

SYLLABIFICATION AND BLACKFOOT “S”
 By: Donald Derrick

MAIN CLAIM

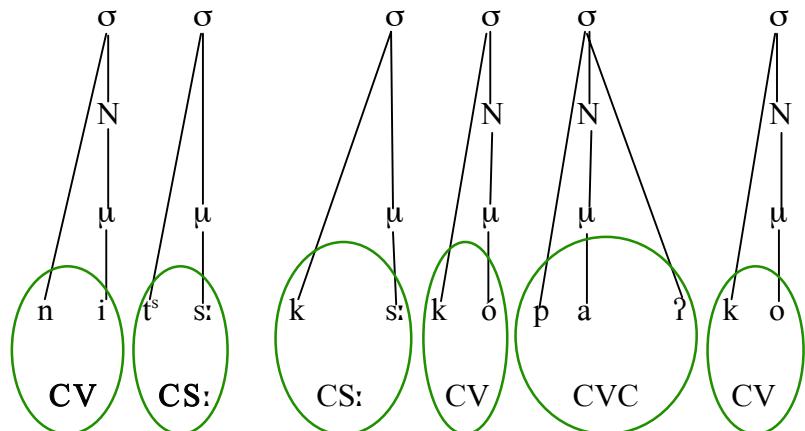
- Blackfoot has a syllabic ‘s’:
 (i.e., ‘s’ sometimes acts like a vowel)

EVIDENCE FOR THIS CLAIM:

- If 's' is syllabic, then the syllabification system of Blackfoot is maximally simple:

EXAMPLE 1: WITH SYLLABIC /S/

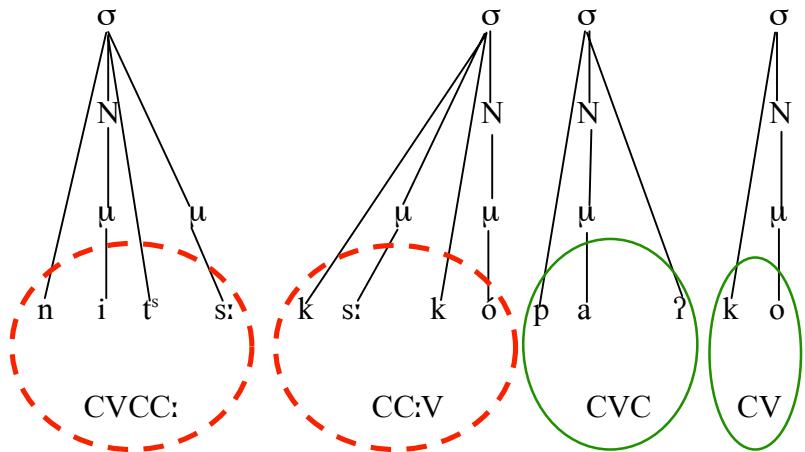
nitsssksskópa'ko
 [nit's:ks:kópa?ko]
 nit-i-tssksskópa'-ok-a
 1PS-VERB-watch-INV-3PS
 “she left me to watch”
 (F&R 1995:226)
 (BB 06/03/16)



- If 's' were not syllabic, then the syllabification system of Blackfoot is very complicated:

EXAMPLE 2: WITHOUT SYLLABIC /S/

nitssksskópa'ko
 [nit's:ks:kópa?ko]
 nit-i-tssksskópa'-ok-a
 1PS-VERB-watch-INV-3PS
 “she left me to watch”
 (F&R 1995:226)
 (BB 06/03/16)



1 OUTLINE

- § 2 Background on Blackfoot
- § 3 Phonemic Inventory
- § 4 Syllabification without s
- § 5 Syllabification With /s/
- § 6 Syllabification System I: Syllables with syllabic /s/
- § 7 Syllabification System II: Syllables Without Syllabic /s/
- § 8 Discussion
- § 9 Summary and Conclusion

2 BACKGROUND ON BLACKFOOT

- Blackfoot: Algonquian language with 8000 speakers.
- Four Dialects in southern Alberta and northern Montana (NLA, 2006, Frantz, 2006).
- This analysis is based on the Blood dialect.

3 PHONEMIC INVENTORY

3.1 VOWEL INVENTORY

- Three underlying vowels, i,a,o (And possibly u [Taylor, 1969]) contrast short and long.
- Other vowels are predictable (Elfner 2005, Frantz 1991, F&R 1995, Taylor 1969).

3.2 CONSONANT INVENTORY

- My transcriptions use the vowel devoicing marker [.] to indicate the back fricative (Frantz, 1991) or pre-aspiration (Reis-Silva, 2006).

