Radically Discontinuous Exponence in the Inflectional Morphology of Na-Dene Languages

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1. Introduction

(1) Main Goals of the Talk

a. Identify the problems that 'radically discontinuous exponence' poses for syntacto-centric models of *inflectional* morphology (if the phenomenon does exist).

b. Show that the Tense-Aspect-Mood (TAM) morphology of Na-Dene languages seems to exhibit this property.

c. Identify and evaluate possible lines of analysis:

(i) <u>The Preferred (but Still Problematic) Approach:</u>
- The TAM morphology in Na-Dene languages is not truly inflectional.
- Rather, it is more akin to a light-verb construction, where a sequence of light Vs happens to encode a TAM meaning.

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2. Syntacto-Centric Models of Morphology and Radically Distributed Exponence

(2) Defining Assumption of a 'Syntacto-Centric' Model of Morphology

Morpho-syntactic structure exists, and is derived (somehow) from syntactic structure 'above the level of the word'.

- Morpho-syntactic structure is created by altering (in a constrained, rule-governed way) a structural representation of a phrasal unit in the language (*e.g.* a clause or DP)

- Possible 'altering operations' include (Halle & Marantz 1993):
  - Head Movement
  - Morphological Merger
  - Fusion
  - Fission
  - Feature Impoverishment

(3) Key Consequence: No 'Morphology-by-Itself' (Aronoff 1994)

- Any morpho-syntactic 'unit' has to be a set of features manipulated by the 'narrow syntax' (*i.e.*, position classes are 'featurally coherent')
- Thus, any morpho-phonological 'unit' must be an exponent of some set of features manipulated by the 'narrow syntax' (unless it is some kind of 'default form')

(5) **'Radically' Discontinuous Exponence**

Cases where a single, primitive inflectional feature is expressed via a discontinuous sequence of morpho-phonological units, none of which are individually the realization of any identifiable inflectional feature.

(6) **Toy, Illustrative Example**

a. Morpho-Phonological Units: Prefixes *ga-* Suffixes *-bi,-si*

b. Inflectional Morphology:

Present:	*ga*-ROOT-*bi*-*si*
Past:	*ga*-ROOT-*si*
Future:	ROOT-*bi*

(7) **Why Is This 'Radically Discontinuous Exponence'?**

a. The Question: What is the exponent of the primitive feature [PRES]

b. The Problem:

(i) Obviously, there is some exponent, since the present tense form doesn't seem to be a 'default' in any sense.

(ii) But, the exponent of [PRES] isn't *ga-* or *-si*, since we also see those prefixes in the past tense forms.

(iii) Also, the exponent of [PRES] isn't *–bi*, since we also see that suffix in future tense forms.

c. Conclusion:
Somehow, the exponent of present tense just *is* the *combination* of *ga-, -bi* and *-si*, none of which seem to be the exponent of [PRES], [PST] or [FUT] (or any other identifiable syntactic feature).

(8) **The Problem Such Systems Raise**

If there really is 'radically discontinuous exponence', then…

a. Problem for Syntacto-Centric Accounts
There are pieces of morpho-phonology which *don't* seem to be realization of any syntactic features at all. (*i.e.*, there *is* 'morphology-by-itself')

b. Problem for *Many* Theories of Morphology (incl. Anderson 1992, Steele 1995):
Individual units of morpho-phonology have no identifiable featural 'trigger', but *combinations* of them do.

(9) **Question 1**
But, don't some syntacto-centric models like Distributed Morphology provide a means for analyzing cases of discontinuous exponence?

(10) **Answer 1**
Yes, if by 'discontinuous exponence' we mean the less problematic phenomenon in (11).

(11) **(Non-Radically) Discontinuous Exponence [Campbell 2009]**

Cases where the features of a single syntactic head H are expressed via a discontinuous sequence of morpho-phonological units, *each of which is the realization of some subset of features on H*.

(12) **Illustrative Example: Potawatomi Independent Order**

k-wapm-a-s'i-m-wpunin-uk
AgrS-V-**<u>AgrO</u>**-NEG-**AgrS**-TNS-**<u>AgrO</u>**
2nd-*see*-**<u>3</u>**-*not*-**2pl**-PRETERIT-**<u>3pl</u>**
You (pl) did not see them. (Halle & Marantz 1993: 140)

(13) **Why This is Less Problematic**

- The individual morpho-phonological units have an identifiable, coherent featural 'trigger'…
- …Thus, they can each be viewed as the exponent of some identifiable inflectional feature(s).
- (The only analytic challenge is getting those morpho-syntactic features where we see them in the phonological form of the word…)

(14) **Question 2**
OK, but do clear cases of such 'radically discontinuous exponence' really exist?

(15) **Answer 2**

- The Tense-Aspect-Mood (TAM) systems of Na-Dene languages (Tlingit, Athabaskan) look very much like real examples of this.

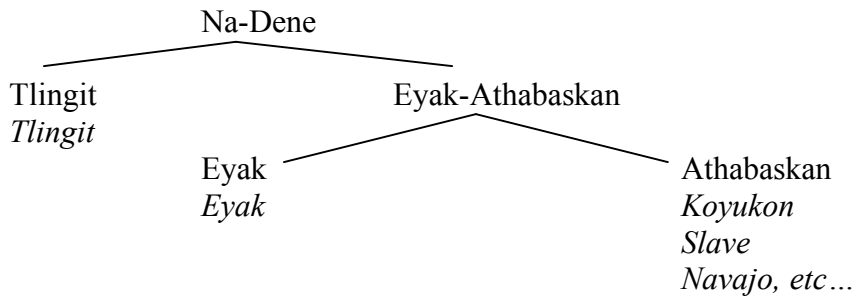
- In fact, amongst specialists (including language teachers/learners), this is typically *the way* in which these systems are described.

