On Proto-Algonquian *h and *l reflexes in Innu-Aimun:
A Case Study of Rhinoglottophilia

1. Introduction

This paper briefly describes the historical phonology of /n/, /l/, /r/, and /h/ phonemes in Innu-Aimun dialects, principally by comparing Proto-Algonquian (PA) reconstructions of *h, *l, along with consonant clusters such as *hl, *nl, and *$ʔl$, with Old Montagnais (putative ancestor to the East Cree/Naskapi/Innu-Aimun (or "Montagnais") dialectal continuum, spoken in Quebec and Labrador) documents and extant related dialects. Our purpose is to explore the various difficulties regarding the numerous reflexes in Innu-Aimun dialects that derive from these PA phonemes, which do not lend themselves easily to traditional sound change rules. The strikingly different features found in the modern reflexes represent a challenge for diachronic mechanisms of sound change. We foreground rhinoglottophilia, undiscussed in Algonquian linguistics, as the most suitable observation and potential explanation for the frequently observed connection between nasalized segments and [h].

Questions of interest include conflicting cladistics and phonological reconstructions, historical population movements (Emőke 1983) which may have led to interdialectal borrowing or influence, and a detailed discussion of 17th century Early Montagnais-Naskapi (EMN). After our exploration of rhinoglottophilia, we assess competing explanations which have different motivations in attempting to predict or explain the data and speakers' abstract forms, such as underspecification (Kiparsky 1995), the contrastivist hypothesis (Hall 2007), a hierarchically determined model of contrast, which has been successfully applied to vowels in this language family (Oxford 2015, 2016), and the theory of the life cycle of phonological changes proposed by Bermúdez-Otero (2007, 2015), all of which fail to coherently explain the observed diachronic changes. An ancillary question is how the diachronic changes inform our notion of the clades.

The proposed method for investigation is a comparative cross-theoretical analysis of the development of these phonemes, with the data coming from reconstructions (Bloomfield 1925, 1946, Aubin 1975), modern dialects (various online dictionaries as noted below) and two 17th century sources (Fabvre 1695, republished in 1970 & Silvy 1678, republished in 1974). Furthermore, there are some interesting renderings of French (or English in the case of those dialects in Labrador) loanwords that have initial, medial, or final /n, l, r, h/ which can shed light on diachronic developments. The problem is further compounded by a certain degree of confusion regarding the cladistics of this particular dialect complex – in this paper, we argue for a particular clade which fits in best with our diachronic phonological reconstruction.

2. Background

2.1. Cladistics and Genetics

Innu-Aimun (Montagnais) is a Central Algonquian language spoken in Labrador and a large part of the northeastern portion of Quebec. It belongs to the East Cree-Montagnais-Naskapi language continuum, and has syntactic, morphological, and phonological properties which for the most part are similar to those found in other Central Algonquian languages, such as Plains Cree (Alberta, Saskatchewan, Manitoba), Ojibwa (Ontario), and Menominee (northeastern Wisconsin). There are two complicating factors relevant to us here – the controversial claim that Central Algonquian is a geographic grouping rather than a genetic grouping (Proulx 2005), and secondly, the competing cladistic reconstructions we see in the literature.

Stepping back to prehistoric times, Siebert (1967) undertook detailed examination of floral and faunal word lists in several Algonquian languages, reconstructed their Proto-

Algonquian counterparts, and matched the final array with ancient ranges and climates. He concluded that from about 1200 BCE, PA was spoken in a restricted region of south central Ontario. From this ancestral location successive migrations spread outward, so that shortly after 900 BCE those whose descendants were to become caribou hunters had shifted to the north, while future bison hunters had moved southwest and southeast (Siebert, 1967, Moody 2011). Denny (1991) and Foster (1996:100) disagree with the details of Siebert's account and place the homeland west of Lake Superior, also echoed by Goddard (1994:207), though they looked at a smaller set of cognates. The bulk of Central Algonquian languages today are indeed found west of the Great Lakes, so it is no surprise to see some others were inclined this way. But the names of animals and plants change over time (Sagart et al. 2019), or may be transferred to other species (Pentland 1979:332) so one has to be careful, as even closely related tribes may sometimes use different etymons for similar or identical flora or fauna (Buchner 1984). Another perhaps dicey strategy is to examine a *lack* of evidence for vocabulary and then try to pinpoint a location – Snow's (1976a)[1] archaeological search proved fruitless.

On the issue of genetic (taxonomic) unity – Proulx (1980:14) demonstrates with high certainty that Cree-Montagnais-Naskapi form a lower-level genetic cluster, though no further details down the tree are discussed. Proto-Central-Algonquian as an intermediate protolanguage has generally been discarded (Teeter 1967, Goddard 1967, Haas 1966a), though its use as a geographical grouping continues, especially to describe all non-Eastern Algonquian languages (Proulx 2005).

According to Emőke (1983:301), the Blackfoot are the most divergent of Algonquians. His genetic analysis regarding inter-group genetic distance support the claim that the Naskapi represent the easternmost division of the Cree, though of the northeasterners, the Innu are most divergent, although they are slightly closer to the Cree than to Naskapi or Ojibwa, with the caveat that there has been "[e]xtensive intra-Algonkian [sic] admixture" (*ibid.*:312). However, it is surprising to see that the Naskapi are almost twice as distant from Cree as the Cree are from the Ojibwa (*ibid.*:306, see Rhodes 2020:571 for borrowings).

Regarding the clustering of East Cree ("Western Montagnais" in Pentland 1979) with Innu and their position within the Algonquian family tree – the topic of the precise subgrouping of East Cree dialects with Montagnais (Naskapi and Innu) has been subject to some debate in the literature, as well as the higher-order position of this dialect continuum within Central Algonquian. As explained by Szathmary and Auger (1983:291), Bloomfield

1 Snow (1976b, 1978) interprets the archaeological record of the East Coast as implying an Algonquian occupation of eight to ten thousand years. If so, it must greatly antedate the original Algonquian dispersal (based on solid comparative evidence) and the PA and Proto-Algic homelands both must have been the East Coast; this claim is countered by Proulx (1980).

(1946) linked Cree-Montagnais-Naskapi into a single dialect continuum, while Teeter (1976) distinguished between Cree and Montagnais-Naskapi. Other authors such as Graburn and Strong (1973), have thought of Naskapi and Montagnais as the northern and southern divisions of the easternmost Cree territory, rather than distinct populations. As a matter of convenience, many authors (McKenzie 1982, Scott 2000) simply use the initialism CMN (Cree-Montagnais-Naskapi) and describe it as a "language complex". The diagram in Figure 1 below tentatively reconstructs the clade which we are focusing on, along with approximate dates below. The PA *l phoneme is the litmus test for determining the main dialectal groupings for the Innu dialects, hence the terms "*n*-(sub-)dialects" (seen in the Central, Eastern, and Labrador subdialects), "*l*-dialects" (Southern dialects), "*y*-dialects" (still kept intact in East Cree and Naskapi), and, historically, "*r*-dialects", present in Early Montagnais-Naskapi and Early Innu (17-18th centuries). For example, PA *$lala{\cdot}watwi$ 'it is destroyed' survives in Coastal Southern East Cree as *iyaayuun* , in the Coastal Northern East Cree as *iyaayuwin*, and in most Innu-Aimun dialects as *nanun*, but $la{:}lu{:}n$ in the Southern Innu subdialects, and *iyaayuun* in Naskapi.

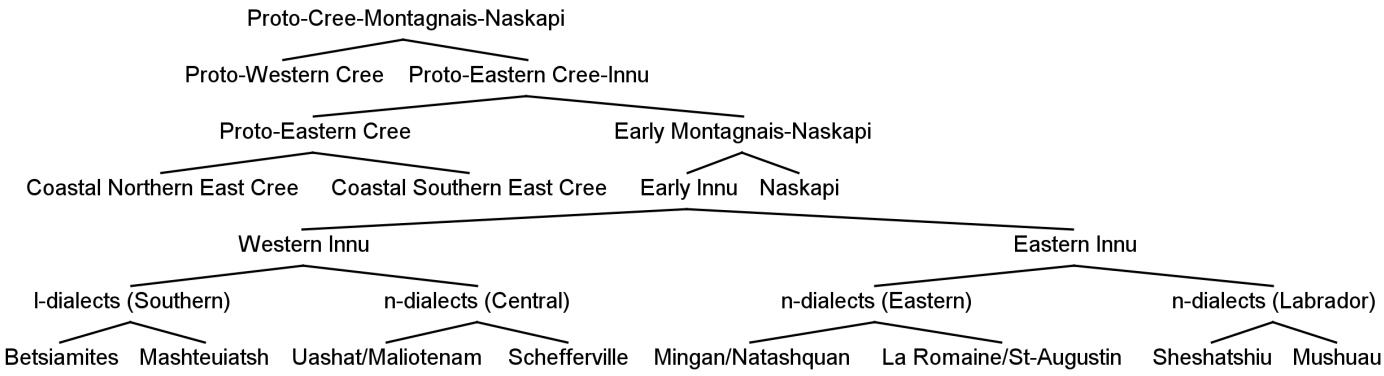

Figure 1: Our reconstruction of Proto-Cree-Montagnais-Naskapi

Language (stage)	Time period	Notes
Proto-Algonquian	1200-500 BCE	Ancestral proto-language
Proto-Central Algonquian	~200-800 CE	Rough estimate, geographical grouping
Proto-Cree-Montagnais-Naskapi	~1000-1200	Highest-level node for cluster in question
Proto-Eastern Cree-Innu,	~1200-1400	
Proto-Eastern Cree	~1400-1600	
Early Montagnais-Naskapi	17th c.	Earliest written language
Early Innu	18th c.	
Coastal Northern East Cree	20-21st c.	Inland subdialects have more Innu features
Coastal Southern East Cree	20-21st c.	*Ibid.*

Eastern Innu	19th c.	
Western Innu	19th c.	
WIMB[2] (Southern)	20-21st c.	
WIUSM[3] (Central)	20-21st c.	
EIMNLS[4] (Eastern)	20-21st c.	
EISM[5] (Labrador)	20-21st c.	
Naskapi	20-21st c.	

Figure 2: Table showing the rough time periods and designations.

Michelson (1939:87) remarks that the *r*-dialect "early disappeared or was modified" and cites Alexander Henry (1809:214), who describes the language of the Têtes-de-Boules (Atikamekw) as a "mixture of those of its neighbours, the Chipeways [obsolete and erroneous term for Innu] and Cristinaux [Crees]", which partially anticipates other authors who have mentioned that Atikamekw was a language which has undergone considerable change due to a contact situation with their historically allied Innu neighbors. This is reminiscent of comments made regarding other mixed Algonquian languages (Rhodes 1992).