Table 2: Phonetic Consonant Inventory of Blackfoot

	Labial	Alveolar	Palatal	Velar	Glottal
Stops	p p:	t t:		k k:	?
Fricatives		s s:			
Affricates		t ^s t: ^s		k ^s k: ^s	
Nasals	m m:	n n:			
Glides	w		j		

(Elfner, 2005)

4 SYLLABIFICATION WITHOUT S

4.1 WORD EDGE PHONOTACTICS

4.1.1 WORD ONSET

- Blackfoot words begin with one and only one short consonant {p,t,k,m,n}.

4.1.2 WORD CODAS

- Typically, Blackfoot words end in vowels or geminates.
- The possible singleton consonant word codas include {p,t,k,m,n,?}.
- Words may end with nasal geminates.

4.1.3 NUCLEUS

- Blackfoot allows short, long, and long diphthong vowels as a syllable nucleus:

FIGURE 1: VOWEL NUCLEUS SYLLABLE WITHOUT A GEMINATE CODA

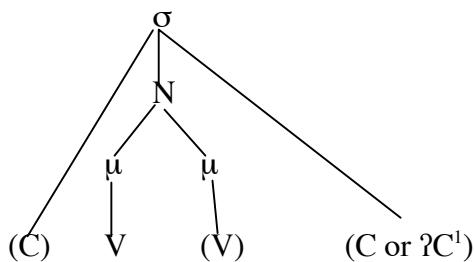


FIGURE 2: VOWEL NUCLEUS SYLLABLES WITH A GEMINATE CODA

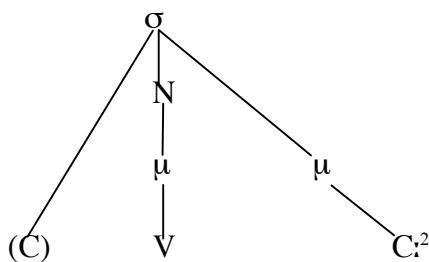
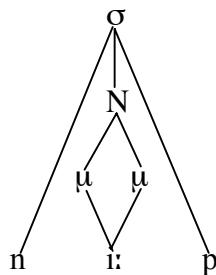
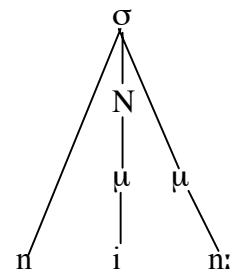


FIGURE 3: EXAMPLES OF SIMPLE SYLLABLES

niip
 [ni:p]
 niip
 leaf
 “leaf”
 (F&R 1995:133)
 (BB 05/10/12)



ninn
 [nɪn:]
 n-inn
 1POSS-father
 “father”
 (F&R 1995:61)
 (BB 05/10/12)



4.2 INTERVOCALIC PHONOTACTICS

- Intervocalic phonotactics are slightly more restrictive.

4.2.1 VENNEMANN’S LAWS (Vennemann 1988, Elfner 2004)

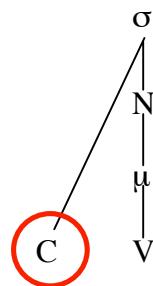
4.2.1.1 VENNEMANN’S HEAD LAW

- The ‘best’ syllables have simple onsets

¹ The onset is one of {p,t,k,m,n,?} and the coda is one of {p,t,k,m,n,?C}.

² The coda is one of {m:,n:} word finally and {m:,n:,p:,t,k:} word interally.

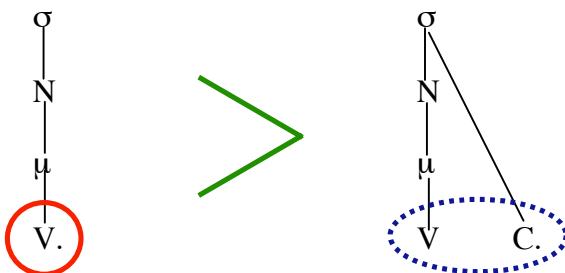
FIGURE 4: HEAD LAW



4.2.1.2 VENNEMANN'S CODA LAW

- The ‘best’ syllables have no coda, next best have simple codas.

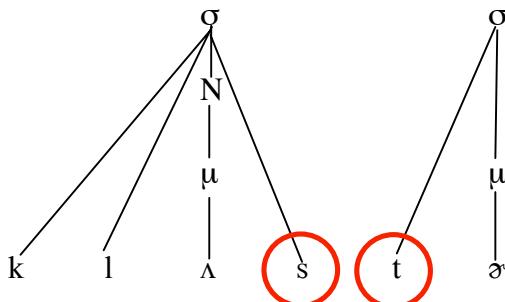
FIGURE 5: CODA LAW



4.2.1.3 VENNEMANN'S CONTACT LAW

- Where VC.CV, C1 > sonorous than C2
- i.e. “cluster” where the “s” is more sonorous than the “t”