However, while specialists in Na-Dene languages are used to the idea of radically discontinuous exponence…
… the significance of this phenomenon for morphological theory has not been highlighted

3. Radically Discontinuous Exponence in Tlingit

(16) **Basic Facts Regarding Tlingit (Leer 1991)**

- Highly endangered Na-Dene language spoken in Alaska, British Columbia, Yukon



- *Like relatives in Athabaskan family, has largely prefixal verbal morphology.*
- *Prefix order is complex, and is usually described via a 'position-class' template containing up to 22 different 'slots'* (see Appendix 1)
- *Tlingit data are written using the 'e-mail orthography'* (Crippen 2009)

(17) **Notations for Describing Discontinuous TAM-Inflections in Tlingit**

a. If two morphs are adjacent, then "+" is written between them.
b. If two morphs are not necessarily adjacent, then "…" is written between them.
c. If there exist two homophonous morphs, they are distinguished using subscripts
d. 'CONJ' = conjugation marker for the V; identity depends upon V-class

(18) **The Form of Future-Tense Verbs in Tlingit (Leer 1991: 208, 381, 507)**

CONJ … ga_1 + u_1 + gha_1 … ROOT + (μ, H)

- The 'position 8d' conjugation marker for the verb
- The 'position 4d' prefix ga_1
- The 'position 4c' prefix u_1
- The 'position 4a' prefix gha_1
- The root
- A suffix consisting of a floating mora and a floating H-tone
  (These either attach to the vowel in the root, or delete).

(19) **Illustration**

Yei ikkhwasatéen.
yei – *i* – ***ga*$_1$ – *u*$_1$ – *gha*$_1$** – *xha – satin* - **(μ, H)**
CONJ – 2sgO - ***ga*$_1$ – *u*$_1$ – *gha*$_1$** – 1sgS – see - **(μ, H)**
I will see you.

(20) **Claims to be Defended**

a. None of the prefixes in (18) are individually an exponent of the feature '[FUT]'
b. *Most of the prefixes in (18) don't have an identifiable syntactic or semantic value.*

3.1 The Position 8b Conjugation Marker

As suggested by the label 'conjugation marker', this prefix shows up in a number of other forms besides the future.

The other forms this 'conjugation marker' appears in don't obviously share any syntactic/semantic properties in common with the future forms (or with each other).

(21) **Illustration: Iterative Imperfective Forms**

a. <u>The Iterative Imperfective Form of a Verb (Leer 1991: 246)</u>

CONJ … ROOT + ch_1
- The 'position 8d' conjugation marker for the verb
- The suffix -ch_1

b. <u>Illustration (Leer 1991: 246)</u>

Kei khuk'éich
kei - *khu -* *k'éi -* ***ch₁***
CONJ - *weather - good -* ***ch₁***
The weather (always) turns good.

3.2 The Position 4d Prefix ga_1

Interestingly, other than its appearance in future forms, the 'position 4d ga_1' functions as a *conjugation marker* (Leer 1991: 107-112).[1]

The various other forms that this conjugation marker appears in don't obviously share any syntactic/semantic properties in common with future forms (or each other).

(22) **Illustration: Some Other Verb Forms Containing ga_1 (Leer 1991: 255)**

a. <u>Imperative</u>	b. <u>Habitual</u>	c. <u>(Past) Conditional</u>
igak'éi	gak'éich	gak'éi
*i-**ga₁**-k'éi*	***ga₁**-k'éi-**ch₂***	***ga₁**-k'éi-**(μ, H)***
2sO-**CONJ**-*good*	**CONJ**-*good-**ch₂***	**CONJ**-*good-**(μ, H)***
Be good.	*It's always good.*	*When it was good.*

[1] There are two places where conjugation class can be marked in a Tlingit verb, an 'inner position' (position 4) and an 'outer position' (position 8). Which position a particular verb form uses depends (unpredictably) upon the particular TAM morphology in the verb.

3.3 The Position 4c Prefix u_1

Other than its appearance in future forms, this prefix appears in the so-called 'comparative form' of stative Vs (Leer 1991: 110)

The 'comparative form' is used when a stative V (*e.g.* 'big') is being modified by any kind of degree modifier (*e.g.* 'more than NP', 'less than NP', 'as NP', 'so')

(23) **The Comparative Form of a Stative Verb (Leer 1991: 110)**

Degree-Modifier ... *ka* + u_1 … ROOT

- The preverbal degree-modifier phrase
- The 'position 5a' prefix *ka*
- The 'position 4c' prefix u_1
- The root

(24) **Illustration (Leer 1991: 260)**

Yéi kwsikáak
yéi ***ka - u₁*** *- sikáak*
thus/so ***ka - u₁*** *- thick*
It is that/so/thus thick.

Side-Notes:

- Given that it is limited to (i) future forms, and (ii) comparative forms, the prefix u_1 doesn't seem to be the individual realization of any identifiable syntactic feature.

- The position 5a prefix *ka* in (23) also has a distribution that would preclude assigning it any uniform syntactic/semantic value (Leer 1991: 112)

3.4 The Position 4a Prefix gha_1

Other than its appearance in future forms, it also appears in a variety of other TAM inflections (the set of which do not seem to form a natural syntactic/semantic class):

- It appears in the so-called 'potential' forms of Vs

- It appears in the so-called 'hortative' forms of Vs

(25) **The Potential Form of a Verb (Leer 1991: 508)**

CONJ … u_2 … gha_1 … *ya* + ROOT + μ

- The 'position 4' conjugation marker
- The 'position 4c' prefix u_2
- The 'position 4a' prefix gha_1
- The 'position 1a' prefix *ya*
- The root
- A suffix consisting of a floating mora
  (which either attaches to the vowel in the root, or deletes).

(26) **Illustration of Potential Form (Leer 1991: 223)**

Khwaaxhaa
∅ - ***u_2*** - ***gha_1*** - *xha* - ***ya*** - *xha* - $\boldsymbol{\mu}$
CONJ - ***u_2*** - ***gha_1*** - 1sgS - ***ya*** - *eat* - $\boldsymbol{\mu}$
I might eat it.

(27) **The Hortative Form of a Verb (Leer 1991: 509)**

CONJ … gha_1 … ROOT + μ

- The 'position 4' conjugation marker
- The 'position 4a' prefix gha_1
- The root
- A suffix consisting of a floating mora

(28) **Illustration of Hortative Form (Leer 1991: 225)**

Khaxhaa!
∅ - ***gha_1*** - *xha* - *xha* - $\boldsymbol{\mu}$
CONJ - ***gha_1*** - 1sgS - *eat* - $\boldsymbol{\mu}$
Let me eat it!

