Kiowa Tonal Modification and the Prosodic Hierarchy

Taylor Miller
University of Delaware

January 7, 2017
Kiowa is an endangered language spoken in southwestern Oklahoma.

Three contrastive tones: H, L, F.

Phonologically- and morphologically-conditioned tonal modification has been documented (e.g. Watkins 1984, Harbour 2003, Adger et al. 2009).
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Watkins (1984): domain for tonal modification is "the word" (=grammatical word)

Question: Which prosodic constituent is relevant for Kiowa tonal modification?

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Outline

- Prosodic Hierarchy
- Relevant Kiowa Phonology
- Tone Lowering
  - Previous Accounts
  - The Phonological Phrase
- Tone Raising
  - Previous Accounts
  - The Composite Group
  - Compounds vs. Incorporation
- Summary and Discussion
Phonological domains layer and build according to size and character to form the Prosodic Hierarchy (c.f. Selkirk 1980, 1981a,b, 1986, Nespor & Vogel 1986, Beckman and Pierrehumbert 1986, Pierrehumbert and Beckman 1988)

\begin{itemize}
  \item Intonational Phrase (\(\nu\))
  \item Phonological Phrase (\(\varphi\))
  \item Prosodic Word (\(\omega\))
  \item Foot (\(\Sigma\))
  \item Syllable (\(\sigma\))
\end{itemize}
Prosodic Hierarchy

- Controversy surrounds the material between the $\omega$ and $\varphi$
- Recursive words (e.g. Selkirk 2011) vs. intermediate constituent (e.g. Vigário 2010, Vogel 2009, to appear)

$\int$ | $\psi$ | $\kappa$ | $\omega$ | $\Sigma$ | $\sigma$
Relevant Kiowa Phonology

### Vowels

<table>
<thead>
<tr>
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**Table:** Vowels (adapted from Watkins 1984)

- Vs may be underlyingly short or long, oral or nasal
- All vowels bear tone
- H-L-F Minimal Triplet
  - k’ó: ‘cold’
  - k’ő: ‘to lay there’
  - k’ọ: ‘knife; cut’
- Tone lowering and raising reported (e.g. Watkins 1984, Harbour 2003, Adger et al. 2009)
- Watkins proposes the domain for tonal modification to be “the word”
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Tone Lowering (Watkins 1984)
High tones (H) are lowered to (L) following a falling tone (HL)

\[ [+H] \rightarrow [-H] / [+H][-H]C_0 \]

Non-Lowering Environment

\[ à \quad -pó: \quad -à \]
\[ [1sg] \quad -see \quad -come.PF \]

‘I came to see (you).’

Lowering Environment

\[ à \quad -sà \quad -pò: \quad -à \]
\[ [1sg] \quad -child \quad -see \quad -come.PF \]

‘I came to see the child.’
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Lowering applies in suffixed nouns, verbs (with and without incorporation) and compounds
Tone Lowering

- Lowering applies in **suffixed nouns**, verbs (with and without incorporation) and compounds

**Suffixed Nouns**

<table>
<thead>
<tr>
<th>Kiowa</th>
<th>Comanches</th>
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<tr>
<td>kój-gú ‘Kiowas’</td>
<td>kjâj-gù ‘Comanches’</td>
</tr>
<tr>
<td>pó:-dó ‘bugs’</td>
<td>sâ:-dò ‘children’</td>
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Tone Lowering

- Lowering applies in suffixed nouns, verbs (with and without incorporation) and compounds

### Verbs

'You(pl.) show me the book.'

à -sâ -pò: -â [1sg] -child -see -come.PF
'I came to see the child.'
Lowering applies in suffixed nouns, verbs (with and without incorporation) and compounds

Compounds (Watkins 1984:31)

 hôl + tó: → hôltò: ‘hospital (sick+house)’
pj: + êl + k’hì:dá → pj:êlk’hì:dà ‘Thanksgiving (eat+big+day)’
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- What prosodic constituent forms the domain for tone lowering?
Previous work on Kiowa (Miller 2015, in prep) shows that phonological words consist minimally of a root (c.f. Nespor & Vogel 1986, Kabak & Vogel 2001, Vogel 2008, etc.)