FIGURE 6: CONTACT LAW



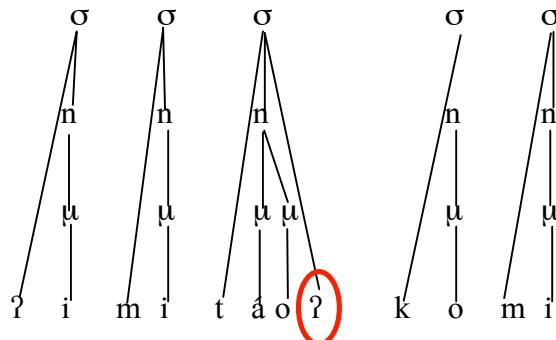
4.2.2 RESULT: ONLY TWO WITHIN WORD SYLLABLE CODAS

- There are no stops clusters in Blackfoot (F&R 1995)
- glides only separate two vowels (Elfner, 2004)
- No nasal + stop or stop + nasal sequences (F&R 1995).
- Therefore only two intervocalic codas in Blackfoot

4.2.2.1 GLOTTAL STOP CODAS

FIGURE 7: ? CODAS

imitáó'komi
 [?imitáó?komi]
 imitá-o'komi
 doghave lice
 “flea”
 (F&R 1995:56)
 (BB 05/10/12)

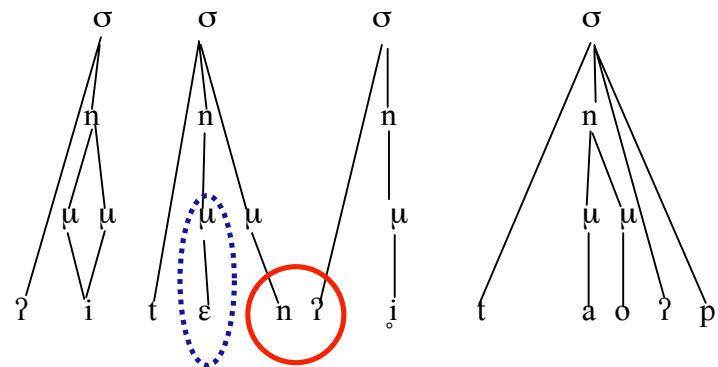


4.2.2.2 NASAL CODAS

- Nasal + voiceless vowels are separated by an epenthetic ?, creating nasal codas

FIGURE 8: NASAL CODAS

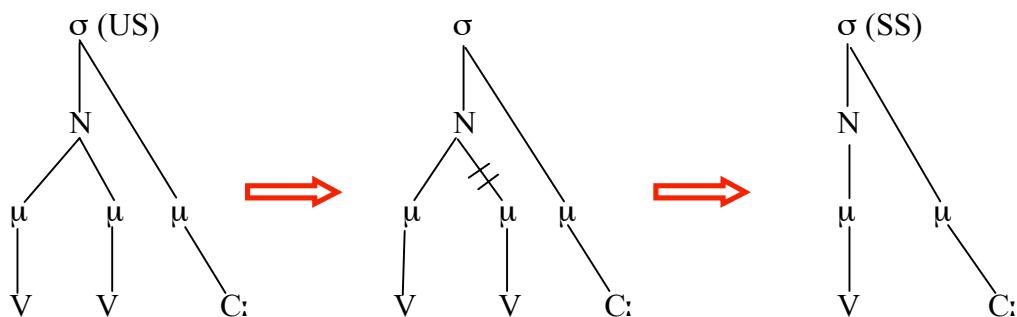
iitainnihtao'p
 [?i:tén?ítao?p]
 iit-a-inn-ihta(ki)-o'p
 where-DUR-boil-place-IOBJ
 “cooking pot”
 (F&R 1995:29)
 (BB 05/10/18)



4.2.3 MAX 2 MORAS PER SYLLABLE

- Long vowels and diphthongs shorten and short vowels become lax when followed by geminates (see figure 8 syllable 2 above)

FIGURE 9: GEMINATES SHORTEN LONG VOWELS



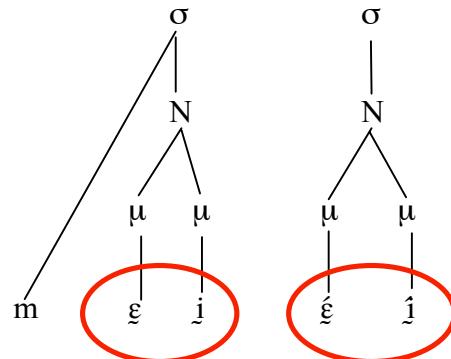
- The features of the delinked V delete or merge with the preceding V (Elfner, 2005).

4.2.4 ONSETLESS SYLLABLES

- Long sequences of vowels lead to onsetless syllables

FIGURE 10: ONSETLESS SYLLABLES

maaái
 [mɛi̥éi̥]
 m-aaái
 UPOSS-robe
 “robe”
 (F&R 1995:121)
 (BB 06/02/01)



5 SYLLABIFICATION WITH /S/

- There are 5 kinds of /s/ sounds in Blackfoot: 1) assibilants, 2) affricates, 3) singleton /s/, 4) geminate /s/, and 5) syllabic /s/.