The tree model above in Figure 1 is based on our own internal reconstruction – later on, we include statements for each sound change for each node – the anterior nodes being the attested or reconstructed intermediate forms (thus the underlying or historical forms). The tree model is generally regarded as having shortcomings vis-à-vis either the wave model or the linkage model for cases involving dialectal continua. Scott (2000:8), for example, has an alternate tree, shown here in Figure 3 below, which actually places Naskapi much further down the derivation, and makes Naskapi essentially a cross-dialect between the Southern Coastal East Cree dialects (Mistassini or Mistissini, an inland dialect of SCEC, and Waskaganish, right along the Bay James coast) and the Innu *n*-dialects. Due to the much greater conservatism of Naskapi, especially regarding clusters which we will see below, and their closer similarity to East Cree dialects, we reject this particular cladistic reconstruction.

2 WIMB – Western Innu group – Mashteuiatsh and Betsiamites (Pessamit) subdialects.
3 WIUSM – Western Innu group – Uashat (Sept-Îles) Schefferville, and Maliotenam subdialects.
4 EIMNLS – Eastern Innu group – Mingan (Ekuanitshit), Natashquan, La Romaine (Unaman-Shipit), and St-Augustin subdialects.
5 EISM – Eastern Innu group – Sheshatshiu and Mushuau subdialects.

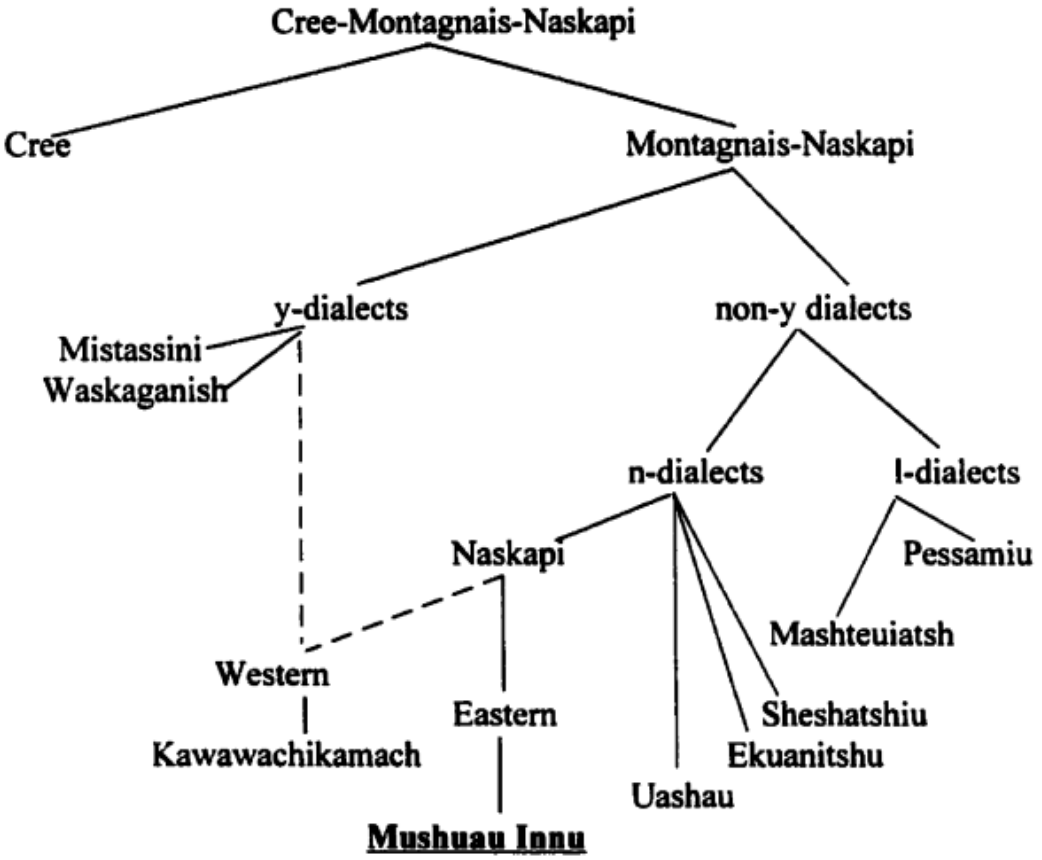

Figure 3: Scott (2000:8)'s reconstructed tree.

There is much disagreement in the literature about the exact details – though this article makes certain assumptions about the position of (sub-)dialects within the tree, our analysis does not hinge on a particular grouping. Scott (2000:9) disagrees with MacKenzie's (1980:214) grouping based on morphology and PA *l reflexes; she finds that there are only two major subgroups: y-dialects, and all others. This suggests that the y-dialects are innovative and that the others are conservative (the opposite of what our analysis implies), though the image is muddied when it pertains to the details given the large number of modern reflexes of this same phoneme. Michelson (1939)'s classification is radically simpler – he essentially draws a tripartite grouping of these dialects (l-dialects, y-dialects, which look like how we would classify these, and n-dialects, which he considers as "Naskapi", starting from Uashat northwards, which is by modern classificatory schemes squarely placed as Central Innu).

One of the main difficulties is a conceptual one – are groupings based on shared archaisms or shared innovations? Doing a proper cladistic analysis with a quantitative model is beyond the scope of this paper, but we nonetheless use the traditionally accepted technique in historical linguistics of using shared innovations as a justifiable reason why a node should exist in the first place (Jacques & List, 2019). Our reconstruction below examines each node in the tree, along with plausible or likely explanations based on phonetic grounds.

A computationally-motivated reconstruction of Algonquian phonetic and semantic similarity has been carried out (Kondrak, 2001), but it only included Cree, Fox, Menomini, and Ojibwa[6], thus it was not a full cladistic reconstruction, and did not concern itself with lower-level (finer, closer to the leaf) connections among the languages. However, regarding computational work comparing vocabulary, we ought to be suspicious as such studies typically do not concentrate on shared innovations, rather they commit to a form-to-form comparison, which is suggestive but not conclusive. As Ringe, Taylor & Warnow (2002) imply, the presence of stranger and unlikelier sound changes are more advantageous to the historical linguist in the sense that they decrease the probability that such innovations were independently (accidentally) shared.

To recapitulate, in our analysis, we are essentially writing fragment of grammar, seen through different proposals that explain them in terms of their explanatory adequacy. Some make predictions that others do not and some of those may be interesting and valuable; e.g. those that fall outside the realm of certain expected and natural changes are particularly noteworthy.

2.2. Historical Background and Chronology

Several consonant clusters of PA[7] have been simplified in CMN (Bloomfield, 1946:443-446) such as PA **ns*, **hs*, **qs*, **nš*, **hš*, and **qš*, but preaspirated segments (hC) have been maintained in East Cree and Naskapi. Scott (2000:17) notes that many of Bloomfield's consonant clusters involve an initial consonant which does not occur in his consonant inventory for PA. Bloomfield says that these initial consonants are "obscure elements which we render by arbitrary symbols" (Bloomfield 1946:443).

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6 Tests performed on vocabularies of these four Algonquian languages indicate that the method is capable of discovering on average nearly 75% percent of cognates at 50% precision. Their results show that it is possible to identify a large portion of cognates in related languages without explicit knowledge of systematic sound correspondences between them or phonological changes that they have undergone, the reason for which are that cognates on average display higher phonetic and semantic similarity than words that are unrelated.

7 Bloomfield (1946)'s reconstructed consonant inventory of PA (voicing and length are not contrastive) is the following:

p	t		k	ʔ
		t͡ʃ		
		θ s ʃ		h
m		n		
w		l	y	

Though vowel lengths are contrastive – **i, *e, *a, *o,* versus their long counterpart, commonly written as either a middle dot, i.e. **i·*, or colon. Bloomfield (1946) also reconstructs **w*, though he isn't very explicit about it (he suspects that **y* and **w* are just nonsyllabic allophones of **i* and **o*, which does not pan out, so far as some authors can see (Haas 1966b:482)). Routledge's Handbook (Oxford 2019) claims the existence of **w* as well. For PA **l*, some sources say **r* (Oxford 2016:3) as PA's only liquid; though Bloomfield (1946) used **l*, Pentland (1979:350) and Goddard (1994:204–5) have argued that its phonetic value was more likely rhotic than lateral.

On the issue of whether or not Central Algonquian (CA) is a coherent group – for certain phonemes as we will see below, we have a need to show some innovations in this particular grouping, though we remain agnostic on this question. Since we are focusing on PA *h and *l (along with their clusters) reflexes, it just so happens that Proto-CA (PCA) is conservative in these respects. We thus also remain agnostic regarding the dating of PCA – a rough estimate would be that a multi-leveled split occurred from it more than 1200 years ago.

Proto-East-Cree-Innu (PECI) is the highest-level clade that we are concerned with here – the dates are only rough estimates – West Cree dialects (Plains, Rocky, Woods, Swampy, Moose), which represent the western part of the west-to-east cline, are not dealt with here. Proto-East Cree (PEC) likely split earlier than the 17th century, given the data we have on Early Montagnais-Naskapi (EMN) which we make plentiful use of. Naskapi split off early on, likely in the early 18th century, and is generally conservative, making its surface forms look more often than not closer cognates with the East Cree dialects. EMN speakers were already in the process of having variation, especially when it comes to the PA *l reflex, so a later reconstruction is rendered very plausible.

2.3. General Remarks on Syllabic Structure

The *hp, *hk, *ht, *$hč$, *hl, *nl, and *$ʔl$ clusters that we will be exploring below are neither complex onsets, nor complex codas – rather, these are boundary clusters as far as we have been able to reconstruct in PA (Bloomfield, 1946).

PA had a maximal syllabic template (C)(G)V(:)(C), where G is a glide (Oxford 2019). Small changes in syllabic structure can have major consequences down the line, which is why it is worth concentrating on them. Notice that clusters such as the aforementioned *hp, *hk, *ht, *nl, *$ʔl$, etc., can only occur between syllable boundaries – such as in East Cree *misisaahkw* (from PA *$mesesahka$ 'horsefly'), as a PA coda consonant is always followed by an onset consonant, creating a C_1C_2 cluster. The daughter languages exhibit a wide range of changes to their C_1 coda consonants, such as Miami-Illinois *$θ > l$ but *$θk > hk$.

