Syncope in East Cree: Phonological or Phonetic?

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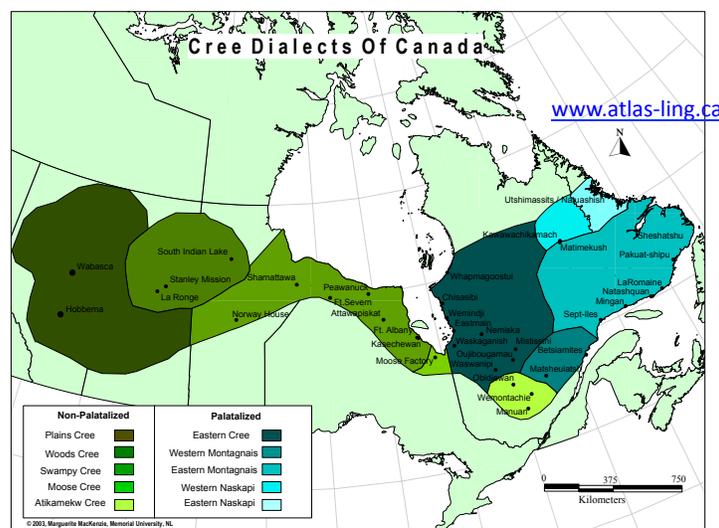University of Western Ontario

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
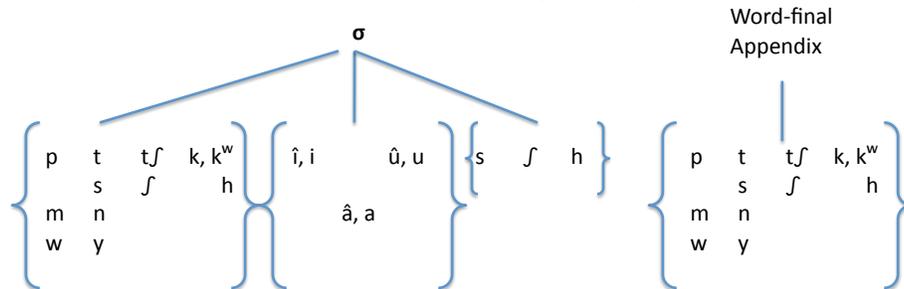- Methodology
- Findings
- Conclusions

East Cree and Algonquian

East Cree

East Cree Communities And Dialects

QUÉBEC

Whapamagoostui
Chisasibi · Northern EC · LABRADOR
Wemindji
Eastmain
· Nemaska · Southern
Waskaganish · Coastal EC
Mistissini · Southern Inland EC
· Ouje-Bougoumou
Waswanipi

Syllable structure
words without syncope

σ

Word-final Appendix

p	t	tʃ	k, kʷ	î, i	û, u	s	ʃ	h	p	t	tʃ	k, kʷ
s	ʃ	h							s	ʃ	h
m	n				â, a				m	n	
w	y								w	y	

Syncope examples

Northern East Cree, but Southern is similar

ispikun	[s.ˈpɪ.kʊn, i̯s.ˈpɪ.kʊn]	taste
uhpinim	**[x.ˈpm̩.nəm, ʊh.ˈpm̩.nəm]**	**s/he lifts it**
uhtaawiimaau	[x.ta.ˈwi.maw, ʊ̯h.ta.ˈwi.maw]	his/her father
ushchiishikw	[ʰʃ.ˈtʃiː.ʃɪkʷ, ʊʃ.ˈtʃiː.sɪkʷ]	his/her eye

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:
  - cagetorical presence or absence
- Phonetics:
  - optionality
  - gradient continuum between, e.g., English [ə] and [ə̥] / [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)

nitihtutaanaanaatik	[n̥.tʰ.tu.taː.naːˈdaːdɪkʰ]	I do it in the distance
nitihtutaanaatik	[n̥.tʰ.tu.taːˈnaːdɪkʰ]	we do it in the distance
nitihtutimwaanaanaatik	[ˈn̥.tʰ.tu.də.mwa.naː. ˈnaːdɪkʰ]	we do it in the distance (relational)
nitihtutimwaanaatik	[ˈn̥.tʰ.tu.tə.mwaːˈnaːdɪkʰ]	you do it in the distance (relational)
c.f. English alternations	[ˈforəgɹæf]	[fəˈtʰɑgɹəfi] / [fˈtʰɑgɹəfi]