<u>Side-Notes:</u>

- Given its appearance in (i) the future forms, (ii) the potential forms, and (iii) the hortative forms, it is clear that gha_1 is not an exponent of the primitive feature [FUT].

- Moreover, given its distribution, it is hard to assign any specific syntactic/semantic value to gha_1

- These same points can be made for the other affixes appearing in the 'potential' and 'hortative' forms above.

3.5 The Suffix '-(μ, H)'

Other than its appearance in future forms, it also appears in a variety of other TAM inflections, none of which form a natural syntactic/semantic class with the future

- It appears in the (past) 'conditional' forms of Vs (*e.g.* (22c))
- It appears in the so-called 'admonitive' forms of Vs
- It appears in the so-called 'realizational' forms of Vs

(29) **The Admonitive Form of a Verb (Leer 1991: 510)**

CONJ … u_2 … ROOT + (μ, H)

- The 'position 4' conjugation marker
- The 'position 4c' prefix u_2
- The root
- A suffix consisting of a floating mora and a floating H-tone
  (These either attach to the vowel in the root, or delete).

(30) **Illustration of Admonitive Form (Leer 1991: 225)**

Xhwaxháa
∅ - ***u_2*** - *xha* - *xha* - **(μ, H)**
CONJ - ***u_2*** -1sgS - *eat* - **(μ, H)**
Let me not eat it!

(31) **The Realizational Form of a Verb (Leer 1991: 508)**

CONJ … *ya* + ROOT + (μ, H)

- The 'position 4' conjugation marker
- The 'position 1a' prefix *ya*
- The root
- A suffix consisting of a floating mora and a floating H-tone
  (These either attach to the vowel in the root, or delete).

(32) **Illustration of the Realizational Form (Leer 1991: 223)**

Xhwaaxháa
∅ - *xha* - ***ya*** - *xha* - **(μ, H)**
CONJ - 1sgS - ***ya*** - *eat* - **(μ, H)**
I finally ate it. (Or 'I have eaten it'; Leer (1991: 378-381))

(33) **Interim Summary**

- The future forms of a Tlingit verb are composed of 5 (often non-contiguous) affixes.
- None of these affixes is individually a realization of the syntactic feature '[FUT]'
- None of these affixes seems as if it is individually the realization of *any* identifiable inflectional (TAM) feature
- **This general property holds not only for future forms, but for many other TAM forms of Tlingit verbs**
    - **Iterative imperfective (21)**
    - **(Past) conditional (22c)**
    - **Comparative (23)**
    - **Potential (25)**
    - **Hortative (27)**
    - **Admonitive (29)**
    - **Realizational (31)**
    - **Perfective (*to be discussed…*)**

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4. Radically Discontinuous Exponence in the Athabaskan Languages

(34) **Some Very Basic Facts Regarding the Athabaskan Languages**

- Second largest language family in North America; approx. 46 languages spoken from Northern Alaska to Arizona.
- *Prefix order is complex, and is usually described via a 'position-class' template very similar to the one found in Tlingit* (see Appendix 2)
- *Though individual languages are often not mutually intelligible, the forms of their individual TAM inflections are highly congruent* (Leer 1979).
- For concreteness, I will illustrate the Athabaskan system using forms from Koyukon (Axelrod 1993). To my knowledge, the relevant facts hold across the family.

(35) **The Form of Future Tense Verbs in Koyukon (Axelrod 1993: 40)**

te … *ghe* ... ROOT + SUFFIX

- The 'position 4c' prefix *te*
- The 'position 3b' prefix *ghe*
- A suffix (whose exact identity depends upon other inflectional properties of the verb)

(36) **Illustration (Axelrod 1993: 41)**

Tolhkon'
te - ***ghe*** - *lhkon* - ***'***
te - ***ghe*** - *rain* - **SUFFIX** [2]
It will rain.

Side-Note:
This general structure for 'future' is cognate across the family. The main differences that do appear include:

a. The actual phonetic forms of the 4c and 3b prefixes (*e.g.* in Navajo, they are *di* and *yi*, respectively)

b. In some languages the suffix has fused with the root to form a portmanteau. Thus, in these languages, it is more proper to speak of a 'future stem variant' than a 'future suffix'.

(37) **Claims to be Defended**

a. None of the prefixes in (35) are individually an exponent of the feature '[FUT]'

b. *None of the prefixes in (35) have an identifiable syntactic or semantic value.*

4.1 The Position 4c Prefix *te*

Other than its appearance in future forms, this prefix also appears in the so-called 'inceptive form' of the verb, which is used to 'refer to the inception of an activity, event or state' (Axelrod 1993: 106).

(38) **The Inceptive Form of a Verb (Axelrod 1993: 106)**

te … *le* … ROOT + SUFFIX

- The 'position 4c' prefix *te*
- The 'position 3c' prefix *le*
- A suffix (whose exact identity depends upon other inflectional properties of the verb)

(39) **Illustration (Axelrod 1993: 106)**

Taatlkon'
te - ***le*** - *lhkon* - ***'***
te - ***le*** - *rain* – **SUFFIX** [3]
It started to rain.

Side-Note: The 'inceptive form' in (38) is cognate across the Athabaskan family, as well as its morpho-phonological relationship to the future form.

[2] The suffix -*'* is used here because the verb is in the so-called 'durative aspect' (Axelrod 1993: 62-66).
[3] As in example (36), the suffix -*'* is used here because the verb is in the so-called 'durative aspect'.

4.2 The Position 3b Prefix *ghe*

Other than its appearance in future forms, this prefix also appears in the so-called 'progressive form' of the verb, where it is used to 'refer to an activity which is kept on particularly while one is moving along' (Axelrod 1993: 100)

(40) **The Progressive Form of a Verb (Axelrod 1993: 99)**

ghe … ROOT + *lh*

- The 'position 3b' prefix *ghe*
- A suffix, specific to the progressive, which is of the form -*lh*

(41) **Illustration (Axelrod 1993: 100)** Ghets'oohtl
ghe - *ts'ooh* - ***lh***
ghe - *scream* - ***lh***
He/she/it is going along squealing.