5.1 ASSIBILANTS

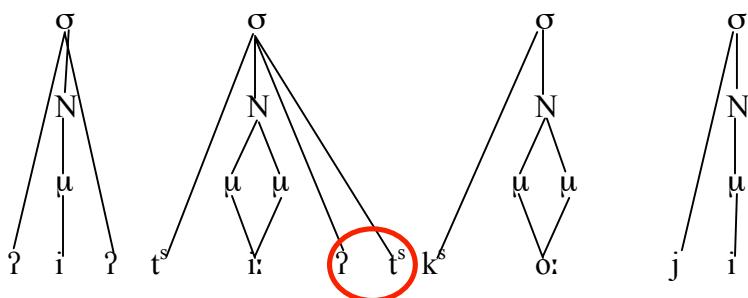
- In Blackfoot, /t/ becomes /t^s/ before all /i/s, and /k/ becomes /k^s/ before most /i/s heteromorphologically (Armoskaite & Chávez 2005).
- In citation speech, they are about half the duration of a singleton /s/ in onset position (Derrick, 2006b).
- Because assibilation requires the context of a high front vowel, assibilants are all onsets.

5.2 AFFRICATES

- Singleton Affricates occur word-initially, word-finally, and word-internally in onsets or codas.
- The most complex example is “picnic”

FIGURE 11: GLOTTAL STOP + AFFRICATE

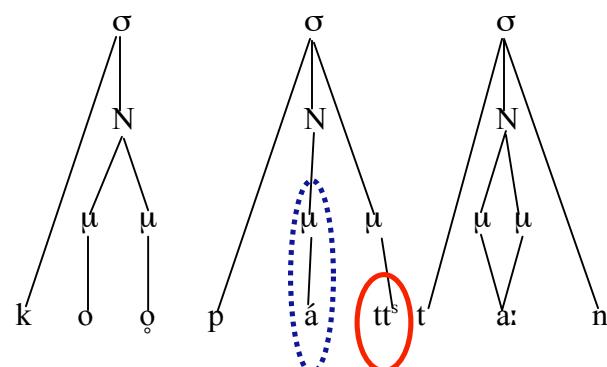
i'tsii'tskoooyi
 [ʔi?t^si?t^sk^soɔjɪ]
 itsi-i'tsk-ooyi
 pretty-bare-eat
 “picnic”
 (F&R 1995:110)
 (BB 06/02/09)



5.2.1 WORD INTERNAL GEMINATE AFFRICATES

FIGURE 12: GEMINATE AFFRICATE + CONSONANT

koohpááttstaan
 [koopá:t^sta:n]
 koohpááttstaan
 yeast bread
 “yeast bread”
 (F&R 1995)
 (BB 05/11/29)

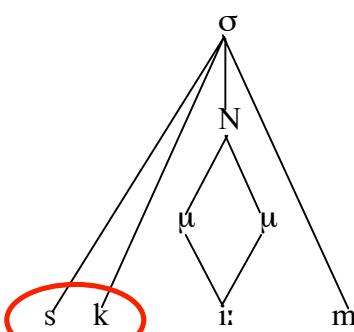


5.3 SINGLETON /s/

- Blackfoot singleton /s/ can form simple onsets.
- Blackfoot /s/ in onset position may also be part of complex /s/ + {p,t,k} onsets.

FIGURE 13: WORD-INITIAL COMPLEX ONSET

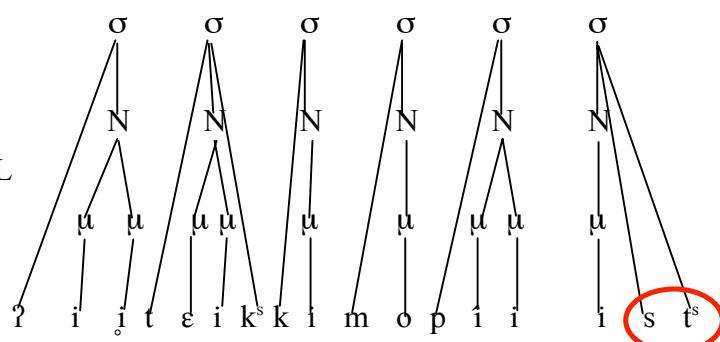
skiim
 [ski:m]
 skiim
 female animal
 “female animal”
 (F&R 1995:214)
 (BB 06/02/09)



5.3.1 WORD EDGE /s/ SUPPORTS COMPLEX CODAS

FIGURE 14: WORD-FINAL COMPLEX CODA

iihtaikskimopíists
 [?iit̚eik^skimo:píists]³
 iiht-a-iks-kimopi-ists
 LNK-DUR-INT-place of honour-IPL
 “Hunting Equipment”
 (BB 05/10/18)

