Introduction*

Syncope (vowel deletion) in East Cree can be analysed as a phonological or a phonetic process.

Determining the status of syncope has implications for (the learnability of) syllable and foot structure, and for the phonemic basis of the East Cree orthography.

Outline

Introduction.................................................................................................................................................. 1
Outline......................................................................................................................................................... 1
1. Background.............................................................................................................................................. 2
   1.1 Situating East Cree .............................................................................................................................. 2
   1.2 East Cree phonemes, syllable structure............................................................................................ 2
   1.3 Phonology vs. phonetics .................................................................................................................... 3
2. The problem: why the status of syncope matters .................................................................................. 3
3. Proposed solution ..................................................................................................................................... 4
   3.1 Proposal ............................................................................................................................................ 4
   3.2 Predictions ........................................................................................................................................ 6
4. Methodology .......................................................................................................................................... 6
5. Findings ................................................................................................................................................ 9
   5.1 Syllable length .................................................................................................................................. 9
   5.2 Consonant length .............................................................................................................................. 9
6. Conclusions .......................................................................................................................................... 11

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1. Background

1.1 Situating East Cree

Figure 1 - Cree-Montagnais-Naskapi dialect continuum (Junker 2004)

1.2 East Cree phonemes, syllable structure

- Similar in other Cree-Montagnais-Naskapi dialects; for Plains Cree, see Wolfart (1996).

1. Consonants

\[
\begin{align*}
\text{p} & \quad \text{t} & \quad \text{ch} \quad [\text{tʃ}] & \quad \text{k}, \quad \text{k}^w \\
\text{s} & \quad \text{sh} \quad [ʃ] & \quad \text{h} & \\
\text{m} & \quad \text{n} & \\
\text{w} & \quad \text{y} & \\
\end{align*}
\]

2. Vowels

<table>
<thead>
<tr>
<th>Heavy</th>
<th>Light</th>
</tr>
</thead>
<tbody>
<tr>
<td>\text{i} \ [i(:)] \ [u(:)]</td>
<td>\text{û} \</td>
</tr>
<tr>
<td>\text{æ} \ [æ(:), \ ε(:)]</td>
<td></td>
</tr>
</tbody>
</table>

\[^1\text{[w] and [y] are allophones of /u/ and /i/.}\]
Syncope in East Cree: phonological or phonetic?

3. Syllable structure (words without syncope); e.g. a.mis.kʷ ‘beaver’

<table>
<thead>
<tr>
<th>Onsets</th>
<th>Nuclei</th>
<th>Codas</th>
<th>Word-final appendix</th>
</tr>
</thead>
<tbody>
<tr>
<td>p t tʃ k, kʷ</td>
<td>i, i ū, u</td>
<td>s ʃ h</td>
<td>p t tʃ k, kʷ</td>
</tr>
<tr>
<td>s ʃ h</td>
<td>â, a</td>
<td>s ʃ h</td>
<td>m n</td>
</tr>
<tr>
<td>m n</td>
<td>w y</td>
<td>w y</td>
<td></td>
</tr>
</tbody>
</table>

1.3 Phonology vs. phonetics

<table>
<thead>
<tr>
<th>Grammatical level</th>
<th>Diagnostics</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHONOLOGY (ABSTRACT UNITS)</td>
<td>• Categorical rules</td>
<td>• V is either present or absent</td>
</tr>
<tr>
<td></td>
<td>• Potential effects on other phonological units</td>
<td>• V presence/absence has consequences for syllable and foot structure</td>
</tr>
<tr>
<td>PHONETIC IMPLEMENTATION (PRONUNCIATION)</td>
<td>• Gradient rules</td>
<td>• V deletion → resyllabification, Stray Erasure of Cs, etc.</td>
</tr>
<tr>
<td></td>
<td>• No effect on phonological units</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Continuum in pronunciation between present and absent vowel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Syllables are simply pronounced differently</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Progressively shorter [a]s become [ŋ], then [ʰ]</td>
</tr>
</tbody>
</table>

- Aspiration [ʰ] is in complementary distribution with schwa [a] in a number of Salishan languages; conditioning factors include unstressed position, and location of [a] between voiceless segments (Urbanczyk 1977:77-80).
- Schwa deletion in English is the endpoint of a phonetic reduction process, resulting from gestural overlap; conditioning factors include unstressed position, and location of [a] between voiceless segments, and speech rate (Beckman 1996; Davidson 2006).
- Voiceless vowels are aspiration with formant structure in Cayuga (Doherty 1993: 276-94), Comanche (Jakobson, Fant, and Halle 1967:52).