<u>Side-Note:</u> The 'progressive form' in (40) is cognate across the Athabaskan family, as well as its morpho-phonological relationship to the future form.

4.3 The Suffix Used in Future Forms

Besides its appearance in the 'future form' the 'future tense suffix' often appears in other forms as well…

… in order to show this, however, we will first need to explain a bit more about how the form of the 'future suffix' is chosen…

(42) **Basic Fact**

The exact suffix that a given 'future form' uses depends upon a second inflectional dimension of the verb, a dimension Athabaskanists refer to as 'aspect'.

(42) **The Aspects of Koyukon (Axelrod 1993: 20)**

a.	Neuter	i.	Consecutive
b.	Transitional	j.	Repetitive
c.	Momentaneous	k.	Directive
d.	Perambulative	l.	Semelfactive
e.	Continuative	m.	Bisective
f.	Persistive	n.	Conclusive
g.	Reversative	o.	Onomatopoetic
h.	Durative		

(43) **Dependence of Suffix Choice on Aspect**

- Any verbal form in Koyukon must be in one of the above 15 'aspects'
- Which aspect the verbal form is in affects the realization of the future suffix.
- (The two above facts generally hold across the Athabaskan family.)

(44) **Just a Few Future Suffixes of Koyukon (Axelrod 1993)**

a. Transitional Future Suffix: *-h*

b. Momentaneous Future Suffix: *-lh*

c. Perambulative Future Suffix: *-k*

d. Durative Future Suffix: *-'*

(45) **Key Fact: Suffix Used in Future Often Appears in Other TAM Forms**

a. Transititional **Imperfective** Suffix: *-h* (*cf.* (44a))

b. Momentaneous **Optative** Suffix: *-lh* (*cf.* (44b))

c. Perambulative **Optative** Suffix: *-k* (*cf.* (44c))

d. Durative **Perfective** Suffix: *-'* (*cf.* (44d))

(46) **Interim Summary**

- The future forms of an Athabaskan verb are composed of 3 (non-contiguous) affixes.
- None of these affixes is individually a realization of the syntactic feature '[FUT]'
- None of these affixes seems as if it is individually the realization of *any* identifiable inflectional (TAM) feature
- **This general property holds not only for future forms, but for many other TAM forms of Athabaskan verbs (though we only considered two here):**
    - **Inceptive (38)**
    - **Progressive (40)**
    - **Perfective (*to be discussed…*)**

5. Summary: The TAM System of Na-Dene Languages

(47) **A 'Vision' Which Naturally Emerges**

a. There is a finite (but large) pool of primitive morpho-phonological 'pieces':
   - affixes, each assigned a particular, arbitrary position class

b. Each of these morpho-phonological 'pieces' is individually meaningless

c. Particular inflectional features can be realized as some conventionalized combination of these (individually meaningless) affixes.

(48) **A 'Vision' With the Force of Tradition**

This trait of split semantemes, of ***making the expression of an idea depend upon a binary compound that is readily interrupted by the expression of auxiliary ideas****, or by some of the interrupted parts of auxiliary expressions… is the outstanding peculiarity of Athabascan…*

…Athabascan languages present the appearance of intricate and highly patterned combinations ***of small elements having independent and discernable meanings, <u>but largely used in formula-like combinations</u>****…* (Whorf 1932: 17-19, *emphasis mine*)

(49) **A Concrete Model (for Tlingit) in Line with This Vision [Based on Kari 1989, 1992]**

a. <u>Autonomous Morphological Categories (Aronoff 1994)</u>

[GA_1] ; [U_1] ; [GHA_1] ; [MORA-TONE]

b. <u>Na-Dene TAM Morphology is 'Morphology-by-Itself' (Aronoff 1994)</u>

(i) *'Realization Rules' for Inflectional Features*

$V_{[FUT]}$ → [GA_1] ; [U_1] ; [GHA_1] ; [MORA-TONE] ; V
$V_{[1sgS]}$ → [1sgS] ; V

(ii) *Illustration:*
$V_{[1sgS\ ;\ FUT]}$ → [GA_1] ; [U_1] ; [GHA_1] ; [MORA-TONE] ; [1sgS] ; V

c. <u>Morphological Template Orders the (Autonomous) Morphemes</u>

… [GA_1] > [U_1] > [GHA_1] > [1sgS] > V > [MORA-TONE] …

d. <u>Spell-Out and Phonology</u>

(i)	Output of Morph.	[GA_1]-[U_1]-[GHA_1]-[1sgS]-V-[MORA-TONE]
(ii)	Spell-Out:	*ga u gha xha xha* (μ, H)
(iii)	Phonology:	/ kukhwaxháa / 'I will eat it'

(50) **The Challenge This Vision Poses**

As a model of inflectional morphology, the picture sketched in (47)-(49) is clearly at odds with a 'syntacto-centric' model.[4]

<u>The Main Issue:</u>
There are morpho-syntactic categories (the affixes) which are entirely autonomous to morphology, and do not correspond to any syntactic categories/features (Aronoff 1994)

> Thus, morpho-syntactic structure does not seem to be the result of a pure 'transformation' of syntactic structure above the level of the word…

(51) **Question**
But aren't there well-known models of Na-Dene (Athabaskan) morphology which *are* 'syntacto-centric'?

(52) **Answer**
Yes! Such works include: Speas (1984, 1990, 1991), Rice (2000), Hale (2001)

<u>However:</u>
- These works are aimed at a rather different, and equally difficult problem: *explaining the **order** of the prefixes, and thus eliminating the need for the 'template'*
- *Thus, these works largely (and rightly) abstract away from the problems posed by the distributed exponence in the TAM systems of these languages.*

(53) **The Puzzle of Prefix Order in Na-Dene**

a. <u>Another Key Consequence of (2)</u>
It should be possible to derive the relative order of various 'position classes' from the hierarchical position of their related syntactic heads.

b. <u>The Challenge of Prefix Order in Na-Dene</u>
Even for those prefixes that seem to have an identifiable syntactic/semantic value, their ordering seems, at first glance, to be 'chaotic' (see Appendices)…
…indeed, that's why the template was developed as a descriptive device!

c. <u>Approaches to the Puzzle</u>
- (Some of) the prefixes are actually *infixes*, which upsets a more principled underlying order (Speas 1984, 1990; Hale 2001).