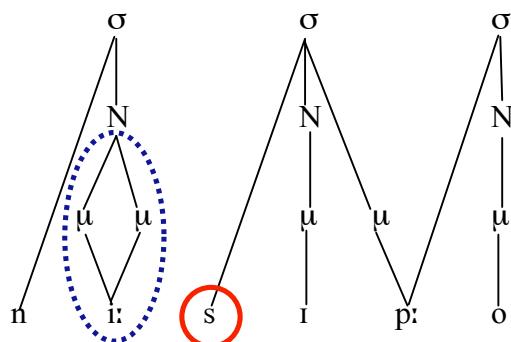


³ I am not sure why this is a super-long /i/, but multiple tokens produced the same results, so I have transcribed those results and represent them in the syllabification analysis.

5.3.2 SINGLETON /S/ AS ONSET

FIGURE 15: WORD-INTERNAL SINGLETON /S/ ONSET

niisippo
 [ni:sip:o]
 niis-(k)iipo
 four-ten
 “forty”
 (F&R 1995:134)
 (BB 05/10/12)

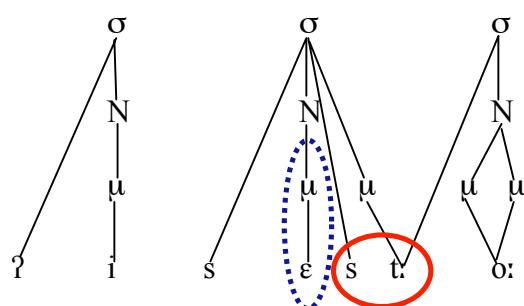


5.3.3 SINGLETON /S/ WORD INTERNAL CODA

- Short affricate-like duration (Derrick, 2006b).
- But /s/ segment blocks OCP effects allowing the formation of /k^s/ assibilations (Chávez-Péón, 2006).
- Does not prevent the vowel-shortening effects of a following geminate:

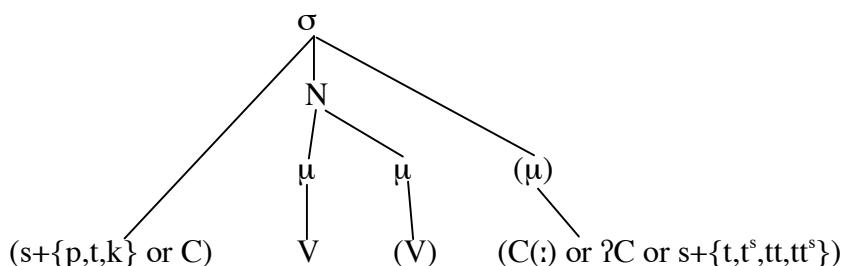
FIGURE 16: SINGLETON /S/ + GEMINATE

isaisttoo
 [?isest:o:]
 i-saistt-oo
 VERB-shout-go
 “announce”
 (F&R 1995:198)
 (BB 06/02/09)



5.3.4 SINGLETON /S/ ADDS COMPLEXITY

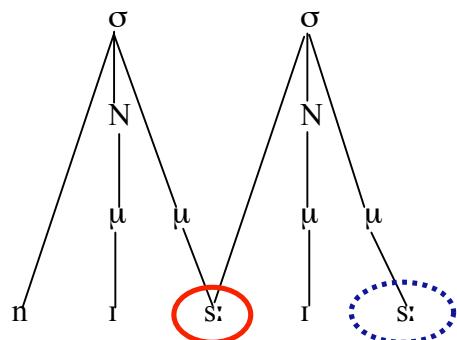
FIGURE 17: SYLLABLES WITH COMPLEX WORD-EDGES



5.4 GEMINATE /S/

FIGURE 18: GEMINATE /S/ + VOWEL

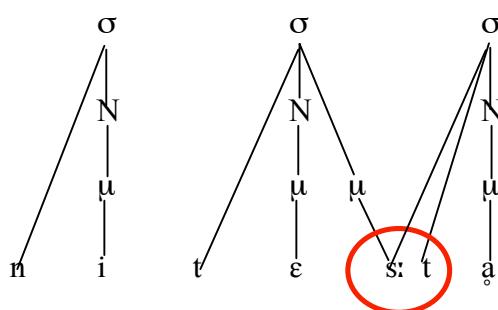
nississ
 [nis:i:s:]
 n-ississ
 my-young sib of female
 “younger sibling of a female”
 (F&R 1995:85)
 (BB 06/02/01)



5.4.1 GEMINATE /S/ AND COMPLEX ONSETS

FIGURE 19: GEMINATE /S/ + CONSONANT

nitaisssta
 [nites:tɑ̃]
 nit-a-i-sstaa
 I-DUR-VERB-sucking milk
 “I am sucking milk”
 (F&R 1995:228)
 (BB 06/03/02)