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)

ispikun	[s.ˈpɪ.kʊn, i̯s.ˈpɪ.kʊn	taste
uhpinim	[x.ˈpɪn.nəm, ʊh.ˈpɪn.nəm]	s/he lifts it
uhtaawiimaau	[x.ta.ˈwi.maw, ʊ̯h.ta.ˈwi.maw]	his/her father
ushchiishikw	[ʰʃ.ˈtʃiː.ʃɪkʷ, ʊʃ.ˈtʃiː.sɪkʷ]	his/her eye

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)
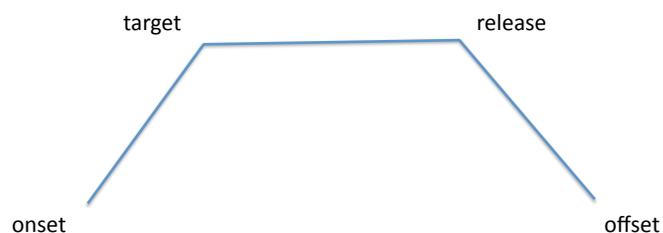
Proposed solution

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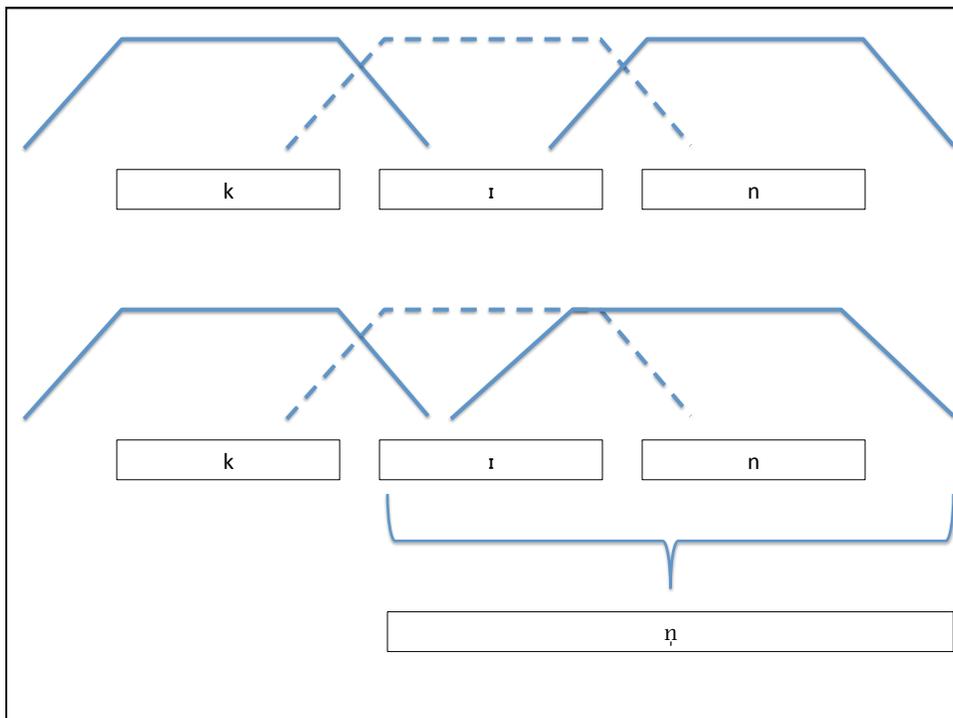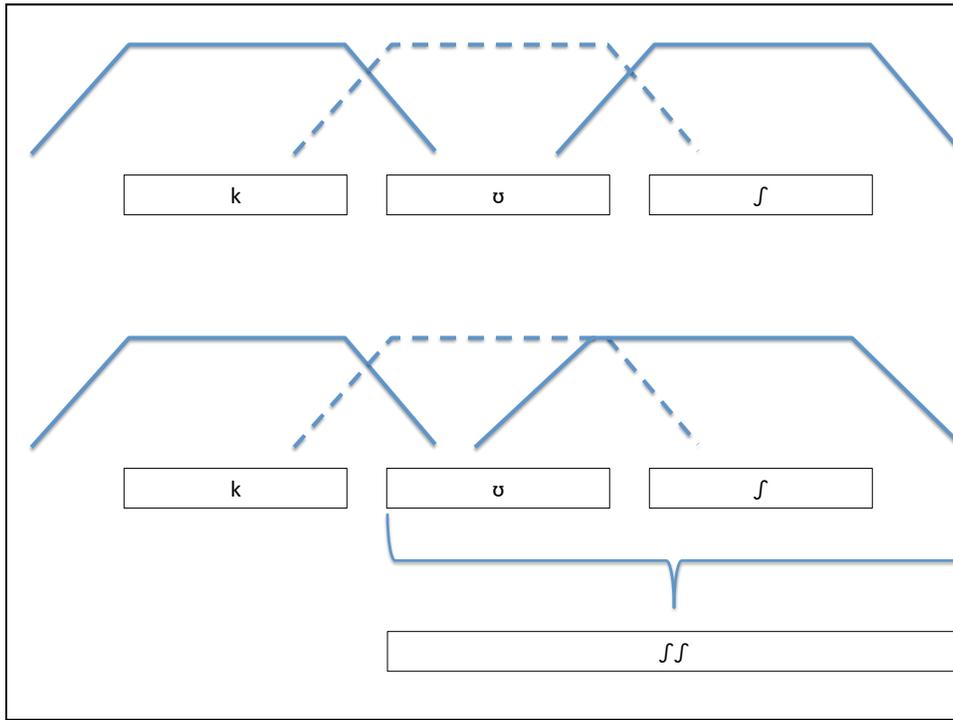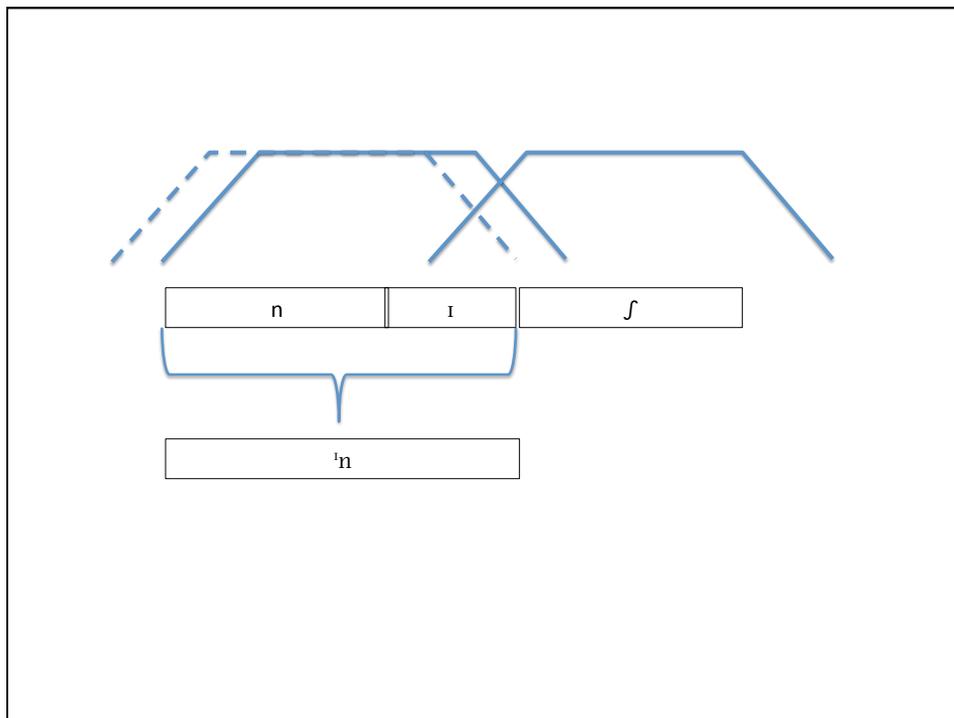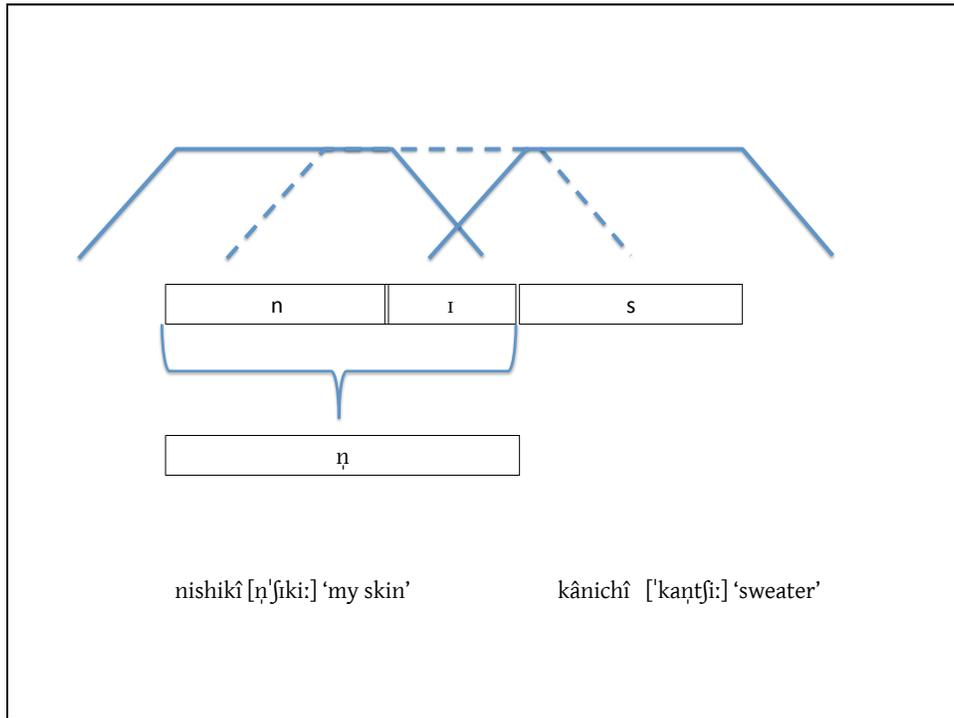   - effect: they're less prominent