2. The problem: why the status of syncope matters

4. Syllable structure (words with syncope); e.g. am.skʷ?

<table>
<thead>
<tr>
<th>Onsets</th>
<th>Codas</th>
<th>Word-final appendix</th>
</tr>
</thead>
<tbody>
<tr>
<td>p t tʃ k, kʷ</td>
<td>s ʃ h</td>
<td>p t tʃ k, kʷ</td>
</tr>
<tr>
<td>s ʃ h</td>
<td>m n</td>
<td>s ʃ h</td>
</tr>
<tr>
<td>m n</td>
<td>w y</td>
<td>m n</td>
</tr>
<tr>
<td>w y</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Cannot characterize syllable structure, appendices, if phonological vowel deletion occurs.
- Paradigmatic alternations like English [ˈfərəɡəf] vs. [fəˈtəɡəfə] rare in EC.
5. Lack of alternation in NEC paradigms

<table>
<thead>
<tr>
<th>Orthographic form</th>
<th>Phonetic realizations</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. nitihtutânântak</td>
<td>[n.tʰ.tu.ta:.na:.dikʰ]</td>
<td><em>I do it in the distance</em></td>
</tr>
<tr>
<td>b. nitihtutântak</td>
<td>[n.tʰ.tu.ta:.na:.dikʰ]</td>
<td><em>we do it in the distance</em></td>
</tr>
<tr>
<td>c. nitihtutimwânântak</td>
<td>[n.tʰ.tu.ta.mwa:.na:.dikʰ]</td>
<td><em>we do it in the distance (relational)</em></td>
</tr>
<tr>
<td>d. nitihtutimwânântak</td>
<td>[n.tʰ.tu.ta.mwa:.na:.dikʰ]</td>
<td><em>you do it in the distance (relational)</em></td>
</tr>
</tbody>
</table>

3. Proposed solution

- Northern East Cree data suggest that syncope is a gradient, phonetic process.

6. NEC syncope — transcriptions suggest gradient outcomes

<table>
<thead>
<tr>
<th>Orthographic form</th>
<th>Phonetic realizations</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. is.pi.kun</td>
<td>[s.'pi.kun], [j.s.'pi.kun]</td>
<td>taste</td>
</tr>
<tr>
<td>b. uh.pi.nim</td>
<td>[x.'pi.nam], [uh.'pi.nam]</td>
<td>s/he lifts it</td>
</tr>
<tr>
<td>c. uh.tâ.wi.mâu</td>
<td>[x.tæ.'wi.mæw], [q.h.tæ.'wi.mæw]</td>
<td>his/her father</td>
</tr>
<tr>
<td>d. ush.chi.shikw</td>
<td>[bʃ.'dʒi:.ʃikʰ], [af.'dʒi:.ʃikʰ]</td>
<td>his / her eye</td>
</tr>
</tbody>
</table>

- Problem:
  - Reliance on impressionistic transcriptions;
  - Impressionistic transcriptions are suggestive, but provide only one type of evidence for the status of syncope.
- Solution: shed light on the status of syncope through
  - Acoustic analysis
  - Interpreted within the framework of Gestural or Articulatory Phonology (Browman & Goldstein 1990)
  - Plus, phonological units play a role. (This is a necessary departure from Articulatory Phonology, but is consistent with Cohn’s Phonetic Implementation model.)

3.1 Proposal

- Syncope is phonetic; the vowel nucleus is not deleted.
- Instead, gestural overlap occurs.
- In syncope environments, consonants in the syllable margin overlap the nucleus; sometimes, they completely eclipse the vocalic nucleus. (Beckman 1996; Coleman 1992, 1994, 2001; Davidson 2006; Dirksen and Coleman 1997; Goad et al. 2003).

