, h-, hw 'a- 3i. 'á-, '- nihi- 1. nihi-, nih- nihi- 2. nihí-, nih- Reflexive: 'á-, 'ádí Reciprocal: 'ah-, 'al', 'alh-, 'ahil-, 'alhil-	-a-(-a'), on loan -aa, to, toward -'a-, over -aah, alongside -ááh, passing by -ááh, passing by -ba, to exhaustion -ba', waiting for -chá, bunched up -ch'ááh, obstruct -ch'į', toward -ch'o-, helping -dá-, close, seal -da-, cover -dááh, meeting -de, above, excess -é-, about, in -í-, against -iih, into -ii', inside of -ił, with -gha-, away from -ghá-, through -ghééh, attaching -ká, for, after -ka, for, after -káá', on, above -kéé', following -k'ééh, against -k'ee'ąą, around -k'i, on, on top -k'í, on, upon -lá-, beyond -lák'e-, in hand -nah, extend over -na-, around -ná-, encircling -ná, beside -ní-, into -níká-, through -niiłt'a-, obstac -'oh, less -tá-, grazing -tah, among -taa-, among -ta', between -t'a-, recess -t'ah, recess -t'ááh, midst -tis, over -tsi, first -ts'ąą, from -ts'ąą', from -ts'á-, from -ya-, down -yah, under -yaa, under	'a-, away 'á-, thematic 'á-, thus 'ada-, downward 'ahá-, in half 'a'é-, into hole 'aso-, thematic 'atí-, harm 'atsí-, decision 'ááh, 'ááł-, mean cha-, darkness ch'aa-, visiting ch'í-, out horiz. cho-, use dá-, close, seal di-7, fire dzi-, into space dzídza-, into fire ha-, up out ha-, entire ha-, thematic há-, for, after há-, pointed hasht'e-, ready la-, sickly kéé-, thematic ki-, sloping ko-, thus k'é-, friendship k'e-, undo, untie k'i-, them.(plant) k'í-, straight k'í-, sever lí-, cheating na-, around about na-, across na-, downward ná-, encircling ná-, thematic ná-, up, upward ná-, repetition ni-1, cessative niki-, start niki-, surface ntsi-, think shó-, acquire so-, prayer ta-, mix tá-, diversative tá-, wash ti-, hurt, harm ti'-, suffer tsi'-, zigzag tsístł'a-, corner wó'ą-, over edge ya-, vertical ya-, thematic(talk)	'á-, me 1. shi-, me 2. ni-, you 3. b', him, her, it, them 3o. yi-, him, her, it, them 3a. ha-/ho-, him, her, one, people them 3i. 'a-, someone, something 1. nihi- us 2. nihi-, you Reflexive 'ádi-, self Reciprocal 'ahi-, each other, converging, joining	'á-, self	ná-(nér ní-, ń-), returning back to a previous location or status	nááná-/ nááná-, repeated one more time, once again	ná-(né ní-, ń-, repetition	da-(de-), distributive plurality = each of three or more	1. shi-, sh-, me 2. ni-, n- you 3. bi-,b-,ø, him, her it, them 3o. yi-, y-, him, her it, them 3a. ha-,ho- hw-, him her, one people, them 3i. 'a- ('-, 'e-, 'i-, 'o-), indefinite someone, something 3s. ha-,ho-, hw-, space, area, impersonal it, "things" 1. nihi- nih-, us 2. nihi-, nih-, you (2 or more) Reflexive: -di-, 'á-di-, self Reciprocal: 'ahi-, 'al-hi- ('ah-, 'alh-), each other, one another	ji- (-zh-, -rh-, -r-), he, she, one, people, they 'a-, indefinite someone something -'(a)-r- unspecified agent (Agentive Passive) ha-/ho-, hw-, space, area, it, "things"	di-2 di-3 di-4 di-5 di-6 di-8 di-9 di-10 di-11 di-12 di-13 di-14 dzi (-i-z-, -zh-) hi-1 hi-2 'i- ji- łi- (-l-) si-1 si-2 si-3 yi-1 yi-2 yi-3 yi-4 yi-5 yi-6 yi- (w-)	di-1 (inceptive)	ni-2 ni-3 ni-4 ni-5 ni-6 ni-8 ni-9 ní-1 ní-2	vi-1 vi-2	-í- (-'-), Perfective Mode Marker yi-, Progressive Mode Marker vi-, Modal-Aspectival (Completive Perfective) ni-7, Modal-Aspectival (Terminative Imperfective & Perfective) yi-, Peg-element with ø-Imperfective si-, Modal-Aspectival (Stative Imperfective & Perfective) -ó- (-o-, wó-wo-), Optative Mode Marker	1. -sh-, -ø- 2. -ni-, -'-, -ø- 3. -ø- 1. -ii(d) 2. -o(h)-, -oo-	-ø- -ł- -d- -l-	THE VERB PREFIX POSITIONS