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

target · · · · · · · · · · · · release

onset · · · · · · · · · · · · offset

| k | ʊ | ʃ |

| k | ʊ | ʃ |

| ʃʃ |

| k | ɪ | n |

| k | ɪ | n |

| n̩ |

nishikî [ŋˈʃɪki:] 'my skin'   kânichî [ˈkaɳtʃi:] 'sweater'

Predictions

Phonological process	Phonetic process
Syllable nucleus deleted	Syllable nucleus remains
V properties such as DURATION erased	V properties such as DURATION unaffected, but V quality is eclipsed by surrounding C gestures
C properties such as DURATION unaffected	Cs can lengthen
Typically, stray Cs deleted	Alternatively, C duration unaffected, but timing of C onset and offset is affected

Methodology

- One Southern East Cree speaker
- One Nortern 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
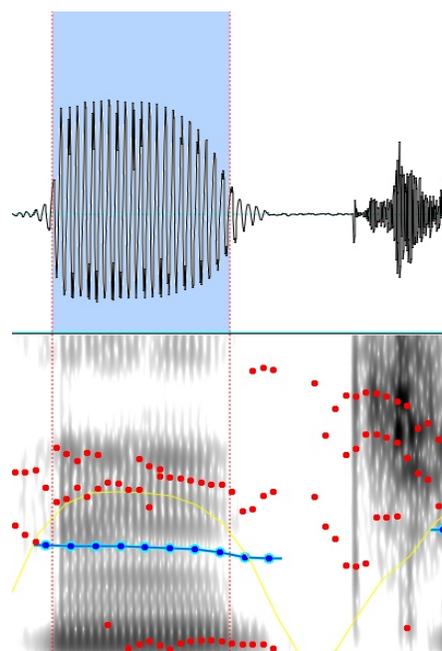   - one pitch-accent per word

Acoustic study (Terry)

- Measured length of [s, ʃ, m, n]
  - No syncope [nɪˈkʊsː] 'my son'
  - Syncope [n̩ˈʃɪkiː] 'my skin'
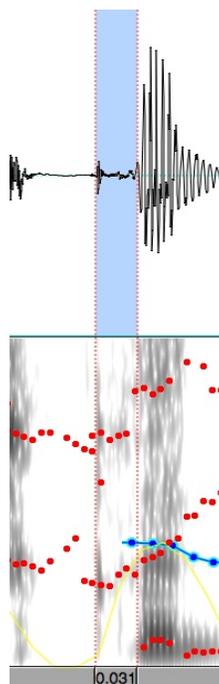 - Southern East Cree