- The prefix order is principled, if you assume that (somehow) prefixes closer to the verb *c-command* prefixes further from the verb (Speas 1991, Rice 2000)

[4] Moreover, note that (47)-(49) is also at odds with other, *non*-syntacto-centric models of morphology, including Anderson (1992) and Steele (1995).

6. The Na-Dene TAM System from a 'Syntacto-Centric' Perspective

(54) **Key Question**

- How can a syntacto-centric model of morphology even handle the facts in (18)-(46)?
- (To simplify disucssion, I will restrict my attention to Tlingit future morphology (18))

(55) **Idea 1: Massive Homophony and Multiple Exponence**

a. <u>The Core Idea:</u>

- Maybe we're just wrong that the *ga/u/gha* which appear in Tlingit future forms are the *same ga/u/gha* as appear in other verb forms?

- And, maybe the *ga/u/gha* specific to future forms are *each individually* a realization of [FUT]?

b. <u>Analysis Sketch</u>

(i) Spell-Out Rules:

[FUT] → *gha*
[FUT] → *u* / ___ *gha*
[FUT] → *ga* / ___ *u*

(ii) Some kind of 'magic' allows a structure where the single syntactic head [FUT] is spelled out three times in the Tlingit verb:

[AgrO]-**[FUT]-[FUT]-[FUT]**-[AgrS]-V

(56) **Problem for 'Idea 1': The Extent of Homophony**

Positing the additional prefixes in (55b) doesn't on its own create an undue amount of homophony (see (57) below)…

…However, if we pursue 'Idea 1' as a general strategy, then we *will* end up creating a rather massive (and suspicious) amount of homophony (57)…

(57) **Tlingit Template After Adding New Prefixes for 'Future' and 'Potential' (*see* (25))**

…	<u>Position 4d</u>	<u>Position 4c</u>	…	<u>Position 4a</u>	…	<u>Position 1a</u> …
	ga_1	u_1		*wu*		*ya*
	$\boldsymbol{ga_{FUT}}$	u_2		gha_1		$\boldsymbol{ya_{POT}}$
		u_3		$\boldsymbol{gha_{FUT}}$		
		$\boldsymbol{u_{FUT}}$		$\boldsymbol{gha_{POT}}$		
		$\boldsymbol{u_{POT}}$				

(58) **Idea 2: No Morpho-Syntax, Only Morpho-Phonology**

a. <u>The Core Idea:</u>

- Maybe we're just wrong that there is any morpho-syntax at all in the Tlingit (Na-Dene) verb…
- Maybe the grammar states that [FUT] is realized via a set of *syllables*, and the phonology then orders those syllables in the word.

b. <u>Analysis Sketch</u>

(i) Spell-Out Rules: [FUT] → { /*ga*/ , /*u*/ , /*gha*/ }

(ii) 'Purely Phonological' Ordering Rules: /*ga*/ > /*u*/ > /*gha*/

(59) **An Advantage of 'Idea 2'**

The 'purely phonological' ordering rules it must appeal to would seem to capture a widely-noted property of Na-Dene prefix order:

<u>Principle of 'Templatic Attraction' (Leer 1991)</u>
Homophonous prefixes tend to occupy linearly adjacent positions in the prefix string.

(60) **Problems for 'Idea 2': Deriving the Ordering and the Semblance of Morpho-Syntax**

a. It doesn't look like there is a principled way (in Tlingit) of deriving the order of prefixes from their *phonological* properties alone…
… so it looks like we lose any principled account of prefix order…

b. <u>The Ordering Rules Just *Can't* Be *Purely* Phonological!</u>

- The principle of 'templatic attraction' is only a *tendency*.
- There are many homophonous prefixes which are ordered differently with respect to other prefixes

Example: While /*u*/ precedes 'position 1a' /*ya*/, it follows 'position 5b' /*ya*/

c. <u>The Appearance of Recurring 'Morphs'</u>

If we appeal to the purely phonological realization rules in (58bi), there is no reason to expect that different TAM inflections should be made of the same 'phonological pieces'…
… but they *are*...

6.1 Na-Dene TAM Morphology is Not Inflectional

In this last section of the talk, I will develop and discuss a third, possibly more viable way of analyzing the Na-Dene TAM system within a 'syntacto-centric' model of morphology…

(61) **Crucial Background Fact**

- In Na-Dene languages, this kind of discontinuous exponence is not just a feature of the TAM system…
- *However, its appearance elsewhere is not as problematic for syntacto-centric models*

(62) **Discontinuous Exponence in Na-Dene Lexical Items**

- Particular lexical items in Na-Dene languages usually do not consist of a root alone.
- Rather, they consist of a semantically light/empty root, in combination with a number of (non-contiguous) semantically light/empty prefixes, which together have a conventionalized meaning.

a.	Example from Tlingit (Leer 1991: 125)	*ka…sh+d…xit*	'to write'
		ka**xha**shxeet	'I am writing it'
		ka**xhw**jixeet	'I wrote it'
b.	Example from Slave (Rice 2000: 12)	*n…ji*	'to be afraid'
		n**eh**ji	'I am afraid'

(63) **Discontinuous Exponence in Na-Dene Derivational Morphology**

- Particular 'derivational morphemes' in Na-Dene languages usually do not consist of a single affix.
- Rather, they consist of a sequence of (non-contiguous) semantically light/empty affixes, the combination of which has a particular conventionalized meaning.

a. Example from Tlingit (Leer 1991: 99)

(i)	*ash … ka+u_2 … l+d* …ROOT + *aa*	'to play at V-ing'
(ii)	***ash kool**xeed**aa***	'S/he is playing at writing'

b. Example from Koyukon (Axelrod 1993: 85-86)

(i)	*do…de*…ROOT	'to V in a pile'
(ii)	***do**ye**daa**neelhk'elh*	'S/he tore it up into a pile'