DISJUNCT									CONJUNCT										
0	00	Ia	Ib	Ic	Id	Ie	II	III	IV	V	VIa	VIb	VIc	VId	VII	VIII	IX	X
Object (& Possessive) Pronoun	Postpositional Stem	Derivational & Thematic	Indirect Object Pronoun	Reflexive Pronoun	Reversionary	Semeliterative	Iterative Mode	(Dist. Plural Marker	Direct Object Pronouns	Deictic Subject Pronouns	Derivational & Thematic	Inceptive	Derivational & Thematic	Seriative & Aspectival	Modal & Aspectival	Subject Pronouns	Classifier	
shi- 1. shí- sh- ni- 2. ní- n- bi- 3. bí- b- yi- 3o. yí- y- ha- 3a. há- h- hw 'a- 3i. 'á- '- nihi- 1. nihi- nih- nihi- 2. nihí- nih- Reflexive: 'á-, 'ádí- Reciprocal: 'ah-, 'ał- 'ałh- 'ahił- 'ałhił-	-a-(-a'), on loan -aa, to, toward -'ą-, over -ąąh, alongside -ą́ą́-, passing by -ą́ąh, passing by -ba, to exhaustion -ba', waiting for -chá-, bunched up -ch'ą́ąh, obstruct -ch'į', toward -ch'o-, helping -dá-, close, seal -da-, cover -dááh, meeting -de, above, excess -é-, about, in -í-, against -iih, into -ii', inside of -ił, with -gha-, away from -ghá-, through -ghą́ąh, attaching -ká, for, after -ka-, for, after -káá', on, above -kéé', following -k'ą́ąh, against -k'ee'ąą, around -k'i, on, on top -k'í, on, upon -łá-, beyond -łák'e-, in hand -nah, extend over -na-, around -ná-, encircling -ná, beside -ní-, into -níká-, through -niiłt'a-, obstac -'oh, less -tá-, grazing -tah, among -taa-, among -ta', between -t'a-, recess [illegible] -t'ááh, midst -tis, over -tsi, first -ts'ąą, from -ts'ą́ą', from -ts'á-, from -ya-, down -yah, under -yaa, under	'a-, away 'á-, thematic 'á-, thus 'ada-, downward 'ahá-, in half 'a'ą́-, into hole 'aso-, thematic 'atí-, harm 'atsí-, decision 'ááh-, 'á[illegible] cha-, darkness ch'aa-, visiting ch'í-, out horiz. cho-, use dá-, close, seal da-, cover di-^{7}, fire dzi-, into space dzídza-, into fire ha-, up out ha-, entire[illegible] ha-, thematic há-, for, after há-, pointed hasht'e-, ready ła-, sickly kéé-, thematic kí-, sloping kó-, thus k'é-, friendship k'e-, undo, untie k'i-, them. (plant) k'í-, straight k'í-, seve[illegible] łí-, che[illegible] na-, around about na-, across na-, downward ná-, encircling ná-, thematic ná-, up, upward ná-, repetition ni-^{1}, cessative niki-, start niki-, surface ntsi-, think shó-, acquire [illegible] ta-, mix tá-, diversative tá-, wash ti-, hurt, harm ti'-, suffer tsi'-, zigzag tsístł'a-, corner wó'ą-, over edge yą-, vertical yá-, thematic (talk)	1. shi-, me 2. ni-, you 3. bi-, him, her, it, them 3o. yi-, him, her, it, them 3a. ha-/ho-, him, her, one, people, them 3i. 'a-, someone, something 1. nihi-, us 2. nihi-, you Reflexive 'ádi-, self Reciprocal 'ahi-, each other, converging, joining	'á-, self	ná-(né-, ni-, [illegible] ing back to a previous [illegible] or status	náá-/náání-, repeat[illegible] one more time, once again	ná-(né-, ní-, n-, repetition	da- (de-) [illegible] plurality = [illegible] three or more	1. shi-, sh-, me 2. ni-, n-, you 3. bi-, b-, ø, him, her, it, them 3o. yi-, y-, him, her, it, them 3a. ha-, ho-, hw-, him, her, one, people, them 3i. 'a- ('-, 'e-, 'i-, 'o-), indefinite, someone, something 3s. ha-, ho-, hw-, area, space, impersonal it, "things" 1. nihi-, nih-, us 2. nihi-, [illegible] (2 or more) Reflexive: -di-, 'á-di-, self Reciprocal: 'ahi-, 'ał-, [illegible] 'ałh-), each other, one another	ji- (-zh-, -dz-), he, she, one, people, they 'a-, indefinite someone, something -'(a)-di-, unspecified [illegible] (Agentive Passive) ha-/ho-, hw-, space, impersonal it, "things"	di-^{2} di-^{3} di-^{4} di-^{5} di-^{6} di-^{8} di-^{9} di-^{10} di-^{11} di-^{12} dí-^{13} dí-^{14} dzi (ji-) [illegible] hi-^{2} [illegible] łi- (-ł-) si-^{2} si-^{3} yi-^{1} yi-^{2} yi-^{3} yi-^{4} yi-^{5} yi-^{6} yi- yi- [illegible]	di-^{1} (inceptive)	ni-^{2} ni-^{3} ni-^{4} ni-^{5} ni-^{6} ni-^{8} ni-^{9} ní-^{1} ní-^{2}	yi-^{1} yi-^{2}	-i- (-'-), Perfective Mode Marker yi-, Progressive Mode Marker yi-, Modal-Aspectival (Completive Perfective) ni-^{7}, Modal-Aspectival (Terminative Imperfective & Perfective) yi-, Replacement with ø-Imperfective si-, Modal-Aspectival (Stative Imperfective & Perfective) -ó- (-o-, wó-, wo-), Optative Mode Marker	1. -sh-, -ø- 2. -ni-, -'-, -ø- 3. -ø- 1. -ii(d)- 2. -o(h)-, -oo-	-ø- -ł- -d- -l-	STEM