Nasal, no syncope
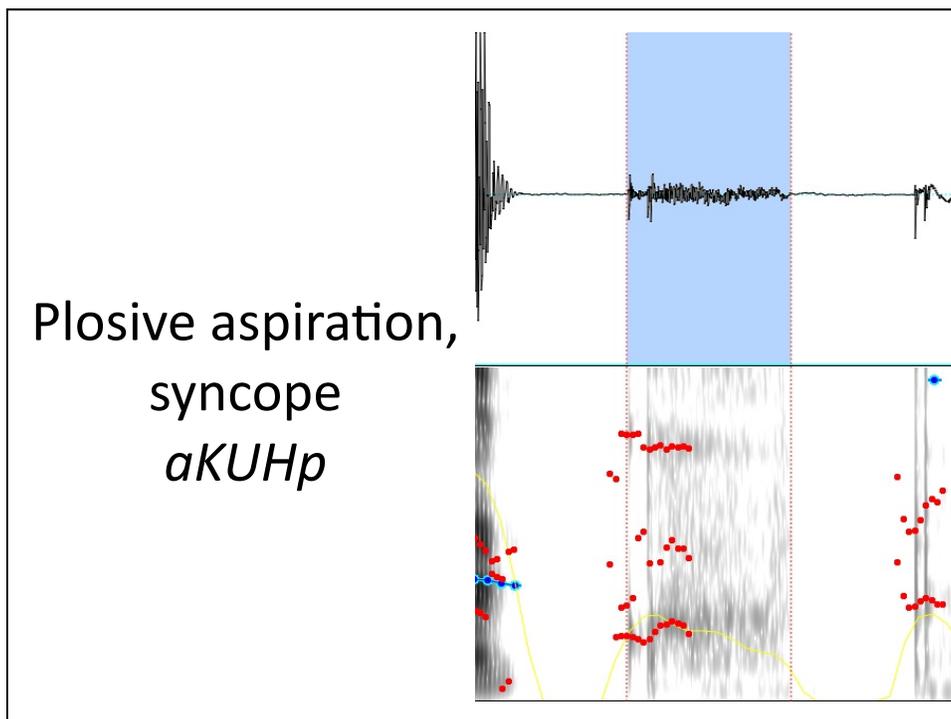*NÂchîushtam*
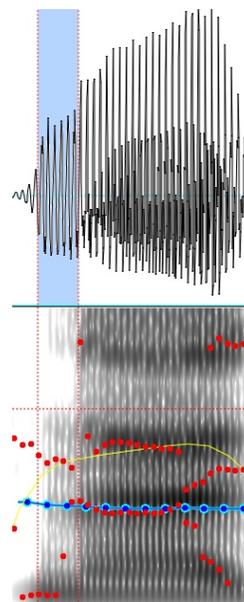
Nasal, syncope
NIchikush [ṇ]

Acoustic study (Power)

- Length of aspiration of /p, t, k/
  - No syncope PVP, PVVP
    - tipâchimuwin [təpatʃɪˈmuʷən] 'story'
    - /p,t,k/ [p,b,t,d,k,g]
  - Syncope PØhP
    - atihkw [ˡʌtʰkʷ] 'caribou'
    - /p,t,k/ [pʰ, tʰ, kʰ]
  - Northern East Cree

Plosive aspiration,
no syncope
ânisKUtâpân

Plosive aspiration, syncope
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. [m̩]
- Differences in length are significant