(64) **Observation**

Because it doesn't involve *inflectional* morphology, the discontinuous exponence in (62) and (63) doesn't pose *as difficult* a problem for syntacto-centric models …

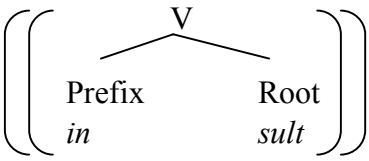
(65) **Syntacto-Centric Model of (62)**

First, it's actually quite common across languages for a lexical item to consist of a bound root and affix(es), whose combined meaning is idiosyncratic.

a. <u>Examples from English:</u> in-sult, re-sult, con-sult

These facts can be captured via lexical entries like the following (also useful for phrasal idioms):

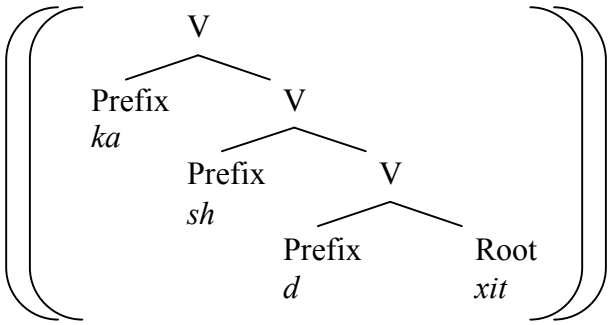
b. <u>Lexical Entries for (65a)</u>



= [λx : [λy : y insults x]]

Modulo issues of affix ordering (which I will put aside), such lexical entries could also be composed for the Na-Dene verbal forms in (62).

c. <u>Lexical Entries for (62)</u>



= [λx : [λy : y writes x]]

<u>Side-Note</u>

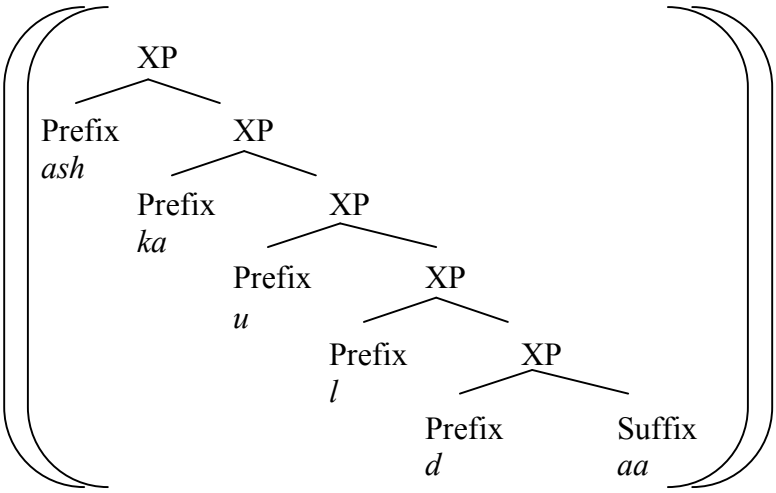
- There is certainly still a puzzle concerning the *surface position* of the prefixes in (62), particularly their ability to separated from each other by other (inflectional) prefixes.
- **But, we don't face the more acute problem of having to relate a *single*, <u>primitive</u> syntactic feature (*e.g.* '[FUT]') to *multiple*, individually meaningless morphs.**

(66) **Syntacto-Centric Model of (63)**

- The approach outlined above would also seem to work for the discontinuous exponence seen in Na-Dene derivational morphology.

- Again, *modulo issues concerning the surface order of the prefixes*, one could certainly appeal to lexical entries that appeared as follows:

a. <u>Lexical Entry for (63a)</u>



$= \quad [\ \lambda f_{<et>} : [\ \lambda x\text{: x 'plays at' f}\ ]\ ]$

<u>Side-Note</u>

- Again, there remains the serious problem of having to relate this syntactic structure in (66a) to the surface order of affixes in (63a)…

- However, crucially, we don't run into the problem of having to relate *complex morpho-syntax* to a single, *primitive syntactic head/feature*

- Rather, we can relate the complex morpho-syntax to a complex syntactic structure…

These considerations suggest the following idea…

(67) **The Key Idea: TAM in Na-Dene is *Not* 'Inflectional'**

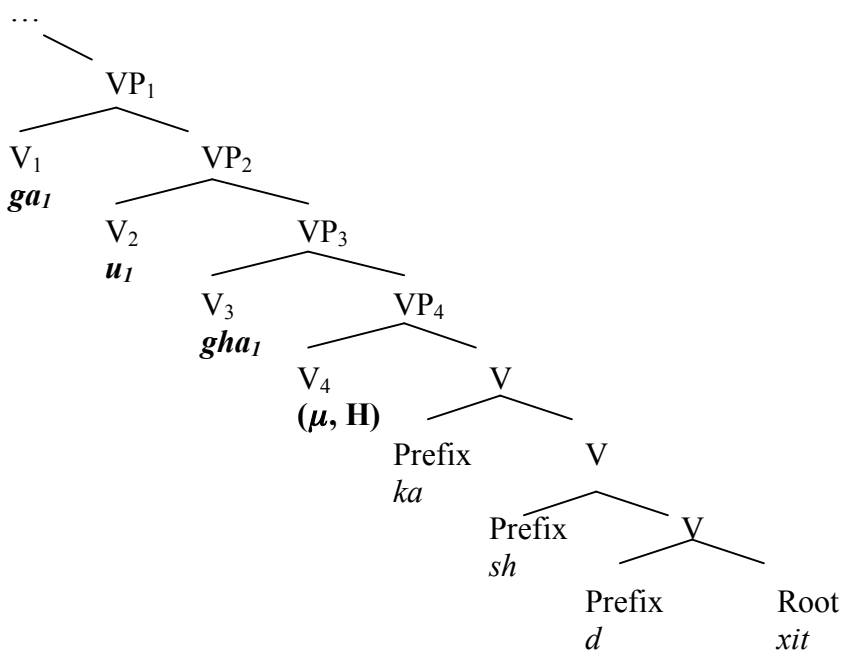
- Suppose that the TAM categories in Na-Dene languages are not primitive inflectional features (such as '[FUT]')

