Syncope in East Cree: Phonological or Phonetic?

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Introduction

• Syncope (vowel deletion) in East Cree can be analysed as a phonological or a phonetic process.
• Bears on:
  – the phonemic basis of the East Cree orthography
  – syllable structure
  – abstract metrical structure
Outline

• Background (East Cree)
• Background (phonology vs. phonetics)
• The problem (why the status of syncope matters)
• The proposed solution
• Methodology
• Findings
• Conclusions

East Cree and Algonquian
East Cree

Syllable structure
words without syncope

\[
\begin{align*}
\sigma & \quad \{ p, t, \text{tʃ}, k, k^w \} \\
& \quad \{ s, \text{sʃ}, h \} \\
& \quad \{ i, i̯, ū, u \} \\
& \quad \{ m, n \} \\
& \quad \{ w, y \} \\
\end{align*}
\]
# Syncope examples

Northern East Cree, but Southern is similar

<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
<th>Meaning</th>
</tr>
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<tbody>
<tr>
<td>ispikun</td>
<td>[s.'pi.kon, js.'pi.kon]</td>
<td>taste</td>
</tr>
<tr>
<td>uhpinim</td>
<td>[x.'pin.nam, oh.'pin.nam]</td>
<td>s/he lifts it</td>
</tr>
<tr>
<td>uhtaawiimaau</td>
<td>[x.ta.'wi.maw, gh.ta.'wi.maw]</td>
<td>his/her father</td>
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<tr>
<td>ushchiishikw</td>
<td>[tʃiː.tʃiːtʃikʷ, of.'tʃiː.sikʷ]</td>
<td>his/her eye</td>
</tr>
</tbody>
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# Syncope environment

- **Metrical positions**
  - typically affects weak syllable
  - but metrical structure in East Cree is abstract
    - only one pitch-accented V per word
Syncope environment

- Segmental conditions
  - more likely between
    - voiceless segments /p,t,k,s,ʃ,tʃ/
    - homorganic Cs [t_n], [p_m]
  - near obligatory in some contexts (shown later)

Phonology vs. phonetics

- Diagnostics — see §1.3 of the handout
- Phonology:
  - categorical presence or absence
- Phonetics:
  - optionality
  - gradient continuum between, e.g., English [ə] and [ɒ] / [ʰ]
The problem

- Why the status of syncope matters for East Cree
  - cannot characterize syllable structure if V is deleted (phonology)
    - syllable structure completely different for words with or without syncope.
  - example (4) am(i)sk\(^w\) ‘beaver’
- few paradigmatic alternations
  - see next slide / example (5) in handout

Syllable structure
words with syncope

No alternations (Northern East Cree Examples)

| 
| nitihutaanaanaatik | [n.tʰ:tu.ta.:naːˈdaːdikʰ] | I do it in the distance |
| nitihutaanaatik | [n.tʰ:tu.ta.:ˈnaːdikʰ] | we do it in the distance |
| nitihutimwaanaanaatik | [n.tʰ:tu.da.mwa:naːˈnaːdikʰ] | we do it in the distance (relational) |
| nitihutimwaanaatik | [n.tʰ:tu.te.mwa:ˈnaːdikʰ] | you do it in the distance (relational) |
| c.f. English alternations | [ˈfəʊɡæf] | [ˈfəʊɡæf] / [ˈfəʊɡæf] |
Hypothesis

- Syncope is phonetic; syllable structure is unaffected.
- Supporting evidence
  - Impressionistic transcriptions suggest an optional or gradient, phonetic rule
  - see next slide / example 6 on handout

Towards a solution

Transcriptions suggest gradience (Northern Examples)

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Proposed solution

- Acoustic analysis of syllable, C and V duration
- Assumptions
  - gestural overlap (Articulatory / Gestural Phonology)
  - Abstract phonological units (phonology) and a level of phonetic implementation (Cohn)

Proposed solution

- Phonetic implementation
  - Variation in timing of gestures within and across syllables
  - Vowels in syllables with syncope are prone to gestural overlap
    - effect: they’re less prominent
Gestural overlap

- Cs in the syllable margin overlap the vocalic nucleus
  - (Beckman 1996; Coleman 1992, 1994, 2001; Davidson 2006; Dirksen & Coleman 1997; Goad & Brannen 2003)
- Overlap ≠ shortening
  - The inherent duration of the vowel may / may not be affected (depending on whether or not shortening occurs)

Articulatory phonology: timeline of a gesture
nishiki [ɲʃiki:] 'my skin'  kânichī ['kantʃi:] 'sweater'
Predictions

<table>
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<tr>
<th>Phonological process</th>
<th>Phonetic process</th>
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<tr>
<td>Syllable nucleus deleted</td>
<td>Syllable nucleus remains</td>
</tr>
<tr>
<td>V properties such as DURATION erased</td>
<td>V properties such as DURATION unaffected, but V quality is eclipsed by surrounding C gestures</td>
</tr>
<tr>
<td>C properties such as DURATION unaffected</td>
<td>C's can lengthen</td>
</tr>
<tr>
<td>Typically, stray C's deleted</td>
<td>Alternatively, C's duration unaffected, but timing of C onset and offset is affected</td>
</tr>
</tbody>
</table>