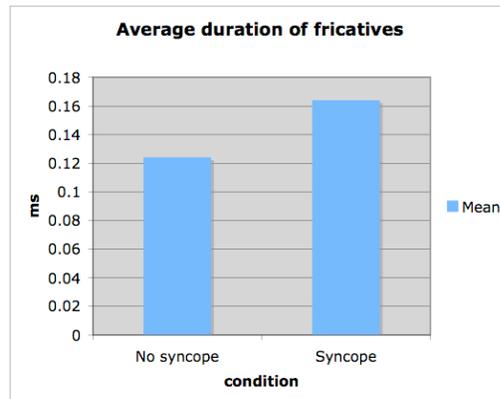## Length of release for /p,t,k/

Plosive aspiration
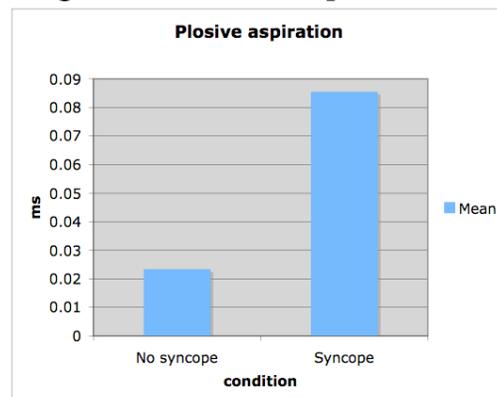
little aspiration before a full vowel
M=0.0234, SD=0.0000

heavily aspirated in sycope environment
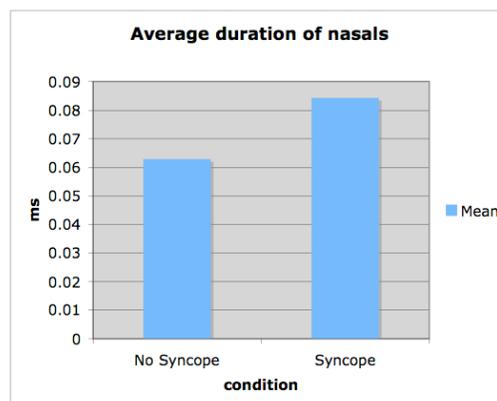M=0.0855, SD=0.0013   t(52)= 11.6619, p<0.01

Duration of /s, ʃ/

Average duration of fricatives

shorter before a full vowel
M= 0.1241, SD= 0.0007
longer in sycope environment
M= 0.1639, SD= 0.0016   t(88)= 6.1061, p<0.01
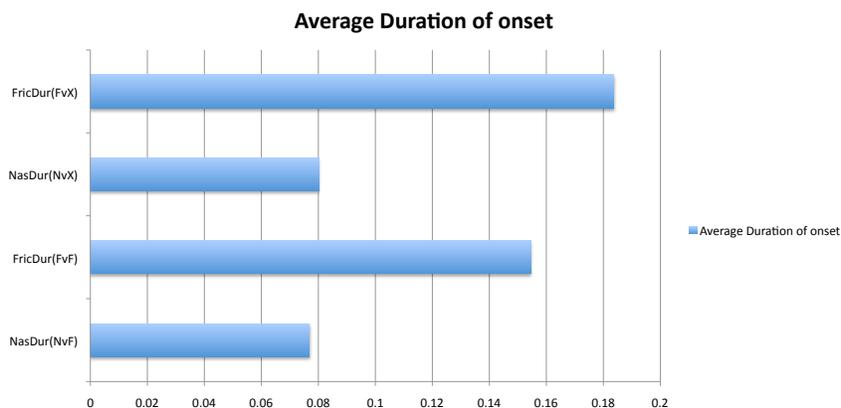
Duration of non-word-final nasals

Average duration of nasals

shorter before a full vowel
M=0.0234, SD=0.0000
longer in sycope environment
M= 0.0628, SD= 0.0005   t(103)= 4.1578, p<0.01

No interaction (onsets/codas)

Average Duration of onset

Conclusions

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

No Syncope	Syncope
CV or VC	C:
	pʰ, ṇ ʃ:

- 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 [ˈkaːn̩tʃiː] 'sweater'
  - nishikî [n̩ˈʃikiː] 'my skin'

True CL vs. East Cree

- True CL
  - pat —> paa
  - paa.ta —> pat.ta
- East Cree
  - ti.ni —> tn̩
  - ni.ti —> n̩ti

Summary / Interpretation

Observation	Interpretation
Complementary distribution of C length and full Vs	conditions for syncope include phonological environment (metrically strong / weak position)
No differences in syllable length	syllable nuclei unaffected by the process (not deleted)
Adjacent Cs lengthen, regardless of syllable position	phonetic process
Optionality, gradiency	phonetic process

Conclusions

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

Acknowledgements

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