THE VERB PREFIX POSITIONS

the whole element is a word?

word structure is prefixal

final syllable is the stem

rightmost element in the template

all obligatory marking is in the final two syllables

in the last 4 slots

the remainder is an ordering device

interdependencies (discontinuous dependencies)

misorderings

	DISJUNCT								CONJUNCT								
0	∞	Ia	Ib	Ic	Id	Ie	II	III	IV	V	VIa	VIb	VIc	VId	VII	VIII	IX
Object (& Possessive) Pronoun	Postpositional Stem	Derivational & Thematic	Indirect Object Pronoun	Reflexive Pronoun	Reversionary	Semeliterative	Iterative Mode	(Dist. Plural Marker	Direct Object Pronouns	Deictic Subject Pronouns	Derivational & Thematic	Inceptive	Derivational & Thematic	Seriative & Aspectival	Modal & Aspectival	Subject Pronouns	Classifier

dimensionality parameters are enormous

positions: 7   6a, b, c, 3, 2, 1b, d, e

Modes	Aspects	Subaspects
Imperfective	Momentaneous	Inceptive
Perfective	Continuative	Inchoative
Usitative	Durative	Semeliterative
Iterative	Repetitive	Serative
Progressive	Conclusive	Stative
Future	Semelfactive	Completive
Optative	Distributive	Terminative
	Diversative	Terminal
	Reversative	Prolongative
	Conative	Reversionary
	Transitional	
	Cursive	

Jay Williams, 2004 -from Young and Morgan 1987

Position class template for Navajo verb
Hoijer 1967; Young and Morgan 1987)

KEY (from left to right):

0	*Direct object of postposition.* *Possessive prefix with nouns.*	
Ia	Null postposition	
Ib	Adverbial – Thematic ('postpositional stems')	
Ic	(Reflexive)	**Disjunct**
Id	(Reversionary)	
Ie	(Semeliterative)	
II	(Iterative)	
III	(Distributive Plural)	

IV	Direct Object Pronouns	
V	Deictic Subject Pronouns	
VIa	Adverbial – Thematic	
VIb	Adverbial – Thematic	
VIc	Transitional / Semelfactive Aspect markers	**Conjunct**
VII	Modal - Aspectival Conjugation markers	
VIII	Subject Pronouns	
IX	'Classifier'	

X	Stem	**Stem**

áhodidiniishtłóóh   **Navajo**

á-ho-di-di.ni-ish-ø-tłóóh

1c-4-4-6.6-7-8-9-stem

refl-space-self-prolongative-transitional-Mode-Sub-Vl-'slacken'
I'm relaxed (nervous tension), I'm overcoming (my) anxiety
                                          YMD:284