Because C_1 was so often syncopated (not just word-finally), we typically see the daughter languages tolerating fewer types of consonantal codas. For example, Coastal Northern East Cree has a (C)V(:)(C) template (Dyck et al. 2006, 2008) and the onset can contain any single consonant and the coda can only contain *s*, *sh* or *h*. (Thorburn 2010:6).

Other common changes include a merger of *$ʔ$ and *h (e.g. PA *$ʔt$, *ht > Delaware *ht*, and Coastal South-East Cree *chiiskaham* 's/he pokes it' and *chihchineu* 's/he pokes him/her

(anim.) with the hand' possibly derived from PA *čiːʔt-* 'jab, prick'.), debuccalization of nasals (e.g. PA **nt* > Cheyenne *ht*, which is a case of glottorhinophilia as we will see later), and complete loss of particular coda consonants (PA **nt* > Massachusett *t*).

3. Sound Change Analysis

In this section, we go over the diachronic development of PA **h* and **l* and related clusters. In these tables and trees below, whenever two documented phonemes are shown, the first of the two is the empirically better documented variant. The trees below are to be taken as an exposition of diachronic sound changes. All data unless otherwise cited are from the dictionaries compiled by the Algonquian Linguistic Atlas's Algonquian Dictionaries and Language Resource Project; note that not all words have surviving etymological cognates in sister languages, and these dictionaries occasionally are incomplete for certain dialects. Standard orthography is used for East Cree dialects, Naskapi, and Innu (which uses a pandialectal written standard).

3.1. Diachronic Development of **h* + Clusters

PA	*h	*hp	*hk	*ht	*hč	*hl
PCA	*h	*hp	*hk	*ht	*hč	*hr
EMN	h / Ø[8]	hp	hk	ht	hč	r / h[9]
CNEC	h(V:)	hp / p[10]	hk	ht	hč	hy
CSEC	h(V:)	hp / p[11]	hk	ht	hč	hy
WIMB (S)	V:_ / Ø	p	h	t	š	l
WIUSM (C)	Ø	p	k	t	š	n
EIMNLS(E)	Ø	p	h	t	h	n
EISM (L)	Ø	p	k	t	š	n
N	h	hp / p[12]	hk	ht	hč	hy

Figure 4: Table showing the reflexes of the PA **h* and related clusters

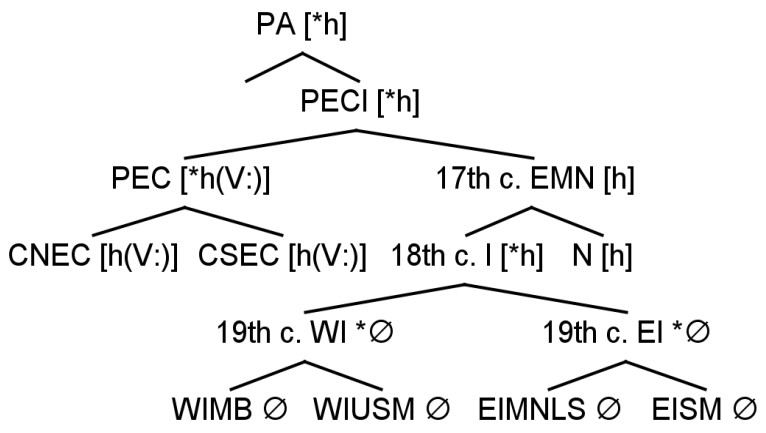
8 For the EMN row here, we list the phonetic representations of these phonemes and clusters – orthographically, pre-aspiration was ignored. Slashes represent the two attested forms based on Silvy 1678 and Fabvre's 1695 wordlists .

9 There might remain some (morpho-)phonological conditions which are undiscovered which may explain why there was some kind of synchronic *r*/*h* variation. Further discussion in section 3.2.

10 When the *hp* cluster is found between the first two syllables (word-initial vowels tend to be elided, hence the *h* drops).

11 *Ibidem.*

12 *Ibidem.*



Starting with **h*, we note that there are no word-initial and no word-final PA morphemes (or polymorphemic words), but it does in EMN according to Silvy and Fabvre's 17th century wordlists. Harvey (2005:58-59) explains that these lexical entries are either onomatopoeic or foreign words, such as *haïachtime8* (Silvy 1974:35, orthographic '8' here stands for a [w]) 'those from Gaspé', *Hiatchirini8* (Fabvre 1970:69) 'stranger from another nation'. A peculiar transcription habit that Harvey (2005:59) remarks upon is the practice of inserting "a silent h", such as in the loanword *Hehebigau*, for which the French is written *Haragnée* (Fabvre 1970:69) 'spider'. Examples with intervocalic **h* in PA are plentiful, and show a predictable pattern, with Innu dropping the entire *h*-containing syllable altogether, with certain dialects being affected by compensatory lengthening of the preceding vowel:

(1)	PA: *naha:piwa 's/he sees well'	(2)	*ešpahamwa 's/he flies, upward'
	CNEC: nihaapiu		
	CSEC: nihaapuu		
	Innu: napu[13]		ishpau 's/he flies high'
	Mamit/Uashat/Mingan: [naːpu]		
	Unaman-Shipit:		[ihpaːw]
	N: naahaapimaaw		ispaahaaw

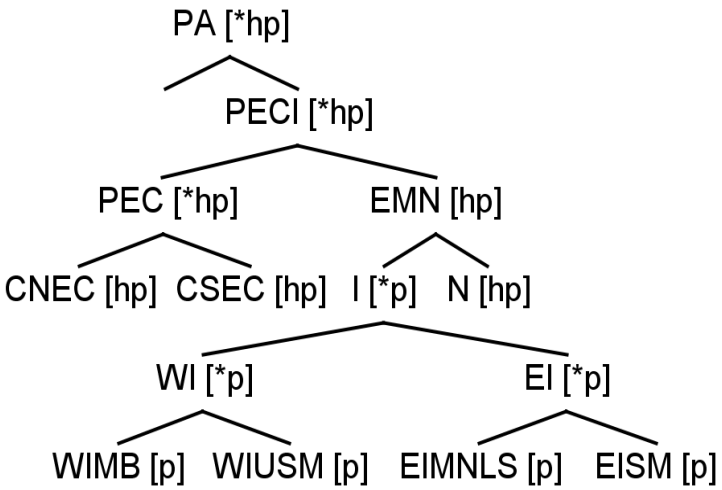
In the modern Betsiamites (Pessamit) subdialect of Western Innu, although now no longer phonetically overt, /h/ in suffixes is the driving force behind falling tone[14] (Harvey 2005) – it is thus likely that in EMN, word-final /h/ was pronounced. Intervocalic /h/ was dropped in most Montagnais-Naskapi dialects except between vowels of identical quality (MacKenzie 1980: 63). This is also the case in Mushuau Innu (Scott 2000:19). There is also another source of [h] in most modern Innu dialects – synchronically, /ʃ/ becomes [h] before a

13 All words written in Innu use the standard Innu orthography as used today in Quebec and Labrador, which is essentially a pan-dialectal script, whereas the specific IPA transcriptions are taken from the Aimun-Mashinaikan Dictionnaire Innu https://dictionary.innu-aimun.ca.

14 Contrastive tone has developed in Cheyenne, Kickapoo, and Western Innu subdialects; pitch accent systems, sometimes described as tonal, have developed in Blackfoot, Arapaho, MaliseetPassamaquoddy, and Penobscot (Oxford 2019:510).

vowel or in word-final position (MacKenzie 1980:77). In Sheshatshiu, this process occurs word-initially and intervocalically (Clarke 1982:18), while in Mushuau Innu, it occurs only intervocalically (Scott 2000:19). Thus, taken together, the sound change rules are the following:

(3) East Cree: h → h(V:)
WIMB: h → V:_ / Ø
WIUSM: h → Ø
EIMNLS: h → Ø
EISM: h → Ø



Next, we have **hp* which behaves differently based on whether the -h- part of the cluster belongs to the word-initial syllable starting with a vowel (compare the development of (4) and (5) below) or any subsequent syllable. In the former cases (*V:hp), all dialects within the CMN continuum underwent apheresis as a result of the weakening of word-initial stress (Clarke 1982), thus we only have p- remaining[15], and in the latter cases (word-medial **-hp-*), Innu dialects simplify the cluster to *-p-* and all other dialects maintain *-hp-*.For EMN, Harvey (2005:18) explicitly treats *hp as /hp/, where the /h/ likely indicates pre-aspiration, even though neither Fabvre nor Silvy orthographically indicated pre-aspiration. In the modern languages, this /h/ in consonant clusters has disappeared in all Innu dialects except for Mashteuiatsh (Pointe Bleue), and it is maintained in East Cree, and Naskapi (Ford 1977:243) as we see in the data below. Harvey also makes an educated guess by stating that the Mashteuiatsh subdialect of Innu is probably the direct descendant of Tadoussac Montagnais, thus he thinks that it is reasonable to propose that the /h/ in /hC/ was retained in EMN. Furthermore, **mp* cluster merges with **hp* in Old Montagnais, resulting in /hp/.

(4) PA: *a:hpawe:wa ‘dream’
EMN:

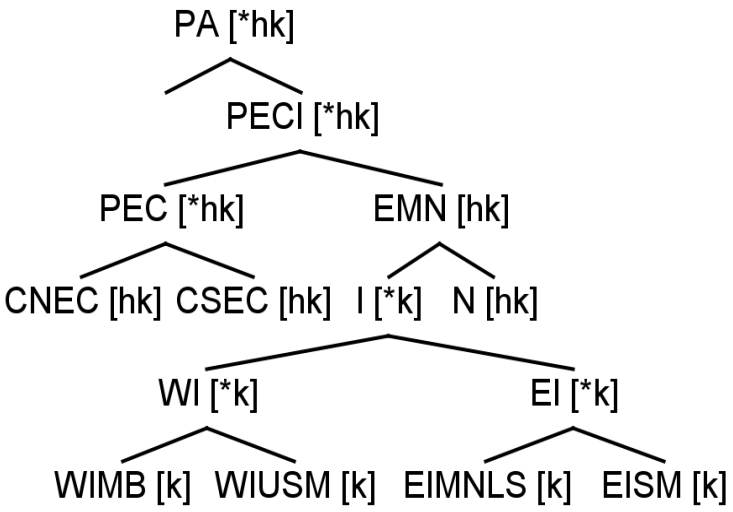
(5) *a:pa:hpiwa ‘s/he laughs’
papini8 [pahpiniw]

15 There are PA root derivatives such as **a:hpene* (uniformly) and **a:hpeči* (completely) which unfortunately have not produced offsprings in Innu or nearby languages – we would expect something like **pineu*.