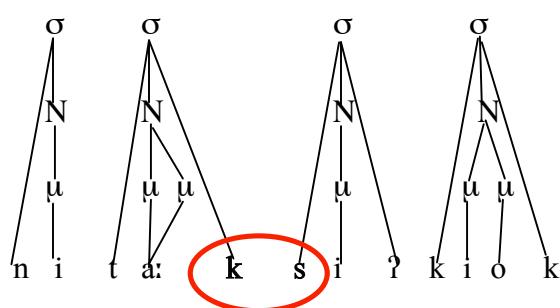
5.5 SYLLABIC /S/

- Long /s/ can also occur after stop consonants, and I analyze these as syllabic /s/.

5.5.1 COMPARING GEMINATE /S/ AND SYLLABIC /S/

FIGURE 20: STOP + SINGLETON /S/

nitaaksi'kiok
 [nita:ksɪ?kiok]
 nit-aak-si'ki-ok
 1PS-FUT-cover/tame-INV
 “he will tame me”
 (BB 06/03/16)

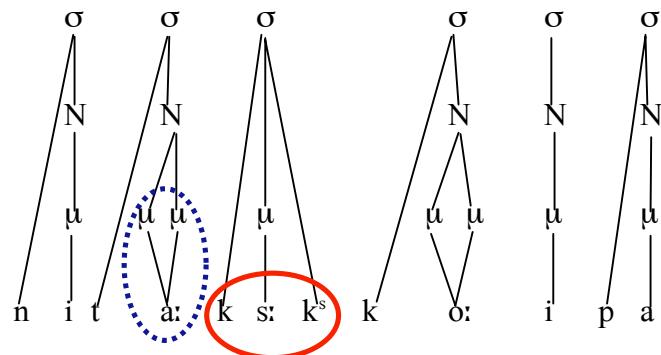


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38th Algonquian Conference, Vancouver, UBC

- The long /s/ forms its own syllable.

FIGURE 21: STOP + LONG /S/ = SYLLABIC /S/

nitaaksskskooipa
[nita:ksk^skooipa]
nit-aak-sskskaa-ip-a
1PS-DUR-VERB-measure-move-3PS
“I will measure (it)”
(F&R 1995:225)
(BB 06/03/16)

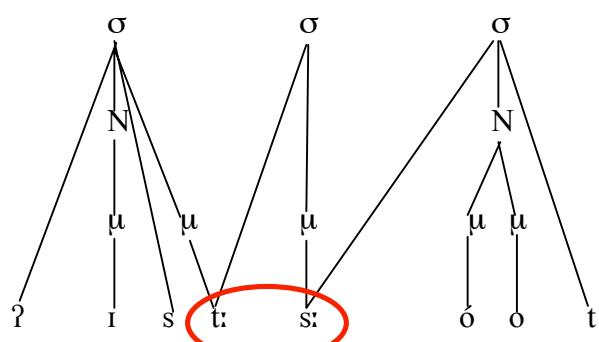


5.5.2 SYLLABIC ‘S’ WITH A GEMINATE ONSET

- Syllabic ‘s’ forms onset to otherwise onsetless syllable

FIGURE 22: GEMINATE + SYLLABIC /S/

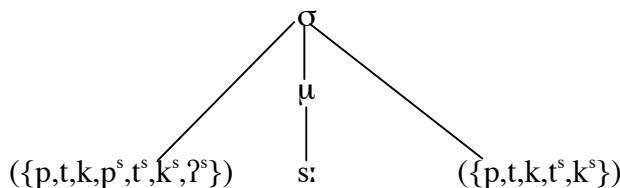
isttssóot
[?ist:s:óot]
i-sttssi-oo-t
VERB-in the forest-go-CMD
“forest”
(F&R 1995:97)
(BB 05/11/23)



- For an alternate analysis that suggests the long /s/ loses its mora and incorporates it into the onset of the following syllable, see Elfner (2005).
- This analysis may be correct with certain speakers or dialects in the case of long /s/ followed by vowels.
- The ambiguity is similar to that of the word “cuddly” in English - is it 2 or three syllables?

6 SYLLABLES WITH SYLLABIC /S/

FIGURE 23: SYLLABIC /S/ SYLLABLES



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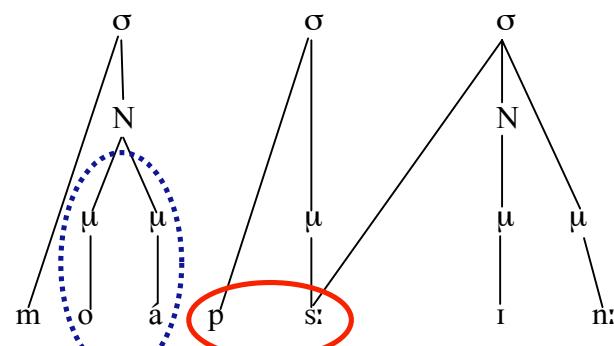
6.1 THE ONLY LONG CONSONANT TO FOLLOW A GLOTTAL STOP IS LONG /S/.