ádi refl? =   áhodi ?

hi' = 'ahi   di- ?

ch'íhi'niilchééh

ch'í-'a.hi-ni-i-l-chééh

1b-6a.5.5-7-7-8-9-stem

out horizontally-reciprocative.3rd-extended-Mode-3rdsu-
    Vl-'chase'
we run out and come into view, running (2 actors)
                                          YMD:284

Athabaskan verbal complex

is this a verb?

in order to provide a realistic, parsable model
reduce the parameters of morphological variation
     provide more transparency
make some attempt at realistic word formation

Task:

Identify

- the constituent elements in the verbal
      complex
- their arrangements
- combinatorial operations
- the patterns in the lexicon

Summary: Empirical / methodological motivations

- Template has never worked as a morphological model
- Hargus, 1987; Randjoda, 1989; McDonough 1990, 1999, 2003 Kari 1990 ….

- Morpheme based model is derived from fully inflected forms. and refers specifically to a given form to govern recomposition

- Over- and under- generates forms
  - 17 - 23 dimensions of variation
  - no prediction of the lexical patterns
  - declarative constraints

- Position classes are not formal devices
  - invented as a comparative device
  - unmotivated
  - prosthetic

morphological terminology

morphological terminology

Polysynthetic   Agglutinative   Analytic

'hard'   'easy'

Analytic - simple words without 'morphology'
Aggluntinative - obvious separable morphemes
    'strung out like beads'
Polysynthetic - units (words) with complex structures
    w complex meanings - not easily separable

morphological terminology

a paradigm = a set of inflected variants of a word form via exponence

paradigms are formed through a regular or a predictable pattern of alternations among words

fundamental to the organization of the lexicon

morphological terminology

Definitions

　　　　'Morpheme'

= sound meaning unit?

= smallest unit of meaning?

morphological terminology

Definitions

'~~Morpheme~~'

handy term for a sublexical unit of many kinds
no formal definition
refers to no formal entity
not sound or meaning

thus *not well-defined*
not a combinatorial unit/element in a grammar

Definitions

1. LEXEME
2. Word form vs word class/family
3. Inflection vs derivation
          Compounding
4. Paradigm Economy

LEXEME   vs   Word form/token

- **LEXEME** - abstract dictionary ENTRY (CAPS)
- **Word form** - actual spoken form, physical signal
- **Paradigm** - A set of words that belong to the same
  LEXEME   aka *inflectional morphology*
- **Word family**   Set of related LEXEMES

Hapselmath & Sims, 2012

Word families (= groups of LEXEMES)

- READ READABLE UNREADABLE READER REREAD
- CAT CATTY CATLIKE CATNESS
- DIVINE DIVINITY DIVINENESS DIVINING

LEXEMES in a Word Family are less 'predictable' than related word forms in an inflectional paradigm

Hapselmath & Sims, 2012;
Aronoff and Fudeman, 2010

Derivation = relations between LEXEMES of a word family
aka*: LEXEME formation*

compounding is a type of LEXEME *formation*

Inflection = relation between word forms of a LEXEME
aka: *word form formation*

Hapselmath & Sims, 2012

Inflectional Paradigm   Infl P
   a paradigm

Inflectional Classes   Infl Cl
   a LEXEME's Infl Ps
   i.e. conjugations, declensions, noun and gender classes

Hapselmath & Sims, 2012

Latin conjugational paradigms (InfP)

	sing	plural	tense/mode
1	*porto* *I carry*	*portamus*	present
2	*portas*	*portatis*	
3	*portat*	*portant*	
3	*porta:bat* *he was carrying*	*portabant*	imperfect
3	*porta:vit* *he carried*	*porta:ve:runt*	perfect

LEXEME = PORTO

Latin conjugational paradigms (InfP)

	sing	plural	tense/mode
1	*port-o* *I carry*	*port-amus*	present
2	*port-as*	*port-atis*	
3	*port-at*	*port-ant*	
3	*port-a:bat* *he was carrying*	*port-abant*	imperfect
3	*port-a:vit* *he carried*	*port-a:ve:runt*	perfect

Latin conjugational paradigms (InfP)

	sing	plural	tense/mode
1	*port-o* *I carry*	*port-amus*	present
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3	*port-at*	*port-ant*	
3	*port-a:bat* *he was carrying*	*port-abant*	imperfect
3	*port-a:vit* *he carried*	*port-a:ve:runt*	perfect

Latin conjugational paradigms (InfP)

	sing	plural	tense/mode
1	*porto* *I carry*	*port**a**-mus*	present
2	*port-**a**-s*	*port-**a**-tis*	
3	*port-**a**-t*	*port-**a**-nt*	
3	*port-**a**-:bat* *he was carrying*	*port-**a**-bant*	imperfect
3	*port-**a**-:vit* *he carried*	*port-**a**-:ve:runt*	perfect

***InflClass* (InfC)**

all words that participate in the same inflectional pattern

1st conjugation:
  amó, amáre, amáví, amátum
  júdicó, júdicáre, júdicáví, júdicátum
  nárró, nárráre, nárráví, nárrátum

2nd conjugation
  habeo, habere, habui, habitus.

