Voiceless Words in Bella Coola: Fact vs. Fiction

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Abstract: A few assertions made by Gloria Mellesmoen (2021) in an Optimality Theory-based article on obstruent clustering in Bella Coola (*Nuχalk*) are disputed. At issue are: (i) failure to cite all-stop and all-fricative words; (ii) exclusion of stops as potential nuclei and ambiguous views on the status of affricates; (iii) absence of a procedure to determine nuclearity of fricatives in certain environments. It is also shown that (iv) obstruent clustering is an areal trait shared with Rivers Inlet (*Oowekyala*). Agreeing with Newman (1947), I maintain that Bella Coola is non-syllabic.

Keywords: Bella Coola, syllabicity, Good Enough Nucleus Hypothesis, diachrony, areal features

1   Introduction

The oldest written record of the Bella Coola (*Nuχalk*) language was created in late July 1793, when Alexander Mackenzie logged 22 native words (identified in Nater 2020) while exploring the Bella Coola valley (Mackenzie 1801:356–376). Mackenzie was, of course, familiar with /χ/ in most instances, but he had a difficult time with other obstruents and consonant clusters, inserting vowels where none actually existed, e.g., <Zim**i**lk> = *smɬk* 'fish', <Kiet**i**s> = *χic'* 'axe', <Cloug**u**s> = *qluq's* 'eye', <**Di**chts> = *t'χts* '(it is a) stone' (Nater 2020:187). Over a century later, Franz Boas, who had earlier cited <*t'χt*> = *t'χt* 'stone' and <*χ̓q*> = *ɬkʷ'* 'big' (Boas 1886:204–205), submitted a paper on voiceless words. But "common sense" still prevailed:

> This language was the subject of a paper by Boas half a century ago, which is said to have been rejected by the editor of a German philologic journal on the grounds that, as "everyone knows," it is impossible to have words without vowels.
>
> (Hockett 1955:57)

Post-Boas, Bella Coola obstruent clusters and all-obstruent words continued to challenge scholars: Newman (1947), Hockett (1955), Bagemihl (1991, 2011), Cook (1994), to name a few. A more recent approach is adopted by Mellesmoen (2021), who adheres to a "Good Enough Nucleus Hypothesis" (hereafter GENH) while deliberating nuclear potential for Bella Coola fricatives:

> Every word has at least one syllable, and in words with a single syllable, anything equal or greater in sonority to a fricative may be in the nuclear position.
>
> (Mellesmoen 2021:228)

However, in regards to syllabication, this statement does no justice to voiceless words that contain, or consist of, two or more consecutive fricatives. Also, the mandate that stops cannot be nuclear (Mellesmoen 2021:231–232) conflicts with the presence of numerous all-stop words and roots, and violates the rule whereby "every word has at least one syllable".

In this paper, then, I aim to prove that it is not always feasible to bring unusual linguistic traits in line with currently acceptable theories on alleged linguistic universals. First, the Bella Coola phoneme inventory (and a phantom schwa) are dealt with, and two-member voiceless clusters are identified and categorized. Next, I present lists of voiceless stems and roots, and point out the basic

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flaws of GENH. I then show that presence of long obstruent clusters is shared with Oowekyala (although these languages differ substantially on the phonotactic level). I conclude that Bella Coola is essentially non-syllabic. Topics are treated in the following order: phonemes and phonotactics (Section 2); supporting data (Section 3); area and diachrony (Section 4); conclusions (Section 5).

2   Phonemes and phonotactics

The phonemes of Bella Coola are as shown in Table 1 below. Per centum distribution of phonemes across the entire morpheme inventory (see Nater 1984:27) is indicated in parentheses. Note, in particular, the high numbers for /s, ł, i, u, a/ vs. the very low frequency of /h/, and the prevalence of fricatives and sonorants over stops (plosives). Aspiration of /p/ and /t/, and affrication of all back plain stops, in non-prevocalic environments are treated in Nater (1984:4). Note that /p', t', q', etc./ = /ṗ, ṫ, q̇, etc./; /kʷ', qʷ'/ = /k̇ʷ, q̇ʷ/; #'R = #ʔR (where # = continuant or morpheme boundary, R = sonorant); /ł/ = /ɬ/; /χ/ = /x̌/; /χʷ/ = /x̌ʷ/.

Mellesmoen's addition of /ə/ (2021:228) is baseless, as schwa is not distinctive in Bella Coola. It appears (i) predictably in sonorant clusters and XṆX, (ii) marginally in PNV, and (iii) never in SNV (Nater 1984:7–14).[1] Thus, we note that /ə/ is in the underlined PNV sequence of </pkəmk̲ə̲mi/ 'mosquito (DIM)'> not just "quite reduced" (Mellesmoen 2021:233, fn. 7), but clearly absent: one hears […c'ʔm̥ẹ] (rather than *[…c'ɪ̆mẹ]), where glottal release coincides with onset [lip closure] of [m].

Table 1: Bella Coola phoneme inventory

| | | OBSTRUENT | | | SONORANT | |
| | | PLOSIVE | | | | |
		PLAIN	EJECTIVE	FRICATIVE	CONSONANTAL	VOCALIC
FRONT	LABIAL	/p/ (2.68)	/p'/ (0.56)		/m/ (3.18)	/m̥/ (1.81)
	DENTAL	/t/ (4.75)	/t'/ (1.04)		/n/ (3.99)	/n̥/ (0.92)
	ALVEOLAR	/c/ (3.01)	/c'/ (1.78)	/s/ (8.13)		
	LATERAL		/ƛ'/ (0.95)	/ł/ (4.75)	/l/ (3.97)	/l̥/ (0.85)
BACK	PALATAL	/k/ (2.39)	/k'/ (1.48)	/x/ (1.65)	/y/ (2.45)	/i/ (8.12)
	UVULAR	/q/ (1.61)	/q'/ (1.38)	/χ/ (2.58)		
	VELAR ROUNDED	/kʷ/ (1.67)	/kʷ'/ (0.86)	/xʷ/ (1.17)	/w/ (1.86)	/u/ (6.49)
	UVULAR ROUNDED	/qʷ/ (1.24)	/qʷ'/ (1.02)	/χʷ/ (1.44)		
LARYNGAL		/'/ [ʔ] (4.20)			/h/ [ɦ] (0.16)	/a/ (15.84)
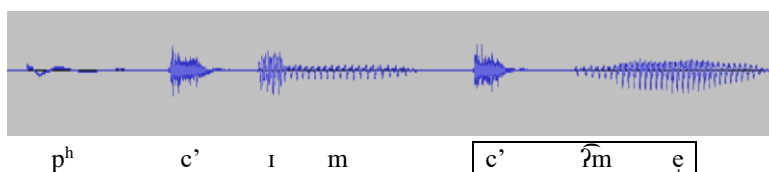
Figure 1: Spectrogram of *pk'm̥k'mi* [pʰc'ɪmc'ʔ͡mẹ] 'small mosquito' (FirstVoices, Audiotonic)

[1] P = any stop but /c/, N = front sonorant, S = /c/ or fricative, V = vocalic R, X = obstruent or word boundary.

In order to give the reader an idea of the settings in which voiceless clusters exist, I list two-member clusters in charts based on Nater (1984:22–23). Coding and patterns are as follows: (i) cells that would have accommodated avoided clusters (Nater 1984:22–23) are greyed out; (ii) unpredictable absence is marked as ——; (iii) exceptional (hypothetically avoided) sequences are boxed; (iv) clusters found only in words containing one or more vocalic sonorants are preceded by an asterisk; (v) {homorganic front stops} and {front stop + ejective front stop} clusters are avoided:

Table 2: Front+front voiceless clusters

	–p	–p’	–t	–t’	–c	–c’	–s	–ƛ’	–ł
p–			pt		*pc		ps		pł
p’–			*p’t		p’c		p’s		p’ł
t–	tp				tc		*ts		tł
t’–	*t’p				t’c		t’s		——
c–	cp		ct				cs		cł
c’–	c’p		*c’t				c’s		c’ł
s–	*sp	sp’	st	*st’	sc	sc’	*ss	sƛ’	sł
ƛ’–	ƛ’p		*ƛ’t		——		*ƛ’s		ƛ’ł
ł–	łp	łp’	łt	łt’	*łc	łc’	——	——	łł

(vi) {back stop, /x/, /χʷ/ + ejective front stop} clusters, except {/q/ + ejective front stop} and boxed clusters,[2] are avoided:

Table 3: Back+front voiceless clusters

	–p	–p’	–t	–t’	–c	–c’	–s	–ƛ’	–ł
k–	kp		kt		*kc		ks	*kƛ’	kł
k’–	*k’p		*k’t		k’c		k’s		k’ł
x–	xp		*xt		*xc	*xc’	xs		xł
q–	qp	*qp’	*qt	qt’	qc	qc’	*qs	qƛ’	qł
q’–	q’p		*q’t		*q’c		q’s		q’ł
χ–	χp	χp’	χt	*χt’	χc	*χc’	χs	χƛ’	χł
kʷ–	kʷp		*kʷt		*kʷc	kʷc’	kʷs	kʷƛ’	kʷł
kʷ’–	kʷ’p		*kʷ’t		——		kʷ’s		kʷ’ł
xʷ–	xʷp	xʷp’	*xʷt	xʷt’	xʷc	xʷc’	*xʷs	xʷƛ’	*xʷł
qʷ–	——		qʷt		*qʷc		qʷs		qʷł
qʷ’–	qʷ’p		——		——		qʷ’s		qʷ’ł
χʷ–	——		χʷt		*χʷc		χʷs		χʷł

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[2] Found in *kƛ’i* ‘short’, *’Ayxc’mqa* ‘a woman’s name’, *skʷc’* ‘wrinkled’, *kʷƛ’* (tr.) ‘put in place’.

(vii) {ejective + ejective} and {/p'/ + back obstruent} clusters except /p'x/ and /p'χʷ/[3] are avoided:

Table 4: Front+back voiceless clusters

	–k	–k'	–x	–q	–q'	–χ	–kʷ	–kʷ'	–xʷ	–qʷ	–qʷ'	–χʷ
p–	*pk	*pk'	px	*pq	*pq'	*pχ	*pkʷ	—	*pxʷ	—	pqʷ'	—
p'–			p'x									p'χʷ
t–	*tk	tk'	tx	*tq	tq'	tχ	tkʷ	tkʷ'	txʷ	tqʷ	tqʷ'	*tχʷ
t'–	*t'k		—	t'q		t'χ	t'kʷ		t'xʷ	*t'qʷ		*t'χʷ
c–	*ck	ck'	*cx	cq	cq'	cχ	ckʷ	*ckʷ'	cxʷ	cqʷ	—	*cχʷ
c'–	c'k		*c'x	c'q		c'χ	*c'kʷ		*c'xʷ	*c'qʷ		c'χʷ
s–	sk	sk'	sx	sq	sq'	sχ	skʷ	skʷ'	sxʷ	sqʷ	sqʷ'	*sχʷ
ƛ'–	*ƛ'k		—	ƛ'q		ƛ'χ	ƛ'kʷ		ƛ'xʷ	—		*ƛ'χʷ
ł–	*łk	łk'	łx	łq	łq'	łχ	łkʷ	łkʷ'	łxʷ	*łqʷ	łqʷ'	łχʷ

(viii) back + back obstruent clusters except *xkʷ', χkʷ, kʷ'qʷ* are homorganic, while {back stop + back stop}, {/xʷ/, /χʷ/ + back obstruent} and {/x/ + back obstruent except /kʷ'/} clusters are avoided:[4]

Table 5: Back + back voiceless clusters

	–x	–q	–q'	–χ	–kʷ	–kʷ'	–xʷ	–qʷ	–χʷ
k–	kx								
k'–	k'x								
x–						*xkʷ'			
q–				*qχ					
q'–				q'χ					
χ–		*χq	*χq'	*χχ	*χkʷ			*χqʷ	*χχʷ
kʷ–							kʷxʷ		
kʷ'–							kʷ'xʷ	*kʷ'qʷ	
qʷ'–									qʷ'χʷ

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[3] The two exceptions are *p'x* 'crabapple' and *p'χʷłt* 'bunchberry'. *p'x* has no known etymology, while *p'χʷłt* (dissimilated */p'χʷ-łp/?) may be a blend of older **p'uqʷ(ay)* 'a shrub' (Kuipers 2002:81) and Kwakwala √ṕqʷ 'to be flat on s.th.' (Lincoln & Rath 1980:69) and/or Heiltsuk √pḣx̌ʷ 'to change colours (in the fall)' (Lincoln & Rath 1980:70).

[4] Rows and colums that accomodate non-existent clusters only are excluded in Table 5. *xkʷ', χkʷ, kʷ'qʷ* are unique clusters found in resp. *s'ixkʷ'xʷ* 'bushtail rat', *'awanaaχkʷ* 'raft', and *Kʷ'qʷla* 'Clayton Falls'. Of these, *s'ixkʷ'xʷ* is likely based on Proto-Salish **k̓'ʷaxʷ* 'rat, mouse' (Kuipers 2002:51), while the other two clearly have North Wakashan origins: Haisla *hawanàqiak̓ʷ* 'loaded on top (said of the canoes covered with boards)' (Lincoln & Rath 1986:121), resp. Heiltsuk √k̓ʷhq̓ʷ '?' (in *k̓ʷík̓ʷáqʷx̌ƛawa* 'lichen' (Lincoln & Rath 1980: 292)).

3 Supporting data

Data presented in sections 3.1 to 3.3 appear in a practical orthography in Nater (1990), where *ts* = /c/, *ts'* = /c'/, *lh* = /ɬ/, *tl'* = /ƛ'/, *c* = /x/, *cw* = /xʷ/, *x* = /χ/, *xw* = /χʷ/, *7* = /'/. Throughout sections 3.1 to 3.3, tr. = transitive verb.

3.1 Words and roots containing stops only

The data displayed further below contradict Mellesmoen's claim that there is only one all-stop root, viz √*tp* 'spotted' (which she, relying on 2021 FirstVoices data rather than Nater 1990, cites as a free form). Mellesmoen (2021:230) briefly ponders affricates as potential nuclei, but then imposes a restriction: "For a narrower scope …". Regardless, she does not abide by this restriction, having already decided that *tp* is the one and only all-stop word (Table 1 and comments thereafter). It is Mellesmoen's foregone conclusion that affricates (which she does not consider stops) are indeed potential nuclei, as implied by "Have a Fricative or an Affricate" in her Table 1. I quote:

> From a total of 1506 words on FirstVoices, there were only a total of 51 words that fit the definition of an OBSTRUENT-ONLY word. The break down is shown in Table 1.

Table 1: Count of OBSTRUENT-ONLY words on FirstVoices

		Words
Do Not Meet Criteria		1455
Meet the Criteria	Have a Fricative or an Affricate	45
	Only Stops	1
	Other	5

> […] This leaves a single obstruent-only word that is comprised only of stops (*tp* 'spotted'). […] While virtually every word in Bella Coola has at least one [+continuant] segment, and fricatives [*sic*] may be naturally paired with fricatives, rather than stops, this involves larger questions pertaining to the nature of affricates that are beyond the scope of the present paper. For a narrower scope and due to a small number of OBSTRUENT-ONLY words without fricatives, this paper focuses on fricatives as potential nuclei and leaves the investigation of affricates for future study. […] The distributional patterns described in Section 2.2 show that Bella Coola allows fricatives, but not stops, in a nuclear position.

> (Mellesmoen 2021:229–231)

Below, entries that contain none of the affricates /c/, /c'/, /ƛ'/ are rendered in boldface.

(1) ckʷ 'heavy'

(2) cp (tr.) 'wipe'

(3) cq (tr.) 'pierce'

(4) cq' (tr.) 'grab, pull, tear'

(5) cqʷ (tr.) 'start on something'

(6) c'k (tr.) 'fix, prepare'

(7) c'kt 'arrive'

(8) c'p 'stuck, blocked'

(9) kp 'each, all, every'

(10) k'c (tr.) 'chop, cut with axe'

(11) kʷƛ' (tr.) 'put in place'

(12) kʷ'p 'straight, right'

(13) kʷ'pt 'become waterlogged'

(14) ƛ'kʷ (tr.) 'gather (tiny objects)'

(15) √ƛ'q 'protrude'

(16) p'c (tr.) 'hold underwater'

(17) qc (tr.) 'pass on, transmit'

(18) qƛ' 'trip, stumble'

(19) √q'p 'dull'

(20) qʷt 'crooked'

(21) qʷ'p 'bare, empty'

(22ₐ) √tp (tr.) 'spread, stretch'

(22ᵇ)   √tp 'spotted'   **(23)**   tk' 'sticky'
(24)   tkʷ 'dirty'   **(25)**   tkʷ' (tr.) 'dig up'
(26)   tq' 'arrive by boat, land'   **(27)**   tqʷ' (tr.) 'remove fur from hide'
(28)   t'c (tr.) 'knock, strike, shatter'   **(29)**   t'kʷ 'bleed'
(30)   t'q (tr.) 'spread on surface'

3.2   Words and roots containing stop(s) and fricative(s)

It is the large inventory of voiceless Bella Coola words and roots containing at least one stop and one fricative that seems to have inspired GENH in the first place. However, making a GENH-based decision on syllabicity is problematic where two consecutive fricatives appear within a word, as marked in boldface below.

(31)   cɬ (tr.) 'pull, pluck'   (32)   cxʷ 'dark'
(33)   cχ (tr.) 'drip on'   (34)   c'ɬ (tr.) 'cover, shelter'
(35)   c's 'loud'   (36)   √c'χ 'true'
(37)   c'χʷ 'white'   (38)   kɬ (tr./itr.) 'fall, drop'
(39)   kɬx 'awake'   (40)   ks (tr.) 'pull'
(41)   kx (tr.) 'draw a line on something'   (42)   k'ɬt (tr.) 'brace, support'
(43)   k'x (tr./itr.) 'see, look at'   (44)   kʷɬ (tr.) 'crack, split'
(45)   kʷs 'rough'   (46)   kʷst 'body surface'
(47)   kʷxʷ (tr.) 'fit, match'   (48)   kʷ'ɬ (tr.) 'pour out, fill with water'
(49)   kʷ's 'engaged, be dating'   (50)   λ'ɬ 'dry'
(51)   √λ'χ 'rattle, crackle, sparkle'   (52)   ɬc' (tr.) 'hold or press down'
(53)   ɬk' (tr.) 'pull off'   (54)   ɬkʷ (tr.) 'pass one's hand through sth.'
(55)   ɬkʷ' 'big'   (56)   ɬp (tr.) 'fill up'
(57)   ɬq 'wet'   (58)   ɬq' (tr.) 'slap'
(59ᵃ)   ɬqʷ' (tr.) dig up, uproot'   (59ᵇ)   ɬqʷ' 'fade'
(59ᶜ)   √ɬqʷ' 'sob'   (60)   √ɬt (tr.) 'pry off, pull with hook'
(61)   ɬχʷt 'go through a passage'   (62)   pɬt 'thick'
(63)   ps (tr.) 'shape. mold'   **(64)   psx (tr.) 'train, educate'**
(65)   px (tr.) 'squeeze water out of string'   (66)   p'ɬt 'warm'
(67)   p's (tr.) 'bend'   (68)   p'x 'crabapple'
(69)   p'χʷɬt 'bunchberries'   (70)   qɬ (tr.) 'cause pain to'
(71)   q'ɬkʷ (tr.) 'fix up'   (72)   q'ɬp 'balsam fir'
(73)   q'pst (tr.) 'taste, sample'   (74)   q's 'tight, intense'
(75ᵃ)   q'χ 'rank, rancid'   (75ᵇ)   q'χ (tr.) 'carve'
(76)   √qʷsk (tr.) 'wind string on spool'   (77)   qʷ'ɬ 'laugh'
(78)   √qʷ's 'leak, ooze'   (79)   qʷ'χʷ (tr.) 'move'
(80)   sc' 'disperse, scatter'   (81)   sc'q 'animal fat'
(82)   scɬ 'frost'   (83)   sk' (tr.) 'scrape, rake, comb'
(84)   sk'st 'charcoal'   (85)   sk'x 'black'
(86)   skʷ' (tr.) 'undo, untie'   (87)   skʷc' 'wrinkled'

(88) skʷp (tr.) 'wet, moisten'   (89) sƛ'kʷ 'wart'

(90) słq' 'dried barbecued salmon'   (91) sp' (tr.) 'hit with a stick'

(92) sq' (tr.) 'cut, tear'   (93) sq'sk 'saskatoon berry'

(94) sqc' 'sand, gravel'   (95) sqʷ' 'fly, jump'

(96) sqʷł 'fishbone'   (97) stqʷ 'mud'

(98) stxʷc' 'cottonwood buds'   **(99) √sxʷƛ' 'inadequate'**

(100) sχc 'berry sprouts'   **(101) sχp (tr.) 'tie up'**

(102) tł 'strong'   (103) tx (tr.) 'cut with a blade'

(104) tχ (tr.) 'carve'   (105) t's 'salty'

(106) t'xʷ (tr.) 'brush, sweep'   (107) t'χt 'stone, rock'

(108) xp = px   (109) xʷc (tr.) 'discharge, remove, unpart'

(110) xʷp (tr.) 'untangle, try to free' (111) xʷp' (tr.) 'unhook'

(112) xʷt' 'collapse'   (113) χt 'brittle'

(114) √χƛ' 'incomplete'   (115) √χp' (tr.) 'permeate, penetrate'

The boldfaced entries beg the question of how Mellesmoen would decide which fricative(s) is/are nuclear, e.g.: Should *psx* (tr.) 'train, educate' be parsed as /pṣx/ or /psx̣/?

3.3 Words and roots containing fricatives only

Below I list words and roots that consist entirely of fricatives. Note recurrence of front+back and back+front sequences.

(116) łxʷ (tr.) 'spur, incite'   (117) √łχ 'negative, opposed'

(118) √łχʷ 'energetic, enthused'   (119) sx 'bad'

(120) sxłł 'afterbirth'   (121) sxʷ (tr.) 'burn, set on fire'

(122) sχ (tr.) 'scrape, plane'   (123) √xs 'all, whole, entire'

(124) χs 'fat, fatty'   (125) √χł 'lack, be deprived of'

(126) √χʷł (tr.) 'surpass, exceed'   (127) χʷs (tr.) 'oil, grease'

Again, Mellesmoen does not show us a procedure for determining nuclearity, and one might ask, for instance: Should *sxłł* 'afterbirth' be parsed as /ṣxłł/, /sx̣łł/, /sxłł̣/ /, or /ṣxłł̣/?

4   Area and diachrony

Long obstruent clusters and voiceless words also exist in two North Wakashan subdialects that are geographically close to Bella Coola (Figure 2): Heiltsuk (Bella Bella, Wáglísla) and Oowekyala (Rivers Inlet). Some Heiltsuk voiceless clusters and words (Kortlandt 1975:32) are:

(128) txtxní 'owl'   (129) ttxstú 'bulging eyes'

(130) txʷsx̌ƛáqà 'to jump over s.th.'   (131) tpkʷ 'flashlight'

(132) qqs 'eye'   (133) ƛxx̌s 'cross-piece of a canoe'
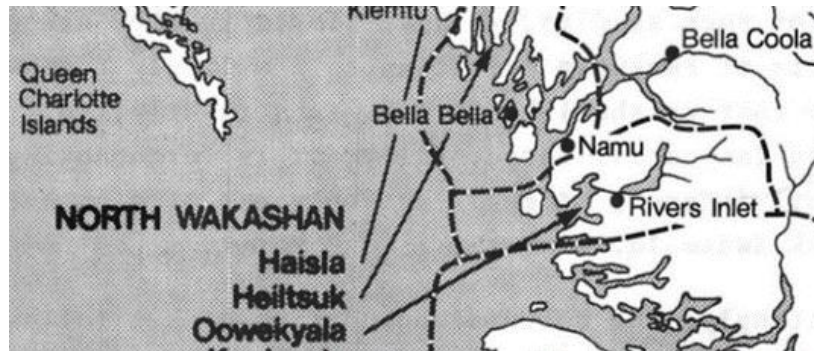
Figure 2: Bella Coola and North Wakashan (Lincoln & Rath 1980:3)

While Heiltsuk is tonal, Oowekyala, like Bella Coola, lacks distinctive stress or tone (Lincoln & Rath 1980:31–32). However, Oowekyala differs considerably from Bella Coola on the phonemic-phonotactic level.[5] In re long-standing contact, Boas (1886:203) states that South Bentinck and Rivers Inlet were connected via a frequently used overland route,[6] as reiterated by Howe (2000):

> […] the Oowekeeno at the top of Owikeno Lake had regular contact with the Nuxalk of South Bentick Arm, and intermarriage between the two tribes was not infrequent (McIlwaith 1948). […] The extremely rare consonant clustering property for which Nuxalk is notorious (see e.g. Nater 1984, Bagemihl 1991) is also found in Oowekyala […]
>
> (Howe 2000:3–4)

Some voiceless words are copies of Oowekyala roots that are themselves voiceless:

Table 6: Voiceless words copied from Oowekyala (Lincoln & Rath 1980)

List #	Bella Coola	Oowekyala
28	t'c (tr.) 'knock, strike'	√t́s 'to hit with a stone'
40	ks (tr.) 'pull'	√ks 'to push or motion away with the arm'
44	kʷł (tr.) 'crack, split'	√kʷł 'to collapse, become separated, disintegrate'
67	p's (tr.) 'bend'	√ṗs 'dented, to bend, to flatten'
73	q'pst (tr.) 'taste' (*/q'p-st/)[7]	√ṗq 'to taste'
78	√qʷ's 'leak, ooze'	√q̇ʷs 'to drizzle'
97	stqʷ 'mud'	√tqʷ 'covered with dirt, dust, soil'

Other voiceless words derive from $**C_1VC_2$ ($> *C_1\mathring{V}C_2 > C_1C_2$). In Table 7, Salish data are from Kuipers (2002), Kwak̓wala data from Lincoln and Rath (1980), Lillooet data from Van Eijk (2013), Sechelt data from Beaumont (2011), Upper Chehalis data from Kinkade (1991), areal data (Salish + Tsimshianic (+ North Wakashan)) from Nater (2018:169). Kw = Kwak̓wala, Li = Lillooet, NW = North Wakashan, PS = proto-Salish, PCS = proto-Central Salish, PIS = proto-Interior Salish, Se = Sechelt, Ts = Tsimshianic, UCh = Upper Chehalis.

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[5] North Wakashan has aspirated stops in addition to plain (often phonetically voiced) and ejective ones, as well as /λ/ and /λ̓/. See Howe (2000:9–15) for "degenerate" syllables and schwa epenthesis in Oowekyala.

[6] Distance from South Bentinck Arm (*Talyu*) to Rivers Inlet is around 48 km.

[7] √ṗq → √q'p may be due to avoidance of */p'q/ (see Table 4) and/or an association with √q'p 'dull'.

Table 7: Salish and areal origins

List #	Entry	Etymology or cognate(s)
(1)	ckʷ 'heavy'	PS *cəkʷ 'to pull (out), drag'
(3)	cq (tr.) 'pierce'	PS *ciq 'to dig, stab'
(8)	c'p 'stuck, blocked'	PCS *c'ap 'to derange, interrupt'
(12)	kʷ'p 'straight, right'	PS *k'ʷəp 'straight'
(14)	λ'kʷ (tr.) 'gather (tiny objects)'	UCh √λ'ək'ʷ 'to pick (up), peck'
(15)	√λ'q 'protrude'	PS *λ'aq 'to protrude'
(22ᵦ)	√tp 'spotted'	Via *tu̥p < Kw √tup 'speck, dot'[8]
(26)	tq' 'arrive by boat, land'	PS *t'aq' 'to cross over'
(30)	t'q (tr.) 'spread on surface'	Ts t'ᴀq 'flatten', PIS *t'əq 'put down, pile', NW √ṭaq 'spread'
(34)	c'ł (tr.) 'cover, shelter'	PS *c'il ~ *c'al 'shade, shadow, shelter etc.'
(35)	c's 'loud'	PS *c'əs 'to rattle, hit'
(37)	c'χʷ 'white'	Se <ts'exw> /c'əx̌ʷ/ 'get clean/washed'
(38)	kł (tr./itr.) 'fall, drop'	PS *kəł 'to be detached, come off/apart'
(48)	kʷ'ł (tr.) 'pour out, fill with water'	PCS *k'ʷəl 'to spill'
(53)	łk' (tr.) 'pull off'	PS *łik' 'to cut, sever'
(55)	łkʷ' 'big'	Se <lhakw> /łak'ʷ/ 'swell, get swollen'
(59ₐ)	łqʷ' (tr.) 'dig up, uproot'	UCh √łəq'ʷ 'break, pull apart'
(60)	√łt' (tr.) 'pry off, pull with hook'	PS *łət' 'to catch fish with hook and line'
(61)	łχʷt 'go through a passage'	PS *łəx̌ʷ 'to pass through a hole'
(62)	płt 'thick'	PS *pəł 'thick'
(72)	q'łp 'balsam fir'	PIS *c'q'-ałp 'fir'
(74)	q's 'tight, intense'	PS *q'əs 'to be of (too) long duration'
(75ₐ)	q'χ 'rank, rancid'	PIS *q'ix̌ 'strong, hard, tight, etc.'
(91)	sp' (tr.) 'hit with a stick'	PS *səp' 'to hit, club, whip'
(92)	sq' (tr.) 'cut, tear'	Ts saq' 'split', PS *səq' 'split'
(95)	sqʷ' 'fly, jump'	PS *saq'ʷ 'to fly, jump'
(106)	t'xʷ (tr.) 'brush, sweep'	PCS *t'əxʷ 'id.' and Ts t'axʷ 'id.'
(119)	sx 'bad'	Li √səx, √sax 'to degenerate'
(122)	sχ (tr.) 'scrape, plane'	PS *sax̌ 'to scrape'
(127)	χʷs (tr.) 'oil, grease'	PCS *x̌'ʷəs 'to oil, grease'

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[8] Kw √*tup* also underlies Bella Coola √*tup* 'foam, bubbles, specks' and *tutup* 'trout'.

5 Conclusions

The main purpose of this paper has been to prove that GENH is not "good enough" for Bella Coola, and that this language is fundamentally non-syllabic. I concur with Newman (1947):

> There are no syllables in Bella Coola, and no phonemically significant phenomena of stress or pitch associated with syllables or words. Within a sequence of phonemes one can, of course, hear acoustic pulsations and even differences in the relative degrees of pulsation. Such phonetic syllables result partly from the acoustic nature of the phonemes themselves. Because of their fortis articulation, ejective stops and affricatives are pronounced with stronger pulsations than their non-ejective types. Vowels and syllabic continuants, because of their duration and voicing, stand out acoustically above all other phonemes in a sequence.
>
> (Newman 1947:132)

Still today, this statement is more convincing — as concerns phonetic detail and succinctness — than the theoretical hype of GENH and other hypotheses (for which see Bagemihl 1991:593–596).