- Rather, suppose that they have a nature and structure more akin to the 'derivational prefix strings' in (63) and (66)…

(68) **Analysis Sketch for Tlingit Future**

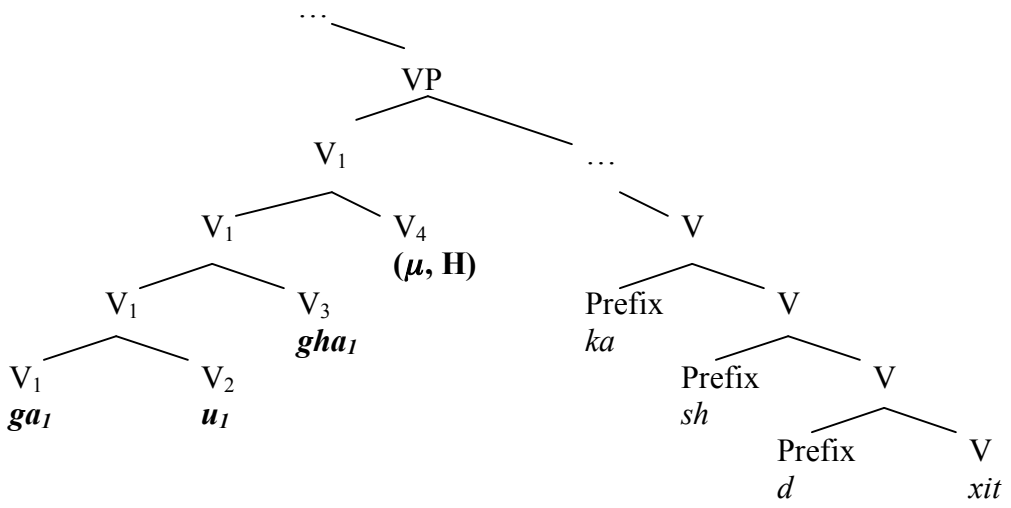
a. <u>The Underlying Clausal Syntax of a Tlingit Future Form</u>

The main verb is dominated by a series of 'light verbs'



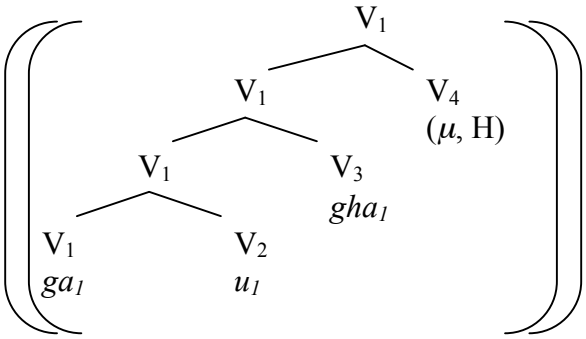
b. <u>The Structure at LF</u>

Prior to semantic interpretation, the 'light verbs' come together via H-movement to form a phrasal unit.



<u>Side-Note:</u>
The structure in (68b) cannot be the pronounced (PF) structure of the sentence.

c. <u>Lexical Entry for Derived Complex Head</u>



= [$\lambda p_{<it>}$: *there is some time t' in the future such that* p(*t'*) = T]

(69) **Key Features of the Analysis**

- The syntactic representation of a TAM category is *not* as a primitive 'feature' born by some functional head (*e.g.* a T-head bearing '[FUT]')
- Rather, these categories correspond syntactically to a series of semantically 'light' lexical heads ('V', for lack of a better idea).
- Though each lexical head has basically no meaning on its own, combinations can be stipulated to have certain conventionalized meanings via entries like (68c).

Now, this is perhaps not too 'shocking' a proposal for TAM categories like 'future', which in many languages are realized via verbal auxiliaries (e.g. English)…

...but such an analysis would also have to hold for such TAM categories as 'perfective'!

(70) **Radically Discontinuous Exponence in Na-Dene Perfective Forms**

a. <u>Tlingit Perfective Forms (Leer 1991: 507)</u>

wu … *ya* + ROOT + *μ*

- Position 4a prefix *wu*
- Position 1a prefix *ya*
- Floating mora suffix

b. <u>Koyukon Perfective Forms (Axelrod 1993: 34)</u>

CONJ … *ne* … ROOT + SUFFIX

- Position 3 conjugation marker
- Position 3a prefix *ne*
- Suffix, whose form depends upon the 'aspect' of the V

(71) **Conclusion (for Syntacto-Centric Models)**

- Tense-Aspect-Mood morphology in Na-Dene languages (including such categories as 'perfective') is not *inflectional* morphology.
- That is, this morphology is not the realization of primitive, inflectional features born by functional heads in the clause (such as 'FUT' or 'PERF')
- Rather, it is 'derivational', in the sense that it is the realization of semantically 'light' lexical heads…
- Interestingly, combinations of these 'light' lexical heads happen to be (idiosyncratically) assigned a TAM-meaning…

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7. Problems and Questions

(72) **An Argument that TAM Morphology in Na-Dene *is* Inflectional**

- A cornerstone property of 'inflectional features' is that a particular lexical item cannot appear in a sentence without being specified for *some* value of that feature.
- In Na-Dene languages, a given verbal form has to appear in *some* TAM form.
  That is, it must be either *future, perfective, imperfective, optative*...
- The proposed model, however, suggests that it should be possible for Na-Dene sentences to contain Vs that are not specified for TAM…
- For example, it predicts that the Tlingit lexical item *ka-sh-xit* 'to write' could surface in a sentence *on its own*, without being dominated by any 'TAM light Vs'

(73) **Observation 1: Imperfective Forms are Morphologically Simple**

Across Na-Dene languages, the most morphologically simple TAM form is the imperfective.

a. <u>Tlingit Imperfectives (Leer 1991: 507)</u>
ROOT + SUFFIX
The identity of the suffix depends upon (i) the root, and (ii) certain derivational morphemes in the verbal form.

b. <u>Koyukon Imperfective (Axelrod 1993: 19)</u>
CONJ … ROOT + SUFFIX
- Position 3 conjugation marker
- Suffix, whose form depends upon the 'aspect' of the V

(74) **Observation 2: Imperfective Forms are (Essentially) Bare Forms**

What morphemes do exist in imperfective forms are determined by features *other* than the imperfective aspect *per se*

a. The suffix in Tlingit imperfectives is determined by the identity of the root, and the existence of any other 'derivational' morphemes in the verb form.

b. The suffix in Athabaskan imperfectives is determined by the 'aspect' that the verb is in (see Section 4.3)

Consequently, one could take the view that *there is no specifically imperfective morphology* in Na-Dene languages.