3rd – 4th conjugations

the Athabaskan verb complex

Three morphological domains in the Dene verb:

[Disjunct # Conjunct - Stem] $_{WdVerb}$

The positions are numbered by roman numerals in Y&M.

Disjunct	Conjunct	Stem
0 Ib Ia Ic Id II III	IV V VIa VIb VIc **VII VIII IX**	**X**

Null morphemes

Three morphological domains in the Dene verb:

[Disjunct # Conjunct - Stem] ~WdVerb~

The positions are numbered by roman numerals in Y&M.

																Stem
			Disjunct										Conjunct			Stem
0	1a	1b	1c	1d	2	3	4	5	6a	6b	6c	**7**	**8**	**9**		**X**

Null morphemes

1   *bíni'estsih*   *3rd subj*

bí-ni-'a-**si-ø-**ł-tsih   **si-ø → es   3rd**

1B-1B-5-**7-8-**9-STEM

   To peg down an object, like a hide, to dry on a wall or against the floor
   (ł-tsih to cause to stick, (using) a slender object)
   (bíni' -> bí-ni-'a   'refers to the action of penetrating the surface of some
                inanimate thing (-'a), without passing entirely through'

bíni'séłtsih   *1st subj*

bí-ni-'a-**si-ish-**ł-tsih   **si –ish → sé 1st**

IB-IB-5-**7- 8-** 9-STEM

2 *bí-ni-'a-**ni-**ish-ł-tsih ?*   ~~ni-ish ?~~   **does not exist**

   IB-IB- 5- **7-**   8-9-STEM

            position 9 sometimes deletes
            what's a ø (null) morpheme?
            how changeable are the morphemes
            how 'real are the morphemes

bíni'sétsih   bíni'estsih

To peg down an object, like a hide, to dry on a wall or against the floor
 (ł-tsih to cause to stick, (using) a slender object)
 (bíni' -> bí-ni-'a   'refers to the action of penetrating the surface of some inanimate
    thing (-'a), without passing entirely through'

béégashii bikágí́   bíni'séłtsih

béégashii   bi-kágí́   bíni-'a –[**es + ł.tsih**]

cow   3rd-hide   'against it'-'surface'-S.PVF.3S + VL.'cause
    to stick'

'he pegged down the cow hide'

bíni'séłtsih   bíni'estsih

To peg down an object, like a hide, to dry on a wall or against the floor
(ł-tsih to cause to stick, (using) a slender object)
(bíni' -> bí-ni-'a   'refers to the action of penetrating the surface of some inanimate
    thing (-'a), without passing entirely through'

béégashii bikágî́   bíni'estsih

béégashii   bi-kágî́   bíni-'a - [**sé + ł.tsih**]

cow   3rd-hide   'against it'-'surface'-3I-S.PVF.1S +
    VL.'cause to stick'

'I pegged down the cow hide'

       bí-ni-'a-**si-ish**-ł-tsih
       IB-IB-IV-**VII-VIII**-XI-STEM
       bíni'a -   [**sé +   ł.tsih**]core verb

bíni'séłtsih

Disjunct	Conjunct							Stem
0 1b 1a 1c 1d 2 3	4	5	6a	6b	6c	7 8	9	X

[**Core verb**]

σ + σ

sé   *ł.tsih*

Minimal verb = σ σ

yishcha   *'I cry'*   →   (y)ischa

ø-   *ish-*   ø-   cha

mode-   subj-   VL-   stem 'cry'$_{IPV}$

   7   8   9

yicha   *'he cries'*

ø- ø- ø-cha   *øcha* →   (yi)cha

yisdzid   *' I shake it'* →   (y)isdzid

  ø-   *ish-*   ł-   dzid

mode-   subj-   Vl-   stem 'agitate'$_{IPV}$

 7   8   9

yiłdzid   *'he shakes it'*

ø- ø- ł-dzid   *øłdzid* → (yi)łdzid

Minimal verb = σ σ

ø morphs = minimum specification in the verb
   carry specific morphosyntactic values:
      mode person number and *valence*
        IPV   3rd   sing   ø