Tone Lowering spreading across compounds and incorporated verb complexes (multiple roots) suggests a higher level constituent.

Previous work on similar polysynthetic languages have argued the full verb/noun complex corresponds to a phonological phrase (e.g. Rice 1993, Russell 1999, Dyck 1994, 2009, Evans et al. 2008, Ross 2012)

Assuming the Kiowa verb also corresponds to the Phonological Phrase, is the PPh the domain for Tone Lowering?
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Assuming the Kiowa verb also corresponds to the Phonological Phrase, is the PPh the domain for Tone Lowering?
Phonological Phrase (informal definition): A lexical head, any non-recursive material, and optionally its complement within the XP

Tone Lowering applies across lexical heads (nouns, verbs, and compounds) consistent with the definition

Does the domain include the head’s complement?
Testing for the Phonological Phrase

- Phonological Phrase (informal definition): A lexical head, any non-recursive material, and optionally its complement within the XP.
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Phonological Phrase (informal definition): A lexical head, any non-recursive material, and optionally its complement within the XP tone lowering applies across lexical heads (nouns, verbs, and compounds) consistent with the definition.

Does the domain include the head’s complement?
Testing for the Phonological Phrase

- Verb Phrase forms the simplest test
- Kiowa demonstrates SOV word-order
- Prediction: if the object is included a F in the object NP will spread low tone into the verb complex.

Within V (lexical head only)

kút bági: -pò: -ʔ:  
’You(pl.) show me the book.’

Across NP-V boundary (complement to lexical head)

k’jähî: ø -dó:  
man [3sg] -be  
’He’s/It’s a man.’
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### Across NP-V boundary (complement to lexical head)

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**Within V (lexical head only)**

kút bágî: -pò: -q:
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```

**Across NP-V boundary (complement to lexical head)**

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Tone Lowering applies within the Phonological Phrase

Evidence that the complement may not be included in the Phonological Phrase in Kiowa

\[ \text{Intonational Phrase} (\iota) \]
\[ \text{Phonological Phrase} (\varphi) = \text{Tone Lowering} \]
\[ \text{Composite Group} (\kappa) \]
\[ \text{Prosodic Word} (\omega) \]
\[ \text{Foot} (\Sigma) \]
\[ \text{Syllable} (\sigma) \]
Morphologically-conditioned raising and lowering has been reported in Kiowa compounds (e.g. Watkins 1984, Harbour 2002, 2003).

Watkins proposes that each root is lexically specified as a Tone Lowering (TL) or Non-Tone Lowering (Non-TL) root.

**Tone Raising (Watkins 1984)**

Initial L is raised to H following a compounded non-tone lowering root.

\[
t^h\mathcal{O}: + \text{sà:né} \rightarrow t^h\mathcal{O}:sá:né \text{ ‘water moccasin (water + snake)’}
\]

\[
k’\mathcal{O}p + \mathcal{O}p^h\mathcal{O}l \rightarrow k’\mathcal{O}ps\mathcal{O}p^h\mathcal{O}l \text{ ‘mountain ogre (mountain + owl)’}
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\text{k’ōp} + \text{sòp}^\text{h}\text{ōl} & \rightarrow \text{k’ōpsòp}^\text{h}\text{ōl} \text{ ‘mountain ogre (mountain + owl)’}
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| Compound Raising | tʰʔʃ: + sà:né → tʰʔʃ:sáː:né ‘water moccasin (water + snake)’ | k’óp + sòpʰól → k’ópsópʰól ‘mountain ogre (mountain + owl)’ |
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**Compound Raising**

\[ t^h\acute{o} + s\grave{a}:n\acute{e} \rightarrow t^h\acute{o}s\acute{a}:n\acute{e} \text{ ‘water moccasin (water + snake)’} \]

\[ k’\acute{\text{o}}p + s\grave{\text{o}}p^h\acute{o}l \rightarrow k’\acute{\text{o}}ps\acute{\text{o}}p^h\acute{o}l \text{ ‘mountain ogre (mountain + owl)’} \]
Recall Watkins (1984): tonal modification applies at "the word"