CNEC: puwaamuwin	paahpiu
CSEC: puwaamuwin	paahpuu
Innu: puamun	papu
WIMB & Sheshatshiu:	[paːpu]
N: puwaamuuun	paahpuw

(6)	PA: *eθahpitaːwa	(7)	*wempenamwa ‘s/he lifts it up’
	EMN:		8ipinam8 [wihpinamw]
	CSEC: itahpiteu ‘s/he ties it in a certain way’		uhpineu
	CNEC: iitihpitaau		uhpinam
	Innu: itapikateu		upineu
	WIMB: [iːtaːpəkaːteːw]		
	N: asw**aahpiti**m ‘s/he ties her/his hair back’		uuhpinaaw

The **hk* cluster too shows unremarkable changes – Innu dialects delete the *h*, whereas the others do not. For EMN, **hk* and **nk* appear to collapse as *hk* in 17th century which later becomes leveled as *h*; for example: *aθaːnkweːnsa* (PA, diminutive ‘star’) --> Coastal North-East Cree *achihkuhsh,* Coastal South-East Cree *achahkush*. Sheshatshiu Innu [utʃeːkətaːkʷ][16], Ekuanitshit (Mingan) [utʃeːkataːhkʷ], Western Innu [utʃeːkətukʷ], *uchaakitaahkw* in Naskapi.



However, there appears to be an exception in the Mamit subdialect in which -hk- appears to be maintained in nouns which use *atikᵘ* (such as in *uapatikᵘ* [waːpatiːhkʷ], ‘albino caribou’)– but the -h- disappears in verbs such as *nutatikueu* [nuːtatiːkweːw] ‘s/he is busy harvesting caribou’, *muatikueu* [umwaːtiːkweːw] ‘s/he eats caribou’, *uinatikueu* [wiːnatiːkweːw] ‘s/he butchers a caribou’, or even in nouns which use the (-)atiku- form, such as *nuatikuan* [nawaːtiːkwaːn] ‘designated location where caribou is chased by canoe’, *atikuss* [atiːkuss] ‘young caribou’. The Unaman-Shipit subdialect also appears to have some exceptions for this same word, such as in *nipinatikᵘ* [niːpɨnaːtɨhkʷ] ‘male caribou in the spring or summer when his antlers have grown back’ and *ushakatikᵘ*

16 Pronunciations of various Innu dialects from https://dictionary.innu-aimun.ca.

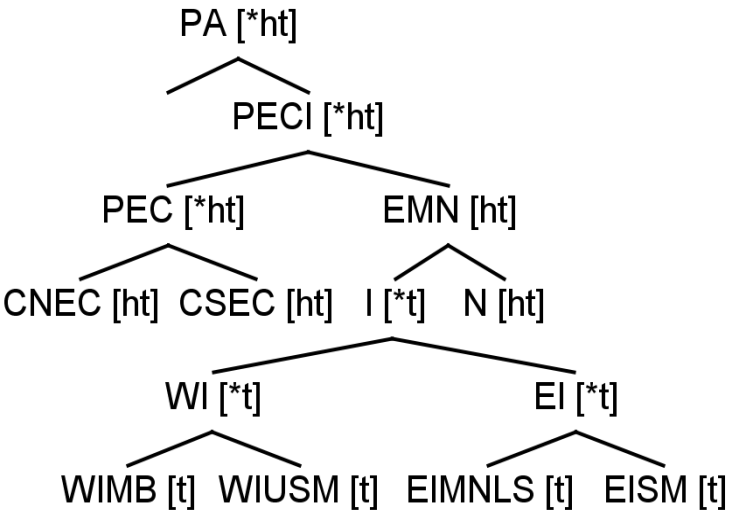
[uhaːkatiːhkʷ] ‘good place for caribou’. These could be as a result of borrowing from the neighboring Naskapi – reconstructions here could potentially be suspect as a consequence (Hewson 1979). An alternative explanation is that these “rebuccalizations” were reintroductions of *-h-* (unrelated to diachronic *h*) as a kind of secondary effect of compensatory lengthening.

(8) PA: *-hkaːso (‘to pretend to’)
CSEC: -hkaasuu
CNEC: -hkaasuu
Innu: -kashu
Ekuanitshit [-kaːhu]
Mamit:
WIMB: [-kaːʃu]
Unaman-Shipit: [-kaːhu]
Mushuau:
Sheshatshiu: [-kaːʃu]
N: -hkaasuw

(9) *apahkwaya ‘reed’, later ‘tenting’
apakuai ‘heavy canvas, duck fabric, tent covering’
[apaːkweːj]
[pukwiː]
[əpaːhun]
[əpaːkwiː]
piihtuupaahkwaaw ‘s/he covers the tent’

(10) PA: *atehkwa ‘caribou’
CNEC: atihkw
CSEC: atihkw
Innu: atikᵘ
Mamit: (EIMNLS) [atiːhkʷ]
Sheshatshiu: [tiːkʷ]
Uashat: [tiːkʷ / tukʷ]
WIMB: [təkʷ]
N: atiihkw

(11) *akohke:wa ‘it sticks’
akwaahkitisuu ‘it is stuck onto something by heat’
akwaahkateu ‘it sticks to the pan’
akukateu ‘it sticks to the bottom during cooking’
[kukəteːw]
akuuhkaataaw ‘it sticks to the pot and burns’



**ht* follows the same pattern as well, with the Innu dialects dropping h, as we see from *atehte:wi* ‘it is colored’ and *axpi:htenekwesiwa* ‘s/he is of a certain weight’ below. This is thus part of a general trend in the grammar. The historical EMN form, at least in spelling, does not contain h which is unlikely to have been the case, unless we posit that the East

Cree and Naskapi split off earlier than the core Innu dialects. The same explanation offered for why EMN orthographic /k/ and /p/ (in positions where PA has [hk] and [hp] respectively) must have included the [h] must stand for /t/ as well. There are three other sources of 17th century /ht/ – *nt, *$n\theta$, and *$h\theta$.

(12) PA: *atehteˑwi ‘it is colored’
EMN: atiteu
CNEC: atihtaauh ‘the berries turn color’
CSEC: **atihteu**sinahiicheu ‘s/he is coloring’
Innu: atiteu ‘it has a color, changes color, it (fruit) is ripe’
Nutashkuanit: [atiːteːw]
Pessamit: [təteːw]
Unaman-Shipit: [atiːtʃeːw]
N: **atiihtaa**piyuw ‘it (anim.) changes color, it (fruit, berry) ripens’

(13) PA: *eθpahtawiwa
CNEC: iispihtaau ‘s/he runs there’
CSEC: ispahtaau
Innu: ishpatau ‘s/he goes sw. running’
Pessamit: [iːʃpətaːw]
Mamit: [ihpaːtaːw]
N: ispaahtaaw ‘s/he goes sw. running’

(14) *axpiːhtenekwesiwa ‘s/he weighs (intr.)’
ispihtinikutuu
ispihtinikutuu
ishpitinikuan
[iːʃpətnukun]

Thus for *h + stops, the sound change rule is straightforward:

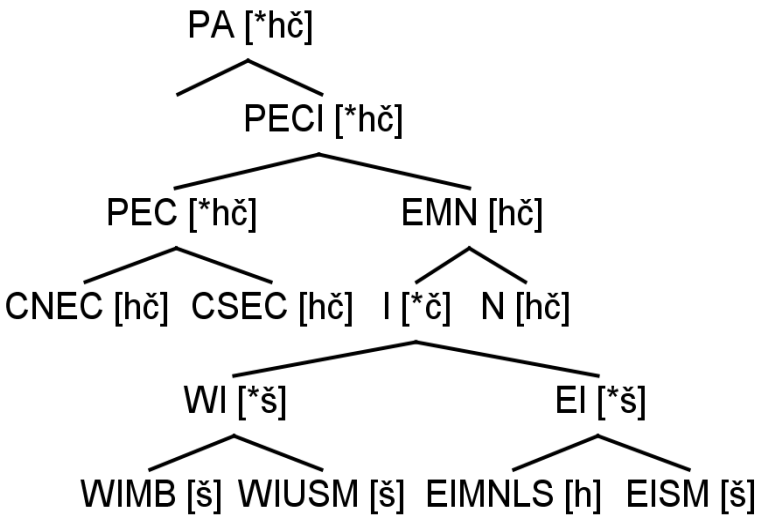
(15) All Innu dialects: h + stop → h
Elsewhere: h + stop

One major exception is the PA word for ‘bow’ given that its descendants show irregular -(h)tš- where one would not expect any kind of palatalization, which is strong evidence that this term was borrowed in ancient times from another Algonquian language that underwent this particular sound change. The exact Algonquian dialect or language with this exact regular sound change is not known, though there are no other instances of *ht → $hts\check{}$ for PEC, or → $ts\check{}$ for Innu dialects (or $ts\check{}j$ for the Mamit subdialect). This is reminiscent of Proto-Germanic *$paþaz$ (path) likely being an early Scythian (Iranian) borrowing[17]. Algonquianists disagree as to the date of this borrowing – though the term is easily reconstructible as a compound of *$aʔt$ (“set in place”) + *$-a{:}py$ (“string”), the invention of the bow very likely

17 In a similar vein, there is also some evidence that the characteristic pattern of development of dorsal stops spread from Indo-Iranian to Balto-Slavic after they had begun to diverge (Ringe, Taylor & Warnow 2002:109).

postdates the breakup of PA, hence Costa (2005)'s guess that because this word has "several unresolved phonological glitches in the daughter languages" and "has an odd geographic distribution", it was likely formed later in the post-PA period and passed around the rest of the family after the languages were already dialectally differentiated.

(16) PA: *ahta:pya 'bow'
CNEC: ahchaapii
CSEC: ahchaapii
Innu: atshapi
Sheshatshiu: [a:tʃa:pi:]
Mamit: [a:tʃja:pi:]
Uashat: [tʃa:pi:]
N: aahchaapiiy



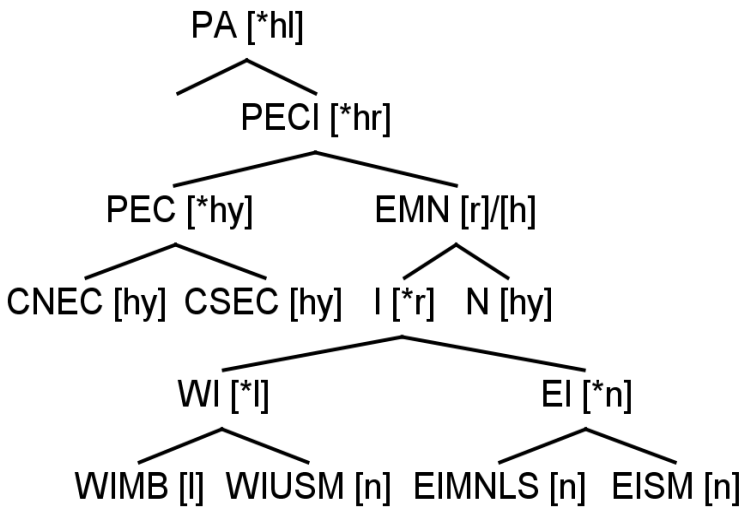
As for **hč*, we have the East Cree dialects and Naskapi that are once again the more conservative ones, having kept this cluster intact, and we see that Innu shifted to a plain voiceless postalveolar fricative, likely via an intermediate unaspirated voiceless postalveolar affricate *č*, with certain Central Innu dialects such as Unaman-Shipit having further weakened this erstwhile-innovative fricative to [h]. Due to the conservatism of Naskapi, we must assume, as does Harvey (2005:31-32), that EMN had *hč* as well, though orthographically it was represented as /tch/ by Silvy such as in *m8etch* 'strongly, entirely' (PA **mwe:hčih* 'certainly'). From its PA proto-form, it is clear that the changes can be explained through some intermediate stages, with relatively minor sound changes (deaspiration and deaffrication [č] → [š], with some Eastern Innu dialects undergoing debuccalization to [h]). The sound change rules are given in (19).

(17) PA: *axpi·hčya·wi 'distance'
CNEC: piihchauu 'it is a long distance'

(18) *ča:hčya:mowa 's/he sneezes'
aayiyimuu

CSEC: ispihchaau ‘it is so far/a certain distance’	aayimweu
Innu: ishpishinakuan ‘it is at a certain distance’	animu
Unaman-Shipit [ihpɬihɬnaːkwan]	
Pessamit [iːʃpəʃnaːwn]	[aːləmu]
N: piihchaaw ‘it is a long way, far to travel’	iyaayimuw

(19) WIMB: hč → č → š
WIUSM: hč → č → š
EIMNLS: hč → č → š → h
EISM: hč → č → š



Finally, we see **hl*, a rare cluster (occurring in only one PA morpheme according to Goddard 1979:72; Oxford (2019:fn1) remarks that its reconstruction is “tenuous”), which undergoes some considerable change across the dialects – East Cree keeps the first segment, and the liquid shifts to a glide -y, the ascendant of the Innu dialects must have collapsed this cluster into **l*/**r*, since we see the expected *n*/*l* distribution in the modern dialects, which is essentially another separate instance of rhinoglottophilia. Harvey (2005:61) hypothesized **hl* → **hr* → *h* as a possible sound change mechanism, though he notes that the 17th century texts sometimes use /h/ and /r/ - it is possible that the compilers of these wordlists captured some contemporaneous variability within the speech community. A summary of the sound change rules is given in (21).

(20) PA *le:hle:wa ‘s/he breathes’
EMN: rehan/nehan/reran
CNEC: yaahyaau
CSEC: yehyeu
Innu: neneu [ne:ne:w]
WIMB: [le:le:w]
N: yaahyaaw (Davis Inlet subdialect: ne:ne:w ~ ne:w ~ ne:yu:)

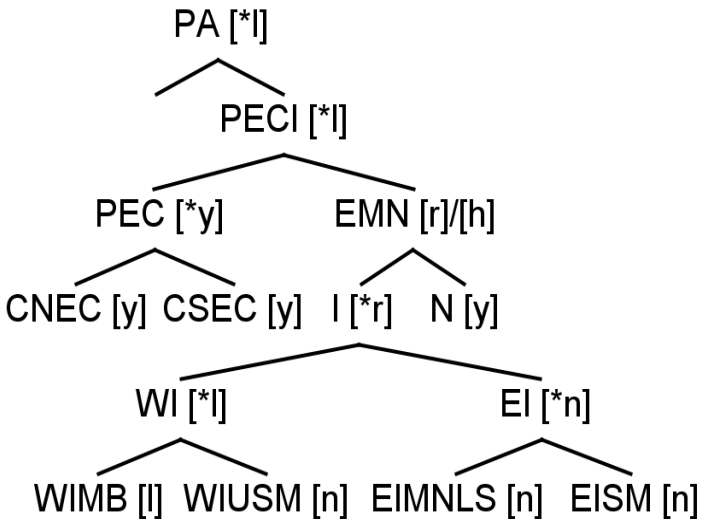
(21) East Cree: hl → hr → hy
WIMB: hl → hr → r/h → l
WIUSM: hl → hr → r/h → l → n
EIMNLS: hl → hr → r/h → n
EISM: hl → hr → r/h → n
Naskapi: hl → hr → r/h → hy

We can be fairly certain that the exceptions here are due to contact phenomena – in terms of cladistic reconstructions, pure borrowings (lexical), completely accidental shared innovations, and areal changes are sources of noise. As MacKenzie (1982:41) states, it is to be expected that those communities which are near the area of use of a different reflex show less homogeneity. Once we can clear up this confusion from the data, we can see the linkages from the point of view of the west-to-east cline model for this dialectal continuum.

3.2. Diachronic Development of *l + Clusters

PA	*l	*nl	*ʔl
PCA	*l	*hy	*hy (?)
EMN	r (rarely h)	h (rarely r)	h / r
CNEC	y / i	n	hy
CSEC	y / i	n	hy / h
WIMB	l	n ~ l	l
WIUSM	n	n	n
EIMNLS	n	n	n
EISM	n	n	n
N	y	n / h~y	hy / n~y

Figure 5: Table showing the reflexes of the PA *l and related clusters



We now come to PA *l, which is the litmus test for determining the main dialectal groupings. For initial and medial *l, the East Cree dialects and Naskapi shift to y (or marginally as -i- with the necessary resyllabification in East Cree), and either n or l in Innu. There are no instances of final *l. In some border communities, there is synchronic variation between n and y so that one may be substituted for the other by some speakers (MacKenzie 1982:44), though these are instances of PA *Cl or *n. An n which is a reflex of PA *l never alternates with y within a dialect. In the 20th century, there exists recorded variation within the Central Innu dialects (WIUSM), in which n steadily gained ground. Michelson (1939:71), reporting on fieldwork carried out on the North Shore of the St. Lawrence in 1937, stated that the region from Mingan to Godbout (west of Uashat) was a "mixed n and l area". By 1974 when Cowan recorded his data, there was little trace of l at Mingan but at Uashat, he recorded *lelew* for *ne:new* 's/he breathes' (examples with cognates given in (20)) and 'plesis' for *pineshish* 'small bird'. Ford (1976) referred to a mixed l/n dialect with a predominance of n forms for this same community and Drapeau (1979) reported that the *l*-dialect there is on the way to extinction. MacKenzie, writing in 1982, mentions that the Schefferville community, who are closely related socially and linguistically to the residents of Sept-Îsles (Uashat), make the substitution of l for n much less frequently than the latter and disparage this practice at Uashat, so there clearly was stylistically-motivated and sociologically-conditioned variation.

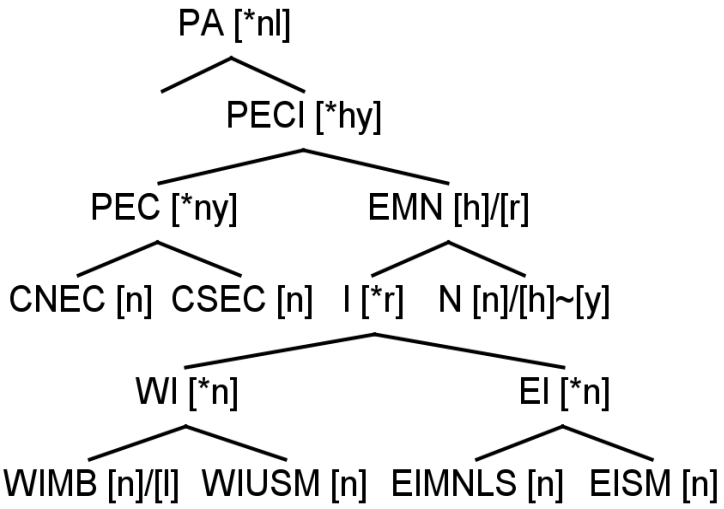
(22) PA: *lala·watwi 'it is destroyed'
CSEC: iyaayuun 'it is no longer usable, is ruined, it spills over'
CNEC: iyaayuwin 'it is ruined, it spills over'
Innu: nanun 'it is spoiled, unusable, inedible'
Pessamit: [laːluːn]
N: iyaayuun 'it is no longer usable, spoiled, ruined'

(23) PA: *a·lahkona·wa 'bread'
(Western Cree: aːyahkonaˑːw bread, bannock
Ojibwe: aːnakkonaˑ sea-bread, biscuit)

CNEC: aaihkunaau ‘bannock, cake’
CSEC: aaihkunaau ‘bannock’
Innu: anauakaikan ‘bannock cooked in the sand’
Unaman-Shipit [anaːwaːkeːjkan]

(24)

East Cree:	l → y
WIMB:	l → r/h → r → l
WIUSM:	l → r/h → r → l → n
EIMNLS:	l → r/h → r → n
EISM:	l → r/h → r → n
Naskapi:	l → r/h → y



**nl*[18], as with **hl*[19], shows up as /h/ in EMN, though Silvy (1974:106)’s wordlist also shows *r*. All modern East Cree, Innu, and Naskapi dialects have the *n* reflex here, though with one caveat: the Pessamit subdialect of Southern Innu has some partial merger with *l* – this could be a synchronic confusion of the two phonemes (compare (27) and (28)). It is interesting to remark that the Naskapi dictionary used for these data contains an extra note which says that *h* can also be *y*.

(25)

PA:	*ešinlehkawesowa
CSEC:	ishinihkaasuu ‘s/he is named’
CNEC:	isinihkaasuu
Innu:	ishinikashu ‘s/he is named as so’
Sheshatshiu	[iʃɬniːkaːʃu]
Mamit	[ihɬniːkaːhu]
Uashat	[iʃɬnəkaːʃu]

(26) *ki·nlyi·wi ‘it is sharp, it is pointed’

kaayuwin ‘the blade/point is sharp’
tshinau ‘it is sharp, keen-edged’
[tʃiːnaːw]
[tʃiːnaːw]

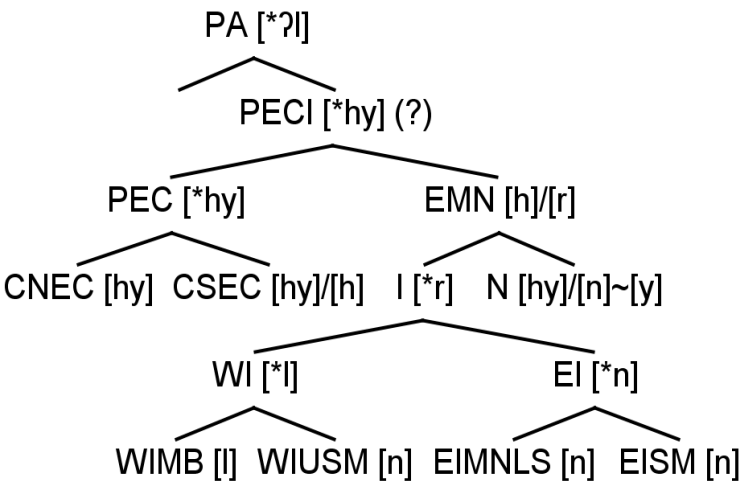
18 Very early in its history, **l* and **nl* both become *h* in the last syllable if no morpheme boundary immediately follows (Pentland 1979:366), PA **wa:pantanlwe* ‘(thou) look at it’ > Western Cree *waapahtah*, Innu *uapateu* ‘s/he sees his/her tracks’.

19 Pentland (1979:96-97) suggests an intermediate **hh* stage for consonant clusters ending in **-l*.

	Pessamit [iːʃənəkaːʃu]		[tʃiːnaːw]
	N: isiniihkaasuw		chiinaau (MacKenzie 1982)
(27)	PA: *noːnleːwa ‘she breastfeeds (trans.)’	(28)	*wiːnleːwa ‘s/he names him/her’
	EMN: n8hau		8ihau / 8irau (Fabvre:232)
	CNEC: nuunaamaau ‘s/he sucks it’		wiihaau
	CSEC: nuunaameu		wiiheu
	Innu: nunameu ‘s/he suckles it’		uineu
	Pessamit: [nuːnaːmeːw]		[wiːleːw]
	N:		wiihaaw, Davis Inlet: wiːneːw

(29)

East Cree:	nl → hy → ny → n
WIMB:	nl → hy → h/r → r → n → n/l
WIUSM:	nl → hy → h/r → r → n
EIMNLS:	nl → hy → h/r → r → n
EISM:	nl → hy → h/r → r → n
Naskapi:	nl → hy → h/r → n/h~y



Our last consonant cluster involving **l* is **ʔl,* which exhibits interesting variation. Note the borrowing of the *y*-form for certain words in Mushuau and the Davis Inlet subdialect of Naskapi (see (31) and (32)). Brittain (2001:9) states that there is a difference between the speech of successive generations among the Naskapi – younger speakers are borrowing phonological features and lexical items from the Schefferville subdialect (part of WIUSM), with whom the Naskapi have lived in close contact since 1956 (MacKenzie 1980) after the forced relocation from Fort Chimo on the Hudson Strait. The Schefferville variety has become the prestige dialect among younger speakers, so much so that older speakers comment that the young “sound more like Montagnais” and complain that Naskapi is being “corrupted” (Brittain, *ibid.*).

(30) PA: *aʔlapya (‘net’)
EMN: arabi

CNEC: ihiipii
CSEC: ahiipii (coastal), ahapii (inland)
Innu: anapi
Sheshatshiu [aːnəpiː]
Mamit [aːnɬpiː]
Uashat [nəpiː]
Pessamit [ləpiː]
Mushuau [aːyaːpiːn]
N: aahiipiiy (Davis Inlet ayapin)

(31) PA: *aʔleːwa (‘s/he places him/her’)
CSES: aheu, ahyeu (Mistissini) ‘s/he places it (anim) somewhere’
Innu: aneu ‘s/he places it (anim); s/he seats him/her’
Mamit-Sheshatshiu [aːneːw]
Uashat [neːw]
Pessamit [leːw]
N: aahyaaw ‘s/he places him somewhere’, but note Davis Inlet aneːw

(32) PA: *waːʔlawi ‘distant’
CNEC: waahyiu ‘far, distant’
CSEC: waahyuu ‘in the distance, far away’
Innu:
Sheshatshiu
Uashat
Pessamit
N: waahyuw (Davis Inlet waːnuː ~ waːyuː)

(33) *mesiʔleːwa ‘turkey’
mishihyeu
mishineu
[məʃiːneːw]
[məʃɬneːw]
[məʃəleːw]

Loanwords from French or English typically use the reflex of the first group that initially borrowed the term – for example, in Mistassini, an inland CSEC subdialect which has close links with the *l*-dialect of Mashteuiatsh (Pointe Bleue, part of the WIMB *l*-dialects, see (34)), *l* occurs in loanwords from the latter and is also the sound used to represent the English *r*. Other *y*-dialect communities use *n* in this situation (MacKenzie 1982:41), except for Naskapi which uses *y* (34). Interestingly, communities with English instead of French as their main secondary language sometimes remove the ne-/le- prefix borrowed from the fused French article (36).

(34) from French *les gâteaux* ‘cakes’
Innu: nekautu
Uashat: [neːkaːwtu]

Ekuanitshit: [neːkaːwtu]
Sheshatshiu: [neːkaːwtu]
Pessamit [leːkaːwtu]
N: iyaakaautuw

(35) from French *des crêpes* 'pancakes'
CNEC: paanikiik (from Eng. 'pancake')
CSEC: paanikiik
Mistassini: tekalep
Innu: tekanep
Mamit [teːkaneːp]
Uashat [teːkneːp]
Sheshatshiu [teːkneːp]
Pessamit [teːkəleːp]
N: paanikik

(36) from French *l'autobus* 'bus'
tuupiish
netupiss
[neːtuːpiːss]
[leːtuːpiːss]
tuupiis

We are left with the following sound changes:

(37) East Cree: ʔl → hy → hy → hy/h
WIMB: ʔl → hy → h/r → r → l
WIUSM: ʔl → hy → h/r → r → n
EIMNLS: ʔl → hy → h/r → r → n
EISM: ʔl → hy → h/r → r → n
Naskapi: ʔl → hy → h/r → hy/n~y

The literature does point to a general consensus which supports the proposition that there was a diachronic change from *r* to *l* in the Southern Innu (WIMB) area. According to Thwaites (1901), the first Jesuit missionaries that went into that area recorded an *r*-dialect; by the late 17th century, we start seeing a few instances of l in the dictionaries of Silvy (c. 1678) and Favre (c. 1695). The editors of the Silvy dictionary pointed out that by the end of the 18th century, reference works and religious books written in the r-dialect were no longer appropriate for the Tadoussac area (MacKenzie 1982). In a 1766-67 prayer book that was written in an Innu dialect in which *r* was still written, La Brosse (18th century priest) mentions that "they [the Innus] have the habit of pronouncing indistinctly *n*, *l,* and *r* in certain words... we have adopted *r* as purely Montagnais" (our translation, quoted in its original French in Harvey 2005:60), which suggests that, at least in the later half of the 18th century, there was a certain amount of confusion, perhaps either due to having multiple native speaker consultants of different regional subdialects, or due to seeing a language shift occurring in (then) real-time, hence our tentative reconstruction as **r*/**h* in (24). By 1845, *l*

was the most frequently used reflex of PA *l and r was "not understood" (Cooter & Simard 1974:xxi), though according to Cowan (1979), r may have lasted up until the beginning of the 20th century; today, it is heard only in Atikamekw, characterized by Pentland (1979) as a dialect of Cree (Cowan 1983:406).

The alternative forms of words containing PA *l given in the EMN (presumed to be Tadoussac-area Montagnais) dictionaries raises an important issue – namely, why in some cases the reflex is r and in others h? What is apparent in the data is that for *l and each of the three *Cl clusters, there are two reflexes: r and h. The former is by far the most common reflex of *l, while the latter is the most common for *hl, *nl, and *$ʔl$ (Harvey 2005:63). Fabvre, who wrote his wordlist almost two decades after Silvy, tends to show more h-l variation than does Silvy, indicating that by the time Silvy was compiling his lexicon, the situation was just beginning to become synchronically unstable.

Harvey (2005:64) offers three possible explanations for this variation: 1) these Jesuit priests simply misheard their informants; 2) h could have been silent or a y from an East Cree dialect; or, 3) the possible emergence of a new reflex of *l, and consequently a short-lived h-dialect. The third point is bolstered by the fact that historically, at the western fringes of Innu close to the inland communities of East Cree, there were indeed speakers that pronounced *l as h (notice how the inland dialect form of (30) is closer to their Innu cognates). Speakers of this dialect, holds Harvey, were present at time of Fabvre's data collection, but had not corroborated as much with Silvy, or had been assimilated into the r-dialect by that time, though the short time gap makes this less plausible. Thus there was putatively a central Québec isogloss running north-south, with the eastern portion retaining their r (or n) for all cases of *l, and a western portion that was increasingly turning to h, remnants of which can be seen in East Cree's *$ʔl$-derived h reflex as in (31).

3.3. Concluding Remarks

After a thorough examination of phonological condition with the data that we have, it is not possible to rule out that Fabvre recorded contemporaneous variation in the community and that one set of variants lost out. Moreover, upon scrutinizing the 17th century data, there remain some (morpho-)phonological conditions which are undiscovered which may explain why there was some kind of synchronic h/r variation. From the h-clusters, the diachrony of *hl is most intriguing and *l, *nl, *$ʔl$, exhibit numerous instances of reanalysis which we address in section 4.1.

We have also examined whether these changes have morphophonological relics[20] in the modern dialects – barring some expected phonetic changes (such as the hp/p alternations in the East Cree dialects in initial environments), all the changes we have examined are complete and apply under all conditions. Furthermore, other than the occasional borrowing as seen in examples (16), the Mamit subdialect examples where *-hk-* appears to be maintained, and the Davis Inlet subdialect of Naskapi example at (28) of an unexpected *-n-* instead of an *-h-*, we lack historical evidence of morphophonological echos (such as suppletion or unusual allomorphy).

How do these findings bode for our reconstruction? For any tree-like model, pure borrowings (lexical), completely accidental shared innovations, and areal changes are sources of noise. As MacKenzie (1982:41) states, it is to be expected that those communities which are near the area of use of a different reflex (referring to *n*, *l*, and *y* surface forms) show less homogeneity (such as certain Labrador Innu subdialects that have reflexes that should only exist in Naskapi or vice-versa). Once we take the sociological and historical realities of early 20th century forced sedentarization (the reservation system) into account, we can see linkages form from the point of view of the west-to-east cline model for this dialectal continuum – meaning a break-up or calcification of the waves, or an interruption of the constant two-way feedback between the closely related branches.

However, as many have noticed in the past few decades (Bynon 1977, Ringe, Warnow, & Taylor 2002, Kalyan, François & Hammarström 2019), the advantages of the tree model come at the cost of making a very restrictive assumption: namely, that language families evolve primarily by splitting, with subsequent loss of contact (Fitch 2005:179 for analogous reasoning in biological taxonomy). Put another way, the tree model[21] assumes that once two speech varieties have started to diverge, it is no longer possible for innovations to diffuse from one to the other. This assumption excludes the possibility of overlapping subgroups (Kalyan & François, 2014), something directly countered by the development *r*/*l*/*h*/*n* reflexes across CMN dialects. Ringe, Warnow, & Taylor (2002:108) also warn that very large geographic dialect continua cannot be insightfully represented by the tree model.

20 In West Cree, there is one relic of this sort – in inanimate plurals, but nowhere else, PA **-ali* had changed to **-ahi*, then later *-ah* (Pentland 1979:96), e.g. PA **wetayemali* 'his dog' > Western Cree *otēmah*..

21 In order to shore up the many shortcomings of the tree model, many proposals have been made in the literature, such as "tree envelopes" (Southworth, 1964), "isogloss maps" (Anttila, 1972), "truncated octopus-like trees" (Hock, 1991), "NeighborNet" (Bryant et al.. 2005, which is more an algorithm implementing an alternative to the tree model than an alternative model in itself); "trees with contact edges" (Nakhleh et al. 2005), "glottometric diagrams" (Kalyan & François, 2019, see Kalyan & François, 2014:183 for an example of a glottometric diagram of the Torres– Banks languages), and many others, none of which have been widely accepted. One desideratum for further research is a comparison of various phylogenetic methods applied to Algonquian.

One last note is that a linkage[22] can be seen as a derivative of a wave – innovations diffuse in intersecting patterns, leading naturally to the formation of overlapping subgroups. The bulk of the examples of linkages in the literature can be seen for the Oceanic languages (Gray et al., 2009) of northern Vanuatu (François, 2011) as well as those of Fiji (Geraghty, 1983, without having used the term) and of Polynesia (Smith, 2017) – the common element here is the presence of islands[23]. A very good case can be made that the imposition of a reservation system is the land equivalent of islands – essentially, the fuzziness that formerly characterized the different closely-related dialects was progressively eroded given that all speakers (at first with a high degree of inter-speaker variation, such as the historical presence of the *r* reflex) of a particular variety were corralled into reservations, and radical lifestyle changes brought about by government interference and a corresponding decline in hunting, foraging, inter-group trade, fishing, angling, worship, and other traditional activities which were predicated on long-distance mobility.

4. Analysis and Discussion

4.1. Rhinoglottophilia

The term *rhinoglottophilia* was first coined by Matisoff (1975) – a phenomenon describing an initially remarkable affinity between features of nasality and the articulatory involvement of the glottis which are documented synchronically and diachronically in a number of unrelated languages, such as in the Kra–Dai languages Thai and Lao, Lahuo (Sino-Tibetan), Lahu (belonging to the Loloish branch of the Lolo-Burmese subgroup of Tibeto-Burman), Lisu (a Loloish language closely related to Lahu), East Gurage (a Semitic language of Ethiopia) and Yiddish (West Germanic; with borrowings from Hebrew), Basque[24] (isolate, Igartua 2008), Avestan (Clayton 2021) and in certain upper-class dialects of English, e.g. half [hɑ̃ɑ̃f], heart [hɑ̃ɑ̃t] (Matisoff 1975:266-9).

22 Linkage too has its detractors – as Jacques & List (2019:139) contend, Ross (1988) uses the term "linkage" to refer to closely related language varieties that diffused rather than separated and uses specifically marked "multifurcating nodes" (also known as "polytomies") to highlight them in his genetic subgrouping of Oceanic languages. Kalyan & François (2018) criticize this solution as unsatisfying, emphasizing that polytomies mask that innovations can easily spread across dialect networks (as we perhaps see with the early spread of the l reflex, which radiated outward from the southern tip of the Southern Innu grouping, and the later spread of n from the Central Innu grouping), thus creating intersecting, fuzzy subgroups. The compromise solution proposed by historical glottometry is to use the classical comparative method to collect shared traits, supposed to represent exclusively shared innovations, for the language family under investigation, and to display these traits as weighted isogloss maps in which weighting is represented by the thickness of a given isogloss (Jacques & List, *ibid*.). But this makes for an increasingly messy and computationally intensive model.

23 This is not an absolute, as we note that non-island situations have been analyzed as linkages, such as Toulmin (2009) for the Kamta branch of Indo-Aryan and Magidow (2013) for Arabic dialects.

24 Basque, whose historical precursor had a nasal segment (namely /n/) in certain positions within the word. Latin loanwords in Basque like *ahate* 'duck' < *anāte(m)*, *ohore* 'honor' < *(h)onōre(m)*, and *liho* 'linen' < *līnu(m)* clearly reflect this diachronic correspondence between the alveolar nasal and the aspiration (whether nasalized or not) (Igartua 2015:636).

The chief goal of this section is to demonstrate that, in the light of rhinoglottophilia, the Innu diachronic correspondence $h > n$ can find the necessary typological support within a continuity approach that accepts the historical derivation of a nasal sound from an aspirated or laryngeal source, even if this path of change has not historically been widely acknowledged in the literature (Merlingen 1977: 195–203, Boretzky 1984: 23–25, Blust 2000: 94–95; in this context Hurch (1988: 129) represents an exception), though there are increasing numbers of phonologists who now acknowledge rhinoglottophilia.

This term is not to be confused with *glottorhinophilia*, first appearing in Maolalaigh (2003) but described earlier as a natural corollary of rhinoglottophilia (Blevins & Garrett 1992, 1993), which describes the natural corollary to rhinoglottophilia, where phonetic and acoustic theory allows for the development of voicelessness in nasalized environments, such as in the development of Irish voiceless glottal fricative [h] which frequently occurs in the intervocalic position either following or between nasalized (or what may be assumed to have been originally nasalized) vowels in the position once occupied by a historical nasal consonant.

In Sprigg (1987), there is a discussion behind the theoretical motivations that try to explain why certain languages have reflexes of lexical items that seem to involve a radical sound change – in one example, he gives Arakanese [ɕi]/[ɻ̥ĩ]/[hɻ̊]/[hĩ], and most commonly in informal speech, [hɰ̃]. By elaborating on Pike (1943), he proposes two types of friction which function very differently and have different origins – the first results from stricture at a single local point, and the second is due to cavity friction (meaning, voiceless resonance of a chamber as a whole caused by air going through it as through an open tube). By the interplay of these two types of friction accompanied by the raising or lowering of the velum, Sprigg suggests that we can arrive at something approximating this schema:

() first type: [h] and voiceless vowels
second type: [ɦ] and voiced vowels and any corresponding voiced non-syllabic vowels

Essentially, instead of having three cavities (oral, pharyngeal, and pulmonic), a fourth one (nasal) is added as a kind of excrescence or articulatory byproduct. Thus, the second type of friction may be easily nasalized by some speakers of the same dialect, or across various closely-related dialects but not others.

> A slightly open glottis allows some coupling of the subglottal cavity to the oral cavity (comparable to the coupling of the nasal cavity to the oral cavity during nasal sounds) and results in anti-resonances which, when they interact with the resonances of the oral cavity, increase the bandwidth and lower the amplitude of the first resonance [...] Such

> effects coincide with some of the acoustic cues for nasalization on vowels. (Ohala 1983:233)

As Ohala (1993) later put it, this sort of pseudo-nasalization may be misinterpreted by listeners as actual nasalization – thus children may them learn, by error, a phonemic distinction between the non-nasalized and nasalized sounds. This has also been called *spontaneous* or *independent* nasalization in the vicinity of high-airflow voiceless consonants (Maolalaigh 2003). Matisoff (1975:269) also mentions "velic lassitude" and attributes the fact that raising the velum requires a certain amount of muscular effect, for the explanation as to why certain speakers tend to nasalize a certain category of sounds. Heffner (1952:113) takes a contrary view, and believes that a nasal twang becomes part of the basis of articulation.

Put another way, rhinoglottophilia is an instance of listener-based sound change which originates when a listener misperceives or misparses the acoustic signal produced by the speaker, arriving at a representation which differs in some respect from that intended and encoded by the speaker (Hansson 2008). The phonologization (Hyman 1977) of such misapprehensions on the listener's part thus provides a channel through which articulatory, aerodynamic and acoustic-perceptual factors come to shape phonological systems. According to Hansson (2008:5), Ohala's fundamental insight is to attribute a variety of sound changes (rhinoglottophilia and glottorhinophilia included) to "normalization gone wrong", as it were, where a listener either fails to correct for a contextual effect or wrongly attributes some intrinsic property of a segment to contextual influence.

The affinity between nasality and glottality (especially aspiration), which is manifested by the remarkable proximity of their acoustic effects (Igartua 2015), provides an excellent explanation for the study of the Innu-Aimun reflexes in question. Based on what Ohala (1983: 233) has noted regarding the spontaneous nasalization of vowels – which occurs most frequently when vowels are adjacent to consonants characterized by heavy airflow, such as the glottal fricative [h], voiceless fricatives and affricates, and aspirated stops, i.e. *h*, *ch*, *s*, *c, t* etc.; for our case, we can add preaspirated stops and clusters involving *-l-* (which also lowers the tongue root) as in (21) and (29).

Natick (or Wampanoag), an Eastern Algonquian language once spoken in Eastern Massachusetts, maintains a distinction between PA **θk* and **xk* – a distinction which the Central languages do not keep (Siebert 1941). Silver (1960a) notes that in Siebert's discussion of PCA **θ* and **l*, he notes that the New England languages have /l/ for both, thus implying that Natick also has an /l/ - Silver suggests that Pre-Natick may have had an /l/ and an /n/ but, if so, these two phonemes had coalesced by the time of the first transcriptions of Natick.

This leads into an interesting parallel between the Innu-Aimun dialects and Southern New England Eastern Algonquian languages is the fact that a similar /r-l-n-y/ variation occurred, but for a different proto-phoneme than what we see in Central Algonquian. In both dialect groups, we see similar triggers for rhinoglottophilia.