yisdzid   'I shake it'   →   (y)isdzid
  ø-   *ish-*   ł-   dzid
   IPV- 1st -   Vl-   stem 'agitate'
   7   8   9

yiłdzid   'he shakes it'
ø- ø- ł-dzid   *øłdzid* →   (yi)łdzid

Minimal verb = σ σ

DZID to agitate or shake around, slosh around 326g

yisdzid   *I shake it*
yish   łdzid

nanisdzid   *I shake it around, gargle it*
na- nish łdzid

’adádiisdzid   *I swallow it*
 ’a-di-á-d-i-ish ødzid

YM 1987:37-38

Disjunct	Conjunct	Stem
0 Ib Ia Ic Id II III	IV V VIa VIb VIc VII VIII IX	X

[Core   verb]

σ σ

core verb = last four position
    = rightmost two syllables

ϕ - ϕ - ϕ- cha ??

KEY (from left to right):

0	*Direct object of postposition.* *Possessive prefix with nouns.*	
Ia	Null postposition	
Ib	Adverbial – Thematic ('postpositional stems')	
Ic	(Reflexive)	**Disjunct**
Id	(Reversionary)	
Ie	(Semeliterative)	
II	(Iterative)	
III	(Distributive Plural)	

IV	Direct Object Pronouns	
V	Deictic Subject Pronouns	
VIa	Adverbial – Thematic	
VIb	Adverbial – Thematic	
VIc	Transitional / Semelfactive Aspect markers	**Conjunct**
VII	Modal - Aspectival Conjugation markers	
VIII	Subject Pronouns	
IX	'Classifier'	

X	Stem	**Stem**

CORE VERB

σ

σ

Disjunct	Conjunct						Stem [Core verb]
0 1b 1a 1c 1d 2 3	4 5	6a	6b	6c	7 8	9	X

σ + σ

yish
yi   ł.dzid

Morphology 1ˢᵗ person singular, imperfective

inflectional pattern

yish kah	I accompany them
yishkaad	I toss it
yishkááh	I track it
yishkaah	I move / handle it
yishkááł	I am carrying it (in an open container
.....	

yish = *ØIPV.1S*

combinatorial units of positions 7 8 9
mode subject classifier (valence)

7	8	9
ø	(y)ish	ø
ni	ni	ł
si	ø	d
yi	ho	l
	'a	
	ji	
	ii(d)	
	(w)oh	

InflP 4 primary conjugations - 16 conjugations

PERSON	I. IMPERFECTIVE				II PERFECTIVE	
	Ø	NI-	SI-	YI-Ø	SI	
sgl.					Ø - Ł	D - L
	(1)	(2)	(3)	(4)		
1.	**yish**	nish	shi	yiish	**sé**	sis
2.	**ni**	ní	sí	sii	**síní**	síní
3.	**yi**	yí	–	yii	**si**	yís
3o.	**yi**	yí	–	yiyii	**yiz**	–
3a.	**ji**	jí	–	jii	**jiz**	jis
3i.	**'a**	'í	–	'ii	**'az**	'as
3s.	**ha**	hó	–	hwo	**haz**	has

Base (1ST ,2ND ,3RD SING) and Extended (3O,3A,3I,3S) Paradigms
Y&M 1987:200
for 4 IPV modes and for 2 SPFV modes.

two most common are ø and n conjugations

n-IPV

	sing	dual
1	nísh	nii(d)
2	ní	noh
3	(y)í jí	

n-PFV (ø-ł)

	sing	dual
1	ní	nii(d)
2	yíní	noo
3	ní jí	

16 conjugation patterns have been observed in Athabaskan
Navajo, Young and Morgan, 1987
Tsuut'ina, Starlight and Donovan,1990; Cox, 2009

MODE PARADIGMS

4 conjugational classes = InflCls
ø   n   s   yi (gamma)

- MODE inflected for person and number

Subject marking - exponent on MODE

MODE CONJUGATIONS
are the base of (**T**)**AM DOMAIN**

	IMPERFECTIVE	ITERATIVE	PERFECTIVE Ø−Ł	PERFECTIVE L−D	SPERFECTIVE Ø−Ł	SPERFECTIVE L−D
			YI-		SI	
1	yish	násh	yí	yish	sé	sis
2	ni	nání	yíní	yíní	síní	síní
3	yi	ná	yí	yi	si	yis
3o	yi	néí-	yiyíí	yoo	yiz	
3i	’a	ná’á	´í	’oo	’az	’as
1	yii	néii	yii	yii	dasii	sii
2	woh	náh	woo	wooh	dasoo	sooh