Methodology

- One Southern East Cree speaker
- One Northern East Cree speaker
  - (not ideal to mix sub-dialects)
- Word list, speech rate not fast
Acoustic studies (Logan, Dyck)

- Syllable length (Southern East Cree):
- Measured length of
  - elided and unelided CV and CVh syllables (Dyck)
  - unelided vowels in CV syllables (Logan)
    - pitch-accented vs. non-pitch-accented
      - one pitch-accent per word

Acoustic study (Terry)

- Measured length of [s, ʃ, m, n]
  - No syncope [nɪˈkʊs:] ‘my son’
  - Syncope [niˈkiːs:] ‘my skin’
  - Southern East Cree
Nasal, no syncope
NÂchîushtam

Nasal, syncope
Nîchikush [ŋ]
Acoustic study (Power)

• Length of aspiration of /p, t, k/
  – No syncope PVP, PVVP
    • tipāchimuwin [tapi̲ʃiˈmuwən] ‘story’
    • /p,t,k/ [p,b,t,d,k,g]
  – Syncope PØhP
    • atihkw [ˈʌtʰkw] ‘caribou’
    • /p,t,k/ [pʰ, tʰ, kʰ]
  – Northern East Cree

Plosive aspiration, no syncope
ânisKUtâpân
Plosive aspiration, syncope  
\textit{aKUHp}

Findings — §5.1 syllable length

• No significant difference in length between
  – non-elided CV syllables
    \((M=0.14262, \ SD= 0.00132)\) and
  – elided CVh syllables
    \((M= 0.13659; \ SD= 0.00079)\)
    \((p > 0.05)\)
Findings — syllable length

- (Logan 2010): no significant difference in length between
  - pitch-accented vowels in CV syllables
    \((M=0.0716, SD=0.0032)\) and
  - non-pitch-accented vowels in unelided CV syllables
    \((M=0.0647, SD=0.0018); \ p > 0.05\)

Findings — syllable length

- Syllables with short Vs are the same length, regardless of whether their nuclei are pitch-accented, non-pitch-accented, or elided.
- V duration unaffected by syncope
- If gestural overlap occurs, it’s not due to vowel shortening
- Could be due to C lengthening
Findings — C length

- Cs are shorter in syllables with full vowels
- Cs are longer in syllables with elided vowels
  – [p, b] vs. [pʰ]
  – [m] vs. [m]
- Differences in length are significant
Duration of /s, f/

shorter before a full vowel
M= 0.1241, SD= 0.0007

longer in syncope environment
M= 0.1639, SD= 0.0016 \( t(88)= 6.11061, p<0.01 \)

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Duration of non-word-final nasals

shorter before a full vowel
M= 0.0234, SD= 0.0000

longer in syncope environment
M= 0.0628, SD= 0.0005 \( t(103)= 4.1578, p<0.01 \)
No interaction (onsets/codas)

Conclusions

- Syllable length / abstract timing units unaffected
- C length is in complementary distribution with short vowels.

<table>
<thead>
<tr>
<th>No Syncope</th>
<th>Syncope</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV or VC</td>
<td>C:</td>
</tr>
<tr>
<td></td>
<td>pʰ, η, f:</td>
</tr>
</tbody>
</table>

- Could be Compensatory Lengthening?
Against CL (phonological process)

- [m,n] never in codas in words without syncope
- Yet [m,n] lengthen and eclipse EITHER the following OR preceding V
- CL can’t handle lengthening of onset Cs
  - kânichî ['kaːnʃiː] ‘sweater’
  - nishikî [ŋʃiːkiː] ‘my skin’

True CL vs. East Cree

- True CL
  - pat → paa
  - paa.ta → pat.ta
- East Cree
  - ti.ni → tŋ
  - ni.ti → ŋti
Summary / Interpretation

<table>
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<th>Observation</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complementary distribution of C length and full V's</td>
<td>conditions for syncope include phonological environment (metrically strong / weak position)</td>
</tr>
<tr>
<td>No differences in syllable length</td>
<td>syllable nuclei unaffected by the process (not deleted)</td>
</tr>
<tr>
<td>Adjacent Cs lengthen, regardless of syllable position</td>
<td>phonetic process</td>
</tr>
<tr>
<td>Optionality, gradience</td>
<td>phonetic process</td>
</tr>
</tbody>
</table>

Conclusions

- Syllable structure is unaffected by syncope
- East Cree has a typical Algonquian syllable template
  - #(C)V{h,s,f}.C#
- Orthography is largely phonemic
- Orthography can be the basis for phonological analysis
Acknowledgements

• Funding for this research is provided by
• SSHRC Standard Research Grants
  – #856-2004-1028 (Junker, MacKenzie)
• Memorial Undergraduate Career Experience Program.