- However, syllabic /s/ is not a coda to a preceding vowel and so may follow a /ʔ/ as in the word *awóí'sstaakssin* [awóíʔs:ta:kss:in]⁴ or “cross” (F&R, 1995).

6.2 LONG VOWELS STAY LONG WHEN FOLLOWED BY SYLLABIC /S/

FIGURE 24: SYLLABIC /S/ ≠ GEMINATE /S/

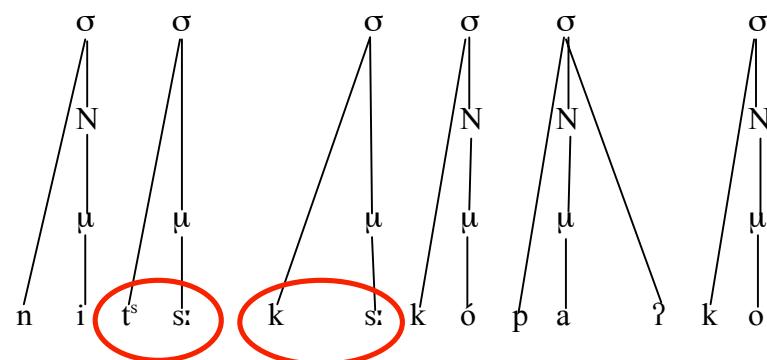
moápsspinn
[moáps:in:]
m-oápssinn
body part-eye
“eye”
(F&R 1995:128)
(BB 06/02/09)



6.3 BLACKFOOT ALLOWS STRINGS OF TWO SYLLABIC /S/S IN A ROW

FIGURE 25: WITH SYLLABIC /S/

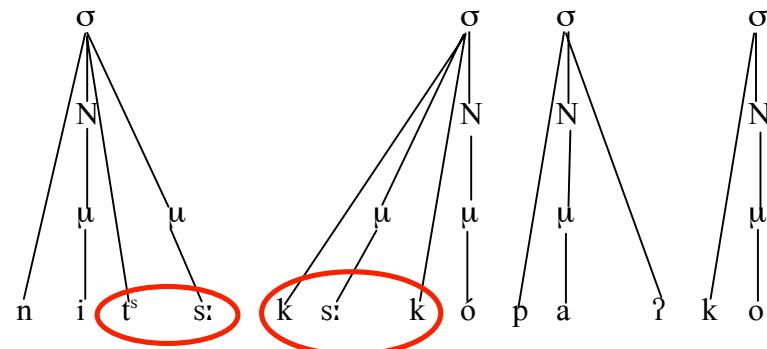
nitssksskópa'ko
[nit's:ks:kópa?ko]
nit-i-tssksskópa'-ok-a
1PS-VERB-watch-INV-3PS
“she left me to watch”
(F&R 1995:226)
(BB 06/03/16)



7 SYLLABLES WITHOUT SYLLABIC /S/

FIGURE 26: WITHOUT SYLLABIC /S/

nitssksskópa'ko
[nit's:ks:kópa?ko]
nit-i-tssksskópa'-ok-a
1PS-VERB-watch-INV-3PS
“she left me to watch”
(F&R 1995:226)
(BB 06/03/16)

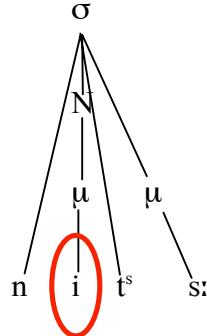


⁴ Predicted output. Elicitation scheduled for summer, 2006.

7.1 WHY THE ALTERNATE ANALYSIS DOES NOT WORK

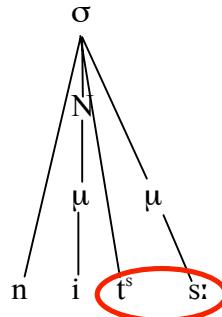
7.1.1 THE LONG /S/ DOES NOT REDUCE THE PRECEDING HIGH FRONT VOWEL /I/ TO LAX /ɪ/

FIGURE 27: LONG /S/ NOT ACTING LIKE GEMINATE /S/



7.1.2 THE ORDER OF THE CODA CONSONANTS VIOLATES VENNEMANN'S CODA LAW

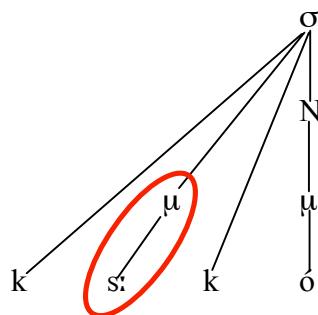
FIGURE 28: VIOLATE CODA LAW



7.1.3 THE NEXT SYLLABLE STARTS WITH /K/, BUT THE ONSET CONTAINS A LONG /S/

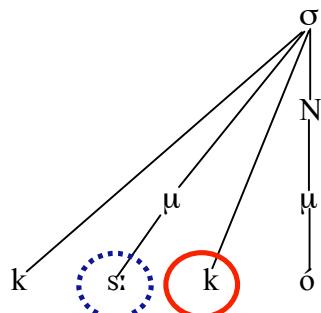
- This /s/, as an onset, would lose its mora (duration) - it does not in Blackfoot.