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bits'a'nísht'ááh

bi-ts'a-'a-nísh - ł.t'ááh

[npfv.1s   fly]core verb n-conjugation

I (flew away) left (it) behind

The Navajo Language
Young and Morgan 1987:d247

	sing	dual	mode
1	*bits'a'nísht'ááh* *I (fly away) leave it*	*bits'a'niit'ááh*	IPV
2	*bits'a'nít'ááh*	*bits'a'nóht'ááh*	
3	*yits'a'nít'ááh*	----	
3a	*bits'a'jít'ááh*	*bits'a'da'jít'ááh*	*plural*
3	*yits'a'nít'a'*	*yits'a'da'ast'a'*	PVF

	sing	dual	mode
1	*bits'a'nísht'ááh* *I (fly away) leave it*	*bits'a'niit'ááh*	IPV
2	*bits'a'nít'ááh*	*bits'a'nóht'ááh*	
3	*yits'a'nít'ááh*	----	
3a	*bits'a'jít'ááh*	*bits'a'<u>da'</u>jít'ááh*	*plural*
3	*yits'a'nít'a*́'	*yits'a'da'ast'a*́'	PVF

	sing	dual	mode
1	*bits'a'nísht'ááh* *I (fly away) leave it*	*bits'a'niit'ááh*	IPV
2	*bits'a'nít'ááh*	*bits'a'nóht'ááh*	
3	*yits'a'nít'ááh*	----	
3a	*bits'a'jít'ááh*	*bits'a'da'jít'ááh*	*plural*
3	*yits'a'nít'a͆'*	*yits'a'da'ast'a͆'*	PVF

contrast sets

	sing	dual	mode
1	*bits'a'nísht'ááh* *I (fly away) leave it*	*bits'a'niit'ááh*	IPV
2	*bits'a'nít'ááh*	*bits'a'nóht'ááh*	
3	*yits'a'nít'ááh*	----	
3a	*bits'a'jít'ááh*	*bits'a'da'jít'ááh*	*plural*
3	*yits'a'nít'a*́	*yits'a'da'ast'a*́	PFV

contrast sets

	sing	dual	mode
1	*bits'anísh t'ááh*	*bits'a'nii t'ááh*	IPV
	I (fly away) leave it		
2	*bits'a'ní t'ááh*	*bits'a'nóh t'ááh*	
3	*yits'a'ní t'ááh*	----	
3a	*bits'a'jí t'ááh*	*bits'a'da'jí t'ááh*	*plural*
3	*yits'a'ní t'a'*	*yits'a'da'as t'a'*	PVF

contrast sets

	sing	dual	mode
1	*bits'anísh* *t'ááh* *I (fly away) leave it*	*bits'a'nii* *t'ááh*	IPV
2	*bits'a'ní* *t'ááh*	*bits'a'nóh* *t'ááh*	
3	*yits'a'ní* *t'ááh*	----	
3a	*bits'a'jí* *t'ááh*	*bits'a'da'jí* *t'ááh*	
3	*yits'a'ní* *t'a'*	*yits'a'da'as* *t'a'*	PFV

contrast sets

	sing		dual		mode
1	*bits'anísh*	*øt'ááh*	*bits'a'nii*	*øt'ááh*	IPV
	I (fly away) leave it				
2	*bits'a'nį́*	*øt'ááh*	*bits'a'nóh*	*øt'ááh*	
3	*yits'a'nį́*	*øt'ááh*		----	
3a	*bits'a'jį́*	*øt'ááh*	*bits'a'da'jį́*	*øt'ááh*	*plural*
3	*yits'a'nį́*	*øt'aʹ*	*yits'a'da'as*	*øt'aʹ*	PFV

contrast sets

	sing	dual	mode
1	*bits'anísh*	*bits'a'nii*	IPV
2	*bits'a'ní*	*bits'a'nóh*	
3	*yits'a'ní*	----	
3a	*bits'a'jí*	*bits'a'da'jí*	*plural*
3	*yits'a'ní'*	*yits'a'da'as*	PFV

n-IPV (ø)

	sing	dual	mode
1	*bits'a'* *nísh*	*bits'a'* *nii*	IPV
2	*bits'a'* *ní*	*bits'a'* *nóh*	
3	*yits'a'* *ní*	----	
3a	*bits'a'* *jí*	*bits'a'da'* *jí*	*plural*
3	*yits'a'* *ní'*	*yits'a'da'* *as*	PFV