- Tone Lowering evidence confirmed Watkins’ "word" = PPh
- Tone Raising also proposed to apply across incorporated elements in a verb complex (though incomplete examples)
- Question: Does Tone Raising apply within the verb complex/PPh, as well?
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Tone Raising and the Verb Complex

Compounds with Raising

\[ k^{h}i:só + dë:\rightarrow k^{h}i:sódë: \text{‘afternoon nap (afternoon + sleep)’} \]

\[ pí:\ + mòó:dëp \rightarrow pí:mòó:dëp \text{‘have trouble eating (eat + have.trouble)’} \]

Incorporated Compounds

<table>
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<tr>
<th>Jà [(2,3sg/agt):1sg/pat:pl/obj]</th>
<th>-pí: -mòó:dëp</th>
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<td>-food -have.trouble.IPFV</td>
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\[ dë -k^{h}i:só -dë:\text{-mà} \]

‘I took an afternoon nap.’

\[ jà -pí: -mòó:dëp \]

‘I’m having trouble eating.’

- Raising does not apply within the verb complex
Compounds with Raising

$k^h\text{i:s} + dë: \rightarrow k^h\text{i:s}dë: \text{‘afternoon nap (afternoon + sleep)’}$

$pj: + m\text{ò:}dëp \rightarrow pj:m\text{ò:}dëp \text{‘have trouble eating (eat + have.trouble)’}$

Incorporated Compounds

$dë \quad -k^h\text{i:s} \quad -dë: \quad -m\text{à}$

$[1\text{sg/agt:3pl/obj}] -\text{afternoon} -\text{sleep} -\text{IPFV}$

‘I took an afternoon nap.’

$jå \quad -pj: \quad -m\text{ò:}dëp$

$[(2,3\text{sg/agt}):1\text{sg/pat:pl/obj}] -\text{food} -\text{have.trouble.IPFW}$

‘I’m having trouble eating.’

Raising does not apply within the verb complex
Tone Raising and the Verb Complex

Compounds with Raising

\[ k^h\text{í}:s\text{ó} + d\text{é}: \rightarrow k^h\text{í}:s\text{ó}d\text{é}: \] ‘afternoon nap (afternoon + sleep)’

\[ p\text{í}: + m\text{ò}:d\text{è}p \rightarrow p\text{í}:m\text{ò}:d\text{è}p \] ‘have trouble eating (eat + have.trouble)’

Incorporated Compounds

\[ d\text{è} [1\text{sg/agt}:3\text{pl/obj}] -k^h\text{í}:s\text{ó} -d\text{é}: -m\text{à} \]
‘I took an afternoon nap.’

\[ j\text{á} [(2,3\text{sg/agt}):1\text{sg/pat:pl/obj}] -p\text{í}: -m\text{ò}:d\text{è}p \]
‘I’m having trouble eating.’

Raising does not apply within the verb complex
If not the PPh, then what?

- Tone Raising is a compound-specific process
- Applies across multiple roots so not within the Phonological Word
- If not the PW and not the PPh, then what?
- Compound-specific processes at an intermediate (or recursive) level (e.g. Vogel 2008, 2009, to appear, Kabak & Revithiadou 2009, Vigário 2010, Selkirk 2011)
- Recursion is ruled out, as the characteristic processes diverge from that of the Phonological Word.
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The Composite Group

- Tone Raising applies within the Composite Group

Intonational Phrase ($\iota$)

Phonological Phrase ($\varphi$) = Tone Lowering

Composite Group ($\kappa$) = Tone Raising

Prosodic Word ($\omega$)

Foot ($\Sigma$)

Syllable ($\sigma$)
Implications: Compounding vs. Incorporation

- Roots act differently in a compound vs. incorporation
- Confirms separate processes
- The exact nature of the difference is left to future research (Morphology vs. Syntax)
  - Mithun 1984 proposes four types of lexical incorporation
  - Snyder (2001) propose even compounding is syntactic but a MERGE operation instead of head-movement
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Watkins’ "word" domain corresponds to the PPh
- Tone Lowering applies within the PPh
- Tone Raising applies within the CG
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Tone Lowering applies within the PPh
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Tone Raising’s application within the CG but not within the PPh provides evidence that compounding and incorporation are separate processes within the grammar
Thank You!

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