FIGURE 29: UNDERLYING ONSET LONG /S/ NOT LOSING DURATION



7.1.4 THE NEXT /K/ VIOLATES VENNEMANN'S ONSET LAW

FIGURE 30: SECOND /K/ VIOLATES ONSET LAW



7.2 EXTRASYLLABICITY

- Words may have extrasyllabic word edges - but words that have syllables will not have syllabified edges and extrasyllabic word centers.

7.3 CONSULTANT SUPPORT

- Consonant bounded long /s/s are always their own syllable or “clapping unit”.
- Our consultant will spontaneously break words into syllables in order to teach Blackfoot students how to say long and complex words.

8 DISCUSSION

8.1 BLACKFOOT SYLLABLES

FIGURE 31: V NUCLEUS, NO GEMINATE IN CODA

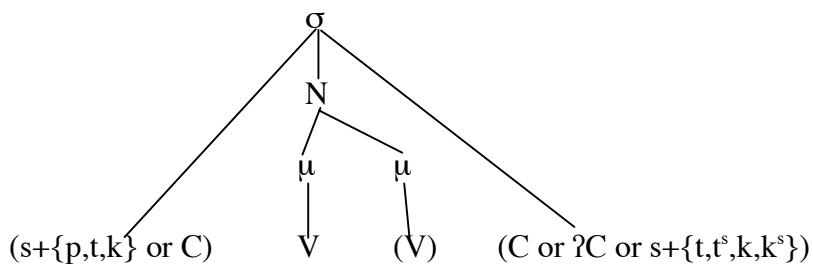


FIGURE 32: V NUCLEUS, GEMINATE IN CODA

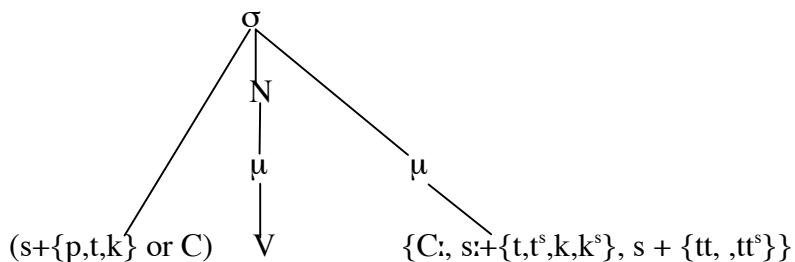
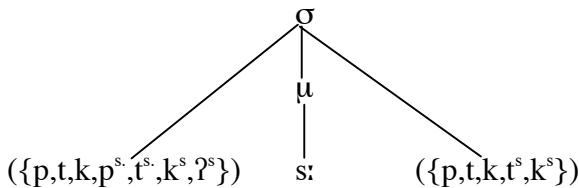


FIGURE 33: S NUCLEUS



- Syllabic /s/ has obligatory onsets within words

8.2 PREDICTIVE POWER

- The above syllable analysis, combined with Vennemann's syllable laws, is highly predictive of Blackfoot syllable structure.
- But they alone cannot exclude {m,n} codas followed by {p,t,k,s} onsets - none of which occur in Blackfoot.
- Blackfoot has no recorded examples of syllabic nasals (Frantz 1991, 1995; Elfner 2004).
- If this analysis of syllabification is correct, a universal sonority hierarchy simply does not help in identifying possible syllabic consonants.

9 SUMMARY AND CONCLUSION

- By proposing a syllabic /s/, it is almost possible to keep the same simple syllable system, adding only a few possible complex codas and onsets.
- Vowel nucleus syllables maximally contain an optional simple or s+{p,t,k} onset, a nucleus with a short or long vowel, and an optional coda which may contain one short or long consonant, a glottal stop + singleton consonant or an s + {t,tt,t^s,tt^s,k,k^s} (/s/ may be geminate if the stop/affricate is not) coda.
- Syllabic /s/ nucleus syllables maximally have a {p,t,k,ʔ,t^s,k^s,p^s,ʔ^s} onset, and a {p,t,k,t^s,k^s} coda.
- This analysis rejects the validity of the sonority scale for identifying syllable nuclei.

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