(75) **Proposal: Imperfective Forms *are* the Bare Forms of Vs**

a. Verbal lexical items in Na-Dene languages are inherently 'imperfective' in their meaning.

b. As predicted by the model in Section 6.1, it *is* possible for verbal forms to surface in a sentence without any 'TAM light verbs'

c. When this occurs, what surfaces is a TAM-bare form of the verb, which (due to (75a)) has an imperfective meaning.

(76) **Another Important Question: Why Not a Compositional Semantics?**

Why not propose a syntacto-centric model where the syntax of the TAM categories in Na-Dene is complex, but possesses a principled, compositional semantics?

(77) **Some Thoughts in Response**

- A compositional semantics for Tlingit future morphology just doesn't seem possible (ask yourself: 'what is the meaning of u_1 such that it is a crucial component of the future and the comparative, but not the potential?')

- A compositional semantics would still grant the point that syntacto-centric approaches must view these TAM categories as corresponding to a complex syntax (*i.e.*, 'perfective' is not just some primitive feature on an ASP head…)

- Even if a compositional semantics were possible, it's doubtful that the individual morphs would correspond to any recognizable *functional syntactic head* (and so such a system would still the view the individual morphs as some kind of semantically light lexical heads…)

(78) **Questions Raised by the System**

If this is on the right track, then there are no TAM 'features' in the syntactic representations of Na-Dene sentences…

a. Question: *How certain are we that there are such 'features' in any languages?*

Well, one reason we believe in features like [1sg], [MASC], and [DEF] is because of 'feature sharing' phenomena like agreement and concord…

b. Follow-Up Question: *So, are there things like TAM-Agreement or TAM-concord?*

(See Cable (2008) for an analysis of English sequence-of-tense that treats it as a *semantic*, not morpho-syntactic phenomenon)

(79) **The Overall Message**

- If it does exist, then 'radically discontinuous exponence' (RDE) poses a strong challenge to syntacto-centric models of morphology.

- The phenomenon does seem to exist in the TAM-systems of Na-Dene languages.

- We can explain away the RDE in Na-Dene languages *if* we assume that their TAM categories are not properly inflectional…
  … that is, if their syntactic representation is not as a feature on some functional head, but rather as a sequence of light lexical elements…

- Such an analysis is not wholly implausible for the TAM systems of Na-Dene languages…
  … but it does raise questions for our more general theory of how TAM categories are syntactically represented…

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Appendix 1: Tlingit Verbal Prefix Template (Leer 1991: 147-149)

Position 8: Proclitics; many have a 'directional' meaning

Position 8f:	*ghunayéi, gági, dáaghi, ...*
Position 8e:	*yan, yaxh, neilxh, haat, yóot, khuxh, khut, …*
Position 8d:	*kei, yei, yeekh, daakh, daak, ...*
Position 8c:	*yéi*
Position 8b:	yaa_1
Position 8a:	yaa_2, *yoo*

Position 7:

Position 7b:	*daxh*	(distributive) ;	*woosh*	(reciprocal)
Position 7a:	*has*	(plural subject or object)		

Position 6: Object Markers [5] *xhat* (1sgO), *i* (2sgO), *haa* (1plO), *yee* (2plO), …

Position 5: Incorporated Inalienably Possessed Ns (and other stuff)

Position 5c:	Incorporated inalienably possessed Ns	
Position 5b:	*ya*	(individually meaningless prefix)
Position 5a:	*ka*	(individually meaningless prefix)

Position 4: Prefixes Related To Tense-Aspect-Mood

Position 4e:	ga_2	
Position 4d:	ga_1	(conjugation/future marker)
Position 4c:	u_1 , u_2 , u_3	
Position 4b:	∅, gha_2, *na*	(conjugation markers)
Position 4a:	*wu*, gha_1	

Position 3: *dagha* (distributive)

Position 2: Subject Markers *xha* (1sgS), *ee* (2sgS), *too* (1plS), *yi* (2plS), …

Position 1: The 'Classifier Matrix'

Position 1c:	*l-, s-, sh-,* ∅
Position 1b:	*d-*
Position 1a:	*ya-*

Position 0: The Root

[5] If an alienably possessed N is incorporated, it appears in Position 6, and no object marker appears in the verb.

Appendix 2: Koyukon Verbal Prefix Template (Axelrod 1993: 15)

Position 10: Postpositional Objects

- Position 10b: *he*
- Position 10a: *be, ye, se, ne, k'e*, …

Position 9:

- Position 9b: *e, yee, ghu, aa, gho,* …
- Position 9a: *to, do, ts'e, yen*, …

Position 8: *no* (iterative)

Position 7: *ne* (distributive)

Position 6: Incorporated Nouns

Position 5: Object (and Some Subject) Markers

Position 5f:	Indefinite Object Markers	*be, he, k'e*
Position 5e:	Object Markers	*be, se, ne, ...*
Position 5d:	Indefinite Subject Marker	*k'e*
Position 5c:	Third Person Plural	*he*
Position 5b:	First Person Plural	*ts'*
Position 5a:	Third Person Singular Marker	*ye*

Position 4:

- Position 4f: *hu, he, o, ghe*
- Position 4e: *oo*
- Position 4d: *de*
- Position 4c: *te*
- Position 4b: *ne*
- Position 4a: *le*

Position 3: Prefixes Related To Tense-Aspect-Mood

Position 3d:	*ee, aa*	
Position 3c:	*le*	(conjugation marker)
Position 3b:	∅, *ne*, *ghe, ghu*	(conjugation markers and 'optative')
Position 3a:	*ne*	

Position 2: Some Subject Markers: *s, ne, uh*

Position 1: The 'Classifier' ∅, *lh, de, le*

Position 0: The Root