Below, I cite words and roots that are not GENH-compatible (T = stop, F = fricative). I list only those TT… and TF/FT… clusters that appear in boldface in sections 3.1 and 3.2.

Table 8: Counter-GENH words and roots

List #	Entry	Structure	List #	Entry	Structure	List #	Entry	Structure
9	kp	*TT*	**12**	kʷ'p	*TT*	**13**	kʷ'pt	*TTT*
19	√q'p	*TT*	**20**	qʷt	*TT*	**21**	qʷ'p	*TT*
22	√tp	*TT*	**23**	tk'	*TT*	**24**	tkʷ	*TT*
25	tkʷ'	*TT*	**26**	tq'	*TT*	**27**	tqʷ'	*TT*
29	t'kʷ	*TT*	**30**	t'q	*TT*			
39	kɬx	*TFF*	**61**	ɬχʷt	*FFT*	**64**	psx	*TFF*
69	p'χʷɬt	*TFFT*	**90**	sɬq'	*FFT*	**99**	√sxʷƛ'	*FFT*
100	sχc	*FFT*	**101**	sχp	*FFT*			
116	ɬxʷ	*FF*	**117**	√ɬχ	*FF*	**118**	√ɬχʷ	*FF*
119	sx	*FF*	**120**	sxɬɬ	*FFFF*	**121**	sxʷ	*FF*
122	sχ	*FF*	**123**	√xs	*FF*	**124**	χs	*FF*
125	√χɬ	*FF*	**126**	√χʷɬ	*FF*	**127**	χʷs	*FF*

For a phonotactically divergent language such as Bella Coola, terms like "mora", "nucleus", and "syllable" are not meaningful.[9] Predictable presence/vacillation/absence of schwa (vocalic peak) in sonorants is a phonetic issue (allophony) rather than a phonemic one (phonotactics).[10] As well, it is difficult to determine "nuclearity" of fricatives in *FF(F(F))* clusters (see sections 3.2 and 3.3).

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[9] See Cook (1994) for a lack of consensus on the term "mora".
[10] Recall that /m : m̥/ = /n : n̥/ = /l : l̥/ = /y : i/ = /w : u/ = /h : a/.

On the other hand, one may argue that, in order for GENH to gain credibility, Mellesmoen could consider including stops as being potentially nuclear. Phonetic features seem to support this idea: while fricatives are only quasi-sonorant (with duration, but without voicing), fortis stops like /q'/, /k'/, /ƛ'/ have more acoustic strength than fricatives in terms of amplitude and slight affrication and/or delayed glottal release in non-prevocalic settings. This is illustrated in figures 3 and 4 below.
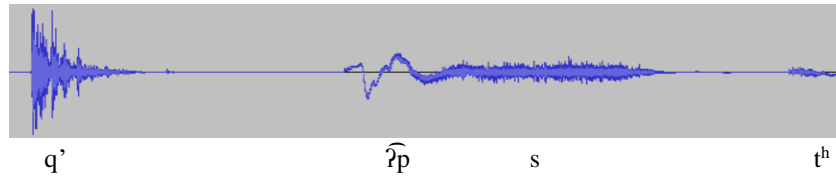
Figure 3: Spectrogram of *q'pst* [q'ʔ͡pstʰ] 'taste (tr.)' (FirstVoices, Audiotonic)
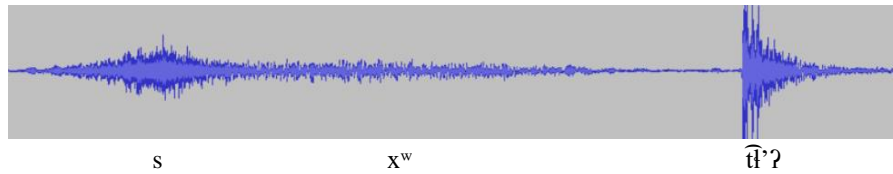
Figure 4: Spectrogram of √*sxʷƛ'* [sxʷt͡ɬ'] 'inadequate' (FirstVoices, Audiotonic)

However, by including amplitude, allophonic affrication, and delayed glottal release of stops as additional measures of syllabicity, we would complicate rules on sonority-related hierarchies even further.

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