7. Syllables with [n, ŋ] in coda; no syncope [koʃ, km]
8. Syllables with [n, j] in coda; gestural overlap (syncope) [kʃ, kŋ]

9. Syllables with [n] in onset, no syncope [ni]

10. Syllables with [n] in onset, syncope [ŋ]

11. Syllables with [n] in onset, syncope [n]
3.2 Predictions

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

4. Methodology

- Word-list from one Southern East Cree speaker, collected for the [http://www.east.cree.org](http://www.east.cree.org) website; the sound files can be heard at [http://www.ucs.mun.ca/~cdyck/eastcree.htm/SEC_sound_files_1.htm](http://www.ucs.mun.ca/~cdyck/eastcree.htm/SEC_sound_files_1.htm)
- One speech rate: not fast.
- Measured length of
  - unelided CV syllables
  - elided CV and CVh syllables
- Measured length of non-word-final /n, m, s, f/ in onset and coda position (positions conflated for t-tests).
- Measured length of release for plosives /p, t, k/ in onset position.
- Segment selection identified in Praat (Boersma and Weenink 2009) by ear, waveform, spectrogram. Examples are provided below.
Syncope in East Cree: phonological or phonetic?

12. Nasal, no syncope Nâchîushtam [na: ...]

13. Nasal, syncope Nichikush [ŋ ...]
14. Plosive aspiration, no syncope âniskUtâpân
[... ko ...]

15. Plosive aspiration, syncope aKUh ‘coat’
[... kʰ ...]
5. Findings

5.1 Syllable length
- No significant difference in length for non-elided CV syllables ($M=0.14262$, $SD=0.00132$) and elided CV(h) syllables ($M=0.13659$, $SD=0.00079$); ($p > 0.05$)
- (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 ($M=0.0647$, $SD=0.0018$); ($p > 0.05$).
- Syllables are the same length, regardless of whether they are pitch-accented, non-pitch-accented, or elided.

5.2 Consonant length
- Cs are significantly shorter in syllables with full vowels, and significantly longer in syllables with apparently elided vowels.

16. Length of release for non-word-final plosives

- The plosives /p,t,k/ in SEC have little aspiration when followed by a full vowel ($M=0.0234$, $SD=0.0000$), but are heavily aspirated in syllables that have undergone syncope ($M=0.0855$, $SD=0.0013$); ($t(52)=11.6619$, $p<0.01$).
17. Duration of non-word-final fricatives

![Average duration of fricatives](image)

- The fricatives /s, f/ in SEC are shorter when followed by a full vowel (M= 0.1241, SD= 0.0007), than when followed by a deleted vowel (M= 0.1639, SD= 0.0016); (t(88)= 6.1061, p<0.01).
- Similarly, in English words like s'pose/suppose, “...the duration of /s/ is significantly longer in tokens with elision than in tokens which exhibit the vowel...” (Davidson 2006:91).

18. Duration of non-word-final nasals

![Average duration of nasals](image)

- The nasals /m, n/ in SEC are shorter when followed by a full vowel (M=0.0234, SD=0.0000), than when followed by a deleted vowel (M= 0.0628, SD= 0.0005); (t(103)= 4.1578, p<0.01).
6. Conclusions

Consonant length is in complementary distribution with full vowels (as in Salish; Urbanczyk 1997)

<table>
<thead>
<tr>
<th>Syncope environment</th>
<th>Elsewhere</th>
</tr>
</thead>
<tbody>
<tr>
<td>C:</td>
<td>CV or VC</td>
</tr>
</tbody>
</table>

- Against Compensatory Lengthening (CL; a phonological account)
  - CL: V shortens, coda C lengthens; CL never affects onsets
  - In EC, [m,n] never in codas in words without syncope
  - Yet [m,n] lengthen, eclipsing the following nucleus:
    - kâñîchî [ˈkɑːntʃi:] 'sweater'
    - nîshikî [nɪʃiki:] 'my skin'

- EC syncope is phonetic process: increased gestural overlap in syncope environment, with no effect on syllable structure
- Syllable structure is unaffected; evidence: syllable duration is the same, regardless of environment.
Syncope in East Cree: phonological or phonetic?

References