contrast sets n-imperfective

	sing	dual	mode
1	*bits'a'- nísh*	*bits'a'- nii*	IPV
2	*bits'a'- ní*	*bits'a'- nóh*	
3	*yits'a'- ní*	----	
3a	*bits'a'- jí*	*bits'a'da'- jí*	*plural*
3	*yits'a'- ní'*	*yits'a'da'- as*	PFV

contrast sets

	sing	dual	mode
1	*bits'anísht'ááh* *I (fly away) leave it*	*bits'a'niit'ááh*	IPV
2	*bits'a'nít'ááh*	*bits'a'nóht'ááh*	
3	*yits'a'nít'ááh*	----	
3a	*bits'a'jít'ááh*	*bits'a'da'jít'ááh*	*plural*
3	*yits'a'nít'a'*	*yits'a'da'ast'a'*	PFV

*bits'a'nísh*kǫ́ǫ́h   swim away from it

*bits'a'nísh'*eeł   sail away from it

*bits'a'nísh*dlǫǫsh   move away 'on all fours'

*bits'a'nísh*báás   drive away from it

bits'a'nísh *łbáás*   I drive away from it
    1   *2*

Whole word paradigms are necessary

The Dene verb - documentation

- identify the constituent elements
- their arrangements
- combinatorial operations

- Identify the patterns in the lexicon

Identifying constituent forms
learners will reorganize and make use of more transparent and emergent forms.

Dene verb is a compound of two LEXEMES

$$[\ldots[\text{BASE}]_x + [\text{BASE}]_y]_{\text{VC}_{\text{OMPLEX}}}$$
$$\sigma \qquad\qquad \sigma$$

- the two bases represent
  two common types of inflection
  exponence and internal changes

- the resulting compound is an LEXEME

Dene verb is a compound of two LEXEMES

$$[\ldots[\text{BASE}\ ]_x + [\ \text{BASE}\ ]_y]\,\text{VC}_{\text{OMPLEX}}$$
$$\sigma \qquad\qquad \sigma$$

- the **rightmost** element (VL.STEM) is a **LEXEME**
  - STEM SETS inflected for mode, suppletion
  - special status

- **left** element is **MODE LEXEME**
  - MODE person and number,
  - organized into InflP

- Two lexemes are compounded
  - to produce an inflected **word level** LEXEME
  - organized into its own inflectional classes

"...the Na-Dene languages are not one-third as synthetic as they look....What Swanton calls affixes are all independent stems entering into composition, or even little verbs...
It all crumbles into pieces at the least touch...."

Edward Sapir (1921)
excerpts from a letter to A. L. Kroeber

- "All the Carrier verbs are made up of at least two parts, the first of which denotes the tense and person, while the second, namely the ending or stem, contains the main signification of the word."

A.G. Morice (1932), The Carrier Language

Sapir again:
.

"Na-Dene is loosely polysynthetic and fundamentally isolating, monosyllabic elements in a definite order that amalgamate more psychologically than morphologically.

·The Na-Dene languages, probably the most specialized of all, are tone languages and, while presenting a superficially "polysynthetic" aspect are built up, fundamentally of monosyllabic elements prevailingly nominal significance which have a fixed order with reference to each other and combine into morphologically loose 'words'; emphasize voice and "aspect" rather than tense; make a fundamental distinction between active and stative verb forms; make abundant use of post-positions after both nouns and verbs; and compound stems freely."

Encyclopedia Britannica (14th Edition; London and New York, 1929. In Selected Writings of Edward Sapir 1949. Ed. D.G. Mandelbaum p 174-175.

Summary:

- *Athabaskan*
  - population in northern NA – considerable time depth
  - historically small population
    - spread across inaccessible landscape

  - languages have highly complex verbal domains
  - similar morphology
  - don't borrow terms
  - verbal domains stand as propositions
    - with complex semantics elude translation

  - inadequately covered by IA /AP morphology

Summary:

- *Athabaskan verbal complex*

  learnable

  structured

  paradigmatic

  not served by IA/IP morphology

- Mode-Subject position 7-8
  - mode inflected for person and number
  - organized as base conjugations
  - implies structure in the verbal domain

Lecture 2 Phonetics of Navajo

Phonetic data
    the speech habits of a community.

as a basis for
- phonological analyses
- morphological structure
- developing methods for collecting phonetic data
        that address learnability, theoretical issues
- enhances materials used in communities

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