	PA	PEA	Natick	Narragansett	Nipmuc	Mohegan-Pequot	Quiripi
Initial	*θ	*r	n	y/n[25]	l	y	r
Medial	*θ	*r	n	y	l	y	r

Figure 6: Southern New England Eastern Algonquian cross-dialectal reflexes of PA *θ.

Judging from the repeated intercrosses between [n] and [h] at (21), (24), (29), and (37), we can posit that the East Cree/Naskapi/Innu-Aimun dialect continuum has experienced both rhinoglottophilia and glottorhinophilia. The data seems to suggest that neither phenomena are unidirectional. Although sound change (including perceptually-based sound change) is typically asymmetrical (Garrett & Johnson 2013:64), in phonological substitutions triggered by rhinoglottophilia (Igartua 2015) and its opposite, our data suggests a certain degree of symmetry in misperception. Whatever the direction of change, the replacement of one segment by another is governed by listeners' perceptual activity and may thus be ascribed to confusing acoustically similar sounds.

The written records only mention of a certain degree of variation or confusion between $r/h/l$ and n, and never mention the nasalized quality of surrounding vowels. If we are to apply the rhinoglottophilia analysis as seen in Basque (Igartua 2015, with some modifications) for the post-18th century $r/l > n$ changes, we could reconstruct several intermediate stages in a sequence as follows:

	1		2		3		4	
-V.rV-	>	-V̰.rV̰-	>	-V̰.r̃V̰-	>	-V̰.nV̰-	>	-V.nV-
-V.lV-	>	-V̰.lV̰-	>	-V̰.l̃V̰-	>	-V̰.nV̰-	>	-V.nV-

Figure 7: Attempt at reconstructing acoustic misperception in four stages.

Processes involved:

1. Nasalization of surrounding vowels
2. Acoustic reinterpretation (by misperception) of r/l as a nasalized segments
3. Full nasalization of lateral or rhotic.
4. Loss of vocalic nasalization

25 Williams (1936:104-105) interchangeably mentions both, including in examples, such as nòte or yòte, 'fire' (Costa 2007:92). This could be due to a speakers of different dialects of Narragansett.

For the specific innovations that concerns us here, outlined in section 3, we reason that the acoustic reinterpretation of a nasal segment as an aspiration (whether nasalized or not), can be understood as a phonologically abrupt change, as described by Igartua (2015:656), "a replacement of segments motivated by listeners' perceptual activity". The four steps described above in Figure 7, if they ever did occur, must have necessarily occurred in quick succession – no more than a generation (Hansson 2008 also suggests that such phonologizations should occur more often in childhood). Igartua (2015:655) and Bybee (2012:226-227) do not commit to a model of sound change as depicted in Figure 7, since a distinctive feature of this kind of sound change is its abrupt character which defies an account in terms of articulatory gradualness. To borrow an idea in the grammaticalization literature – Hopper & Traugott (2003) explain that changes can be interrupted, stopped, become reanalyzed, or become phonologized differently at any point. This type of reasoning seems to apply to seemingly abrupt processes like rhinoglottophilia.

Postal (1968) understands change as equivalent to adding rule to a grammar[26] which would be able to explain all of phonology assuming we understand or discover every rule – here, we differ from such a rigid viewpoint given that the acquisition of a phoneme through misperception involves reanalysis and not a simple (or even a chain of) sound change.

What contrasts Innu-Aimun instances of rhinoglottophilia from those found in Basque and certain Celtic languages is that we have no surviving alternations – Basque, for example, has many alternations such as *mihi* ~ *min-* 'tongue', with an *-n-* preserved in word formation processes (cf. compounds like *mingain* 'tongue, top of the tongue',) or in word final position (cf. *arpin* 'plantain' < *ard(i)-bini[27] 'sheep tongue'), unequivocally shows the origin of the intervocalic aspiration (Igartua 2015:650). Let us also remind ourselves that two of the three other ancient sources of EMN /ht/, namely PA **nt* and **nθ*, show no surviving alternations.

Barring easily identifiable loanwords, such changes are absolute in Innu and related dialects, which reinforces two additional points made by the literature: first, a constitutive property of sound changes based on perceptual confusion is its structure-preserving character (*ibid.*) (for another example, see the substitution of *θ* by *f* in certain British dialects, Bybee (2012:227), Garrett & Johnson (2013:72)). Second, as underscored by Bybee (2012:222-227) for natural language change and Dinnsen (1993:291) for clinical disorders, there is a significant difference between articulation-based and perceptually-motivated changes in terms of lexical

26 "Within a framework in which there is no explicit conception of phonology as a generative device which associates phonological and phonetic representations, it is easy to see how linguists could come to the erroneous conclusion that in order to indicate free variation, it is necessary to have a special level of linguistic structure whose strings permit such facts to be directly ascertained. This false conclusion is thus one of many extremely deleterious effects on modern linguistic work arising from the failure to give the notion linguistic rule its proper central place." (Postal, 1968:30)

27 Proto-Basque **bini* > **mini* > Modern Basque *mihi* (Blevins, 2018).

diffusion. Sound changes with an articulatory basis first affect high-frequency words, and then spread to low-frequency words, whereas changes motivated by misperception should apply indiscriminately across-the-board (i.e. without regard for derivational history or morphological composition, thus are typically exceptionless, Kiparsky 1982) akin to a postlexical rule. This explains why we lack morphophonological relics showing the older phonemes.

The WIUSM dialectal group perhaps show the most interesting diachronic journey, as we have at least one ambiguous period where more than one variant was present (the well-documented r/h variation): $l > r/h > r > l > n$. Here we have a tension between reanalysis and change (the mere addition of a rule to the grammar in the underlying form), given that, if there is an alternation with a conditioned environment in the language, then we need to have a rule to express that. However, if it is an instantaneous change (that is, if Fabvre and Silvy recorded different speakers from different areas), which we believe it to be, then it is reanalysis and thus we do not need to relate to changes in the grammar. This raises questions insofar as using synchronic phonology to explain all historical changes – the changes we see here may not be suitably modeled by theories of synchronic phonology. The inference is that we need to have a theory of sound change that supplements our theory of synchronic phonology, and this needs to be reconciled with the fundamental problem in synchronic studies: things are the way they are because of historical problems *and* because of the way our native grammars are acquired and formed each generation.

Bach and Harms (1972) use the term "crazy rule" to describe phonological processes that make no phonetic sense. Buckley (2004) states that they often arise from processes that were originally transparent phonetic effects, but whose result or conditioning environment has been obscured by subsequent changes (such as the crazy rule in Pomoan, which originated in the reanalysis of a morphological juncture, leading to a new phonological process.) We can only partially agree with the use of this term here, given that rhinoglottophilia involves misperception, and given that there does not seem to be any conditioning environment; however, it does make some phonetic sense, at least insofar as the auditory/perceptual medium is concerned.

Though certain authors have attempted to explain the appearance of aspiration from a nasal through a phase that contained an intermediate velar nasal with nasalization of the preceding vowel (Michelena 1977:302), Igartua (2015:654-5) finds it difficult to justify this sort of "saltational change" (a term which he borrows from evolutionary biology indicating a mutation that drastically changes the phenotype of an organism), preferring to regard the development of an aspiration out of a nasal as a phenomenon that has a perceptual basis. Thus, the affinity in the acoustic effect between aspiration and nasality may lead the listener to an "erroneous" association between this effect and the segment or the articulatory

movements that cause it, that is, an association that does not coincide with the one intended by the speaker (*ibid.*), hence the need to see such a problem from the viewpoint of a radical reanalysis.

4.2. Alternate theoretical frameworks

We will now very briefly cover alternate theoretical frameworks and in each case, explain why they must fail in accounting for the diachronic changes that we have analyzed.

4.2.1. Underspecification

Underspecification (Kiparsky 1982) is a theory about how speakers represent phonological information, while assuming that a language learner only has to acquire a minimalist set of features, leaving rules (universal for the most part, Archangeli 1984:42) to fill in the missing values. An underlying representation where a feature has specifications for all phonemes is ill-formed, hence the value in applying Underspecification Theory to asymmetrical phonological problems.

If nasals never could arise from a laryngeal environment (recall $*nl > *hy > h > r > n$), then underspecification could be useful as we could imagine a first division of the inventory as an obstruent-sonorant opposition, where we would divide the stops, affricates, and fricatives above from the nasals and liquids below. Within the sonorant group, nasals can be distinguished from the liquids /l, r/, represented by the inclusion of the former and finally, /l/ would be specified as a lateral, making it distinct from /r/ (see Dresher (2009:45) in general and Natvig (2020) for German).

Though the sound changes being what they are, if we were to adopt an underspecification framework, it is not clear that it would explain the observed sound changes any better. Then there's also the issue of first-language acquisition depending on specific phonetic signals – it is not clear how underspecification would address it. One potential advantage is that underspecification can be useful to explain the differentiation of children's underlying representations to the extent necessary to account for perceptual differentiations and across-the-board changes (Dinnsen 1993:300).

Analogous to one of the venues of tonogenesis, that is, voicing is converted to a tonal difference, we posit that the alternations in PA $*l$ reflexes cannot be dealt with in features. Change is not necessarily expressed as a change of feature, but a reanalysis or birth of a new feature. Therefore we need to discard Underspeficiation Theory for our purposes.

4.2.2. Contrastivist Hypothesis

The Contrastivist Hypothesis (Hall 2007) is a hierarchically determined model of contrast, which has been successfully applied to vowels in this language family (Oxford 2012a, 2012b, 2015, 2016) where the proposal is the following: the major diachronic patterns in the development of Algonquian vowel systems can be seen to follow naturally from a shift in the underlying contrastive structure of the vowel system (a "contrast shift", as defined in the Modified Contrastive Specification framework developed by Dresher, Piggott & Rice 1994; Dresher 2009).

Conceptually, the Contrastivist Hypothesis is a further development of Underspecification. This theory holds that there are contrastive feature specifications that are determined by dividing the inventory according to a feature hierarchy (Oxford 2012a:2). Following Ko (2010a, 2010b), Oxford assumes that only two phonemes that differ in the lowest-ranked feature that distinguishes them can fall together (i.e. a phoneme can only fall together with its "contrastive sister"), and also assumes that contrastive hierarchies may change over time.

If we were to draw a tree for PA consonants, it would look something like in Figure 8 (based on Li's (1999:8) constriction-based feature geometry). Under this framework, one is supposed to assign contrastive features by successively dividing the inventory until every phoneme has been distinguished (Dresher 2009)[28].

28 Dresher (2009:16) formalizes a method for assigning features to an inventory