Prosody in Endangered Languages: Case studies from Circassian and Muskogean

Matthew Gordon (in collaboration with others)

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Goals

- Describe prosodic systems of Kabardian (Circassian), Chickasaw (Muskogean), and Koasati (Muskogean)
- Situate these languages within the typology of prosodic systems ranging from stress to tone
- Examine relationship between word-level prosody and phrase-level prosody
Background

Koasati

- Spoken by about 250 speakers in two locations: Louisiana (200 speakers) and Texas (50 speakers)
- Virtually all fluent speakers are over 50 years old
- Work done in collaboration with Jack Martin and Linda Langley
- Focus on variety of Koasati spoken in Louisiana
Koasati speakers in Louisiana
Chickasaw

• Spoken by fewer than 120 speakers all over 55 in south-central Oklahoma (Chickasaw nation website: http://www.chickasaw.net/history_culture/index_644.htm)

• Much of the work done in collaboration with Pam Munro
Chickasaw speakers in Oklahoma
Kabardian

- Spoken by about 647,000 primarily in Russia and Turkey (15th edition of the *Ethnologue*, 2005)
- Focus on variety of Kabardian spoken in Turkey (200,000 speakers)
- Work done in collaboration with Ayla Applebaum
Kabardian speaking areas
Typology of prosodic systems

(1) Classic bi- and trifurcation of prosodic types

a. stress accent  tone

b. stress accent  tone  pitch accent

c. stress accent  *pitch accent  tone

• Hyman (2006) advocates bifurcation into stress accent and tone, since pitch accent is used as a dumping bin for lgs. with either a restricted set of tonal contrasts (e.g. Japanese, Somali, Western Basque) or both tone and stress (e.g. Swedish, Pirahã)
Crucial Trait of a Stress Lg.

• obligatoriness: every prosodic word has at least one syllable marked for the highest degree of metrical prominence
Crucial Trait of a Tone Lg.

• Pitch is associated with the lexical realization of certain morphemes or words
In practice, systems may be more or less prototypically stress or tone depending on their properties and lgs. may have both tone and stress.

Prototypical stress and tone characteristics

<table>
<thead>
<tr>
<th>Unit</th>
<th>Stress</th>
<th>Tone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culminative</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Rhythmic</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Weight-sensitive</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Demarcative</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Cues other than F0</td>
<td>✓</td>
<td>X</td>
</tr>
</tbody>
</table>
Kabardian, Chickasaw, and Koasati in the taxonomy of prosodic systems

- Kabardian: prototypical stress language in which each content word has a single stressed syllable
- Chickasaw: hybrid tone and stress language with predictable stress in addition to a subset of words that have a lexically marked high tone
- Koasati: tone language in which each word has a single lexically marked syllable carrying high (or falling or rising) pitch
Kabardian

• Kabardian stress on ultima if heavy (CVV, CVC), otherwise penult (Colarusso 1992, 2006, Gordon & Applebaum 2010)

*Final stress*

- бёсем (bèsem) – ‘host’
- т³рэдэрз (trëdërž) – ‘table’
- мэйвень (mëyvenь) – ‘kid’
- лра: (lra:) – ‘work (past interrog)’
- мэбэкем (mëbëkem’) – ‘this good host’

*Penultimate stress*

- ³равь (³равь) – ‘young’
- ³ра: (³ra:) – ‘table’
- ³ра:ра: (³ra:ra:) – ‘rooster’
- ³энжра: (³enžra:) – ‘good’
Nominal suffixes and nominal/verbal suffixes fall outside the stress domain

‘baːd̚æs
baːd̚æ -s
fly -DECL

‘sətɕəs
sə- tɕə -s
1ABS- write -DECL

‘vaːq’æt
vaːq’æ -t
shoe -PST

‘It is a fly’

‘I write’

‘It was a shoe’
‘bear (instrumental)’
damahem

dam ah m

‘wing (ergative pl.)’
wing -PL -ERG

‘It’s not bread’
weqapla

j’aqpl a

‘bread’
bread -NEG

‘bears (instrumental)’
’sepahem

’sep ah -k’a

‘bear’
bear -PL -INSTR
• Stress has a low functional load; there are no minimal pairs (to the best of my knowledge) except those based on morphological differences:

ʻmæʃ ʻbearʼ vs. mæʃ ʻthis milkʼ
mæʃ ʻbearʼ vs. meə ʻthis milkʼ
bear vs. this -milk
Phonetically, stress is associated with multiple acoustic correlates (not just higher F0): increased duration, greater intensity, and higher F0.
- Duration of vowels (averaged across seven speakers) as a function of proximity to the stressed syllable.
• Intensity of vowels (averaged across seven speakers) as a function of proximity to the stressed syllable
• Fundamental frequency of vowels (averaged across seven speakers) as a function of proximity to the stressed syllable
• Stressed syllables serve as docking sites for pitch accent in the intonation system

/ista:m'bul səʃəp'səw/ (Istanbul + I live) ‘I live in Istanbul.’
• Higher F0 normally associated with stress may be absent at the end of an Intonational Phrase, where a L% boundary tone pulls down F0 in final syllable

/ˈmeɪzəm ˈnəʊ dəˈkwæt/ (forest + to + we went) ‘We went to the forest.’
IP Boundary Tones

• L%: Statements, questions (wh- and yes/no)
• H%: Non-final items in a list, interrogative suffix -ʔe ‘isn’t it’, non-wh NPs in questions
Kabardian Summary

• Kabardian is a stress language
• Intonation system promotes certain stresses to pitch accents
• Tones are assigned by the intonation system rather than at the lexical level
Chickasaw

- Chickasaw stress is weight-sensitive
- All heavy (CVV and CVC) syllables carry at least secondary stress
- The final syllable carries primary stress in words lacking a long vowel
  - ‘isso'ba ‘horse’
  - ‘baʃ'po ‘knife’
  - ‘ok'fok'kol ‘type of snail’
  - ‘tʃaˌlak'ki? ‘Cherokee’
• In words containing a single long vowel (CVV), it carries primary stress

\begin{align*}
\text{'bakhja\text{m}a} & \quad \text{‘diaper’} \\
\text{a'bo\text{ko}ji} & \quad \text{‘river’} \\
\text{'ba\text{t}am\text{bi}} & \quad \text{name} \\
\text{ji\text{ki}} & \quad \text{‘buzzard’} \\
\text{o'fo\text{lo}} & \quad \text{‘screech owl’}
\end{align*}
In words containing multiple CVV syllables, there is variation, both inter and intraspeaker, in whether the rightmost or leftmost CVV carries primary stress.

\[
\begin{align*}
&tsi\pi:sali\text{_}tok \text{ (or } tsi\pi:sali\text{_}tok) & \text{‘I looked at you’} \\
&a:\text{jo'ka\text{_}tji?} \text{ (or } a:\text{jo'ka\text{_}tji?}) & \text{‘police station’} \\
&a:\text{ki'la\text{_}}? \text{ (or } a:\text{ki'la\text{_}}?) & \text{‘wick’} \\
&ta\text{_}os,sa\text{_}t\text{a\text{-}t} \text{ (or } ta\text{_}os,sa\text{_}t\text{a\text{-}t}) & \text{‘bank’ (subj)} \\
&na\text{_}f,ka\text{'pa\text{_}ko,ta?l\text{_}tji?} \text{ (or } na\text{_}f,ka\text{'pa\text{_}ko,ta?l\text{_}tji?}) & \text{‘hem’}
\end{align*}
\]
- Duration, F0, and Intensity values for vowels associated with different levels of stress (averaged over 8 speakers; standard deviations in parentheses)

<table>
<thead>
<tr>
<th></th>
<th>Duration (msec)</th>
<th>F0 (Hz)</th>
<th>Intensity (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>87 (24)</td>
<td>187 (43)</td>
<td>77.4 (5.7)</td>
</tr>
<tr>
<td>Secondary</td>
<td>76 (17)</td>
<td>180 (41)</td>
<td>75.8 (5.9)</td>
</tr>
<tr>
<td>Unstressed</td>
<td>58 (21)</td>
<td>159 (39)</td>
<td>74.9 (5.9)</td>
</tr>
</tbody>
</table>
• Unstressed vowels are centralized relative to stressed vowels and are subject to lenition processes (devoicing, deletion)
Rhythmic (iambic) lengthening (Munro and Ulrich 1984, Munro and Will mond 1994)

- Stressed vowels in open non-word-final syllables are phonetically lengthened (iambic lengthening)

  (tʃitʃóː)(kóʃ)(komóː)(tʃi)  ‘He makes you play’
  cf. (tʃokóʃ)(komóː)(tók)  ‘He played’

  (tʃikíː)(silíː)(tók)  ‘He bit you’
  cf. (kisíː)(litók)  ‘He bit it’

  (asáː)(bikáː)(tók)  ‘I was sick’
  cf. (abíː)(katók)  ‘He was sick’
• For words in final position of an IP, different principles of primary stress placement apply, though all heavy syllables still have at least secondary stress
• Primary stress at the IP-level is an intonational phenomenon: the primary stress is equivalent to a pitch accent (phonetically a high tone) which falls on a syllable within the final word of IP (cf. nuclear pitch accent placement in many languages [Ladd 1996])
• Chickasaw assigns the nuclear pitch accent in “top-down” fashion based on separate principles from those governing word-level stress rather than “bottom-up” to a syllable that has primary stress at the lexical level.

English: The man saw an giraffe.
Chickasaw: The man saw a gíráffe.
• Statements are the simplest case: the final syllable carries primary stress/pitch accent

mali:li ‘S/he runs.’

<table>
<thead>
<tr>
<th>L</th>
<th>H</th>
<th>H*</th>
</tr>
</thead>
<tbody>
<tr>
<td>ma</td>
<td>.li</td>
<td>'li</td>
</tr>
<tr>
<td>malili</td>
<td></td>
<td></td>
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<td></td>
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<td>3l</td>
</tr>
</tbody>
</table>

- Graph showing frequency (Hz) over time (ms)
Questions

• Primary stress on final CVV
  
  (kaˌtiːˌmihˈtãː) saˌhaˈʃáː ‘Why am I angry?’
  (ˌnanˈtaːt) ˌokˈtáːk ‘What is a prairie?’
  (kaˌtaːt) ˈjáː ‘Who is crying?’
  (ˌnanˈtaːt) ʃiˈwáː ‘What is striped?’
**Who is angry?**

<table>
<thead>
<tr>
<th>H</th>
<th>H</th>
<th>L</th>
<th>H</th>
<th>H*</th>
<th>L%</th>
</tr>
</thead>
<tbody>
<tr>
<td>ka</td>
<td>'taːt</td>
<td>ha</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>katahaat</td>
<td></td>
<td>hashaa</td>
<td></td>
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</tr>
</tbody>
</table>

[Diagram showing frequency and time values]
• Otherwise, on heavy (CVV, CVC) penult
 iʃma'li: tam ‘Did you run?’
 (,nan'ta:t) ha'tá: tʃim ‘What turned color?’
 (,nan'ta:t) tʃi'lá:k bi ‘What is dry and cracked?’
 (,nan'ta:t) iʃ'tó:k tʃank ‘What’s a watermelon?’
 (ka'ti:jak,ta) a'kán,ka? ‘Where’s the chicken?’
 (ka'ta:t) ba'tám,bi? ‘Who’s Baatambi’ ?’
• Otherwise on antepenult (either CVV or CVC due to a restriction against adjacent CV)

'málli₃tam ‘Did s/he jump?’
'ʃi:pà₃ta ‘Is it stretchy?’
(ⁿanʰtaːt) a'bóːkoʃi? ‘What’s a river?’
(ⁿanʰtah'tāː) 'pǐ,sam ‘What did s/he see?’
(ⁿanʰtaːt) 'tí,jak ‘What’s a pine tree?’
The text in the image is: "'málːita ‘Is s/he jumping?’"

The table in the image shows the following:

<table>
<thead>
<tr>
<th>L</th>
<th>H*</th>
<th>L%</th>
</tr>
</thead>
<tbody>
<tr>
<td>'mal</td>
<td>li</td>
<td>ta</td>
</tr>
<tr>
<td>mallita</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The diagram shows a graph with Hz on the y-axis and ms on the x-axis. The graph has a blue line indicating some form of data or analysis.
Morphology is also relevant for pitch accent placement:

suffixes attract the pitch accent
{pi,sa:}ˈliː,tam? ‘Was I looking at it?’ (underlyingly /pisalitam/)
{tʃofa:t},aʔtʃí:ta? ‘Will s/he be clean?’ (underlyingly /tʃofaʔtʃita/)

whereas prefixes reject it
(ka,ti,mih'ta:) iʃˈhiː,tə ‘Why are you dancing?’
(ka'ta:t) ,aʔˈhójoʔ ‘Who is looking over there?’
(ka'ta:t) i.liːˈpí,saʔ ‘Who is looking at herself/himself?’
• However, the ban on stress on final short vowels takes precedence over the attraction of stress by suffixes
  (ka,ti;mih'tā:) {hiːlāː},li? ‘Why am I dancing?’
  (ka,tah'tā:) {pi'sáː},li? ‘Who am I looking at?’
  (ka,ti;mih'tā:) {hiːlā}ʔ,tiʔi? ‘Why will s/he dance?’

• And the prefixal rejection of stress
  (nan,tah'tā:) ʔʃ{pa}m (underlyingly /ʃ-apam/) ‘What did you eat?’
  (ka,ti;mih'tā:) ʔh₃ʃ{lə} (underlyingly /hʃ-ala/) ‘Why are you (pl.) here?’
Relationship between stress and pitch accents

• Attraction of pitch accent by heavy penult is consistent with the stress on heavy syllables, e.g. tʃoːfáːta ‘Is s/he clean?’

• But, top-down pitch accent means that some unstressed syllables at the word-level receive pitch accents
ti'ʃo pis'a'tók ‘S/he was looking at the tisho (helper to medicine man)’
'nan'ta:t 'tíʃo ‘What is a tisho?’
Morpholexical accents ("grades")

<table>
<thead>
<tr>
<th>Grade form</th>
<th>gloss</th>
<th>Base</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>hîk:iʔja</td>
<td>be standing</td>
<td>hika</td>
<td>stand up</td>
</tr>
<tr>
<td>tʃofânta</td>
<td>be cleaner</td>
<td>tʃofaːta</td>
<td>be clean</td>
</tr>
<tr>
<td>itːibâk:akliʔtʃi</td>
<td>make a knocking sound</td>
<td>bakaʔtʃi</td>
<td>make a noise with wood</td>
</tr>
<tr>
<td>mafiːli</td>
<td>to start, run (car engine)</td>
<td>maliːli</td>
<td>run</td>
</tr>
<tr>
<td>toʃiʔna</td>
<td>be three</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>
Interaction between morpho-lexical and phonological pitch accents

- Prohibition against pitch accents on adjacent syllables (phonological accent fails to surface)

\[tʃofânta 'S/he is cleaner.'\]
tʃofâj:aʔtata ‘S/he is really clean.’

<table>
<thead>
<tr>
<th>L</th>
<th>H</th>
<th>L%</th>
</tr>
</thead>
<tbody>
<tr>
<td>tʃo</td>
<td>'faj</td>
<td></td>
</tr>
<tr>
<td>jaʔ</td>
<td>ta</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ta</td>
<td></td>
</tr>
<tr>
<td></td>
<td>chofáyya'tata</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3]</td>
<td></td>
</tr>
</tbody>
</table>
• But, if there is no clash, both a morpholexical and a phonological accent may surface

hôj:oʔlolí:ta ‘Am I wearing shoes?’

<table>
<thead>
<tr>
<th>L</th>
<th>H(\lambda)</th>
<th>!H(^{\circ})</th>
<th>L(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>hoj</td>
<td>jo</td>
<td>lo</td>
<td>li</td>
</tr>
<tr>
<td>hôyyo'lolita</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hz

ms 150 300 450 600 750

Hz

ms 150 300 450 600 750
Prosodic structure in Chickasaw

- Intonation Phrase (IP): Domain of pitch accent placement, final lengthening, final breathiness, terminal pitch excursion
- Accentual Phrase (AP): Domain of LHHL tonal pattern
- Minor Phrase (=Morphological Word): Domain of primary stress assignment
- Prosodic Word: Domain of rhythmic (=iambic) lengthening, pitch accent confined to rightmost prosodic word in IP
Accentual Phrase

• Canonical LHHL pattern
• Truncated in short APs
a'baːnom,pistə,nompoliʔat ma,liːli 'The preacher is running.'
Segmental diagnostics for AP
• flapping
• aspiration
• voicing
• vowel deletion

\[ a. \text{'min'ka't a'la} \rightarrow \text{'min'ka'r a'la} \text{ ‘The chief is here.’} \]
\[ b. \text{'hat:a'k. a.pir'la} \rightarrow \text{'hat:a.kh a.pir'la} \text{ ‘S/he helps the man.’} \]
\[ c. \text{'min'ka't a'la} \rightarrow \text{'min'ka'd a'la} \text{ ‘The chief is here.’} \]
\[ d. \text{t'ipo'ta't ja:} \rightarrow \text{t'ipo'ta'd ja:} \text{ ‘The child is crying.’} \]
\[ e. \text{fa'la j'kin} \rightarrow \text{fa'la j'kin} \text{ ‘the crow’s eye’} \]
IP Boundary Tones

- $\emptyset$ (or HL%): Statements
- L%: Questions (yes/no and wh), postverbal nouns, dependent clauses
- HL% commands
Chickasaw Summary

• Chickasaw is a stress language with limited use of tone in certain lexical items
• Intonation system assigns pitch accents based on different principles than stress system
• But, heavy syllables attract both stress and pitch accents
• Lexical tones may not clash with phonological pitch accents; in case of clash, lexical tone survives
Koasati
(ongoing work with Jack Martin and Linda Langley)

Unpredictable tone occurs not only in certain verbs but also in nouns (somewhat different account from Kimball 1991)

- Falling tone on initial syllable: chî:skoko ‘robin’
- Rising tone on penult: mobî:la ‘car’, hopô:ni ‘cook’
- High tone on final syllable (statistically prevalent): palaná ‘bean’, paka:lí ‘flower’
• Contour tones appear to be limited to syllables with a long vowel or a sonorant coda, suggesting that high tones align with moras rather than syllables.

\[
\begin{align*}
&\text{H} \\
&\text{H} \\
&\text{H}
\end{align*}
\]

- chí:s ko ko ‘robin’
- mo bǐ: la ‘car’
- pa la ná

• In nouns, rising, falling, and high tones appear not to contrast, but are predictable from moraic structure and location of syllable
There is evidence that the high tone found on the final syllable is assigned by the intonation system, i.e. a phrase-final (Accentual Phrase) tone

- Words with a non-final high tone have an additional (downstepped) high on the final syllable
• The final high tone can be either preserved or lost depending on the phrasal context in which it appears
There is often a high tone at the beginning of phrases, e.g. *tabàtkal*
Verbs have a richer array of tonal contrasts in the penult
• l-grade with falling pitch in the penult
• g-grade with rising pitch in the penult
• negation with level high pitch in the penult
L-grade ɨ:si-l ‘I am taking’ vs. G-grade ɨ:si-l ‘I am holding’
• There is no process of rhythmic lengthening or other salient phonetic properties (at least discovered yet) that suggest that stress is relevant in Koasati
Prosodic Structure in Koasati

• Intonation Phrase (IP): Domain of final lengthening, final breathiness, terminal pitch excursion, pitch accent?
• Accentual Phrase (AP): Domain of final (and initial?) high tone
• Other domains?
IP Boundary Tones

- HL% in commands
- L(H)% in statements (see \textit{i:sil})
- H% in questions (both wh- and yes/no-questions)
$hat \textit{fal}^{HL}$ ‘stand up!’ vs. $hat \textit{fal}^{L}$ ‘he/she is standing up (getting into that position)’
jok sat\textipa{\textdiaeresis}\textipa{\textbar}ok \textipa{om\textipa{\textbar}iH} ‘Is this a rock?’
Koasati Summary (preliminary)

- Koasati is a tone language without stress
- Tonal events are attributed to either lexical tones or intonational boundary tones
- Tonal contrasts are limited (few in nouns, positionally limited in verbs)
- No independent evidence (e.g. rhythmic vowel lengthening, intonational pitch accents) for stress thus far
Comparative Muskogean

- Limited lexical tone exists in all Muskogean languages, not just Chickasaw and Koasati
• Relatively little is known, however, about relationship between word-level and phrase-level prominence
Summary

- Kabardian has a prototypical stress system: obligatory, culminative, demarcative, syllable-based
- Chickasaw also has a prototypical stress system: obligatory, culminative, demarcative, syllable-based, rhythmic
- Chickasaw and Koasati both have limited tone systems, Koasati less so
## Summary of Parameters

<table>
<thead>
<tr>
<th></th>
<th>Chickasaw</th>
<th>Kabardian</th>
<th>Koasati</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culminative</td>
<td>√</td>
<td>√</td>
<td>X</td>
</tr>
<tr>
<td>Rhythmic</td>
<td>√</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Unit</td>
<td>Syllable</td>
<td>Syllable</td>
<td>Mora</td>
</tr>
<tr>
<td>Weight-sensitive</td>
<td>√</td>
<td>√</td>
<td>X</td>
</tr>
<tr>
<td>Demarcative</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Non-F0 cues</td>
<td>√</td>
<td>√</td>
<td>??</td>
</tr>
</tbody>
</table>
• Stress and tone may be viewed as separate continua with location of each language along each continuum being a function of number and type of prototypical features
• Ultimately, it is more informative to discuss specific properties of a language rather than to assign languages to discrete categories (Hyman 2006)
Thank you!

Acknowledgments:

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• A special thanks to all the speakers for their time and expertise!
For more information

Kabardian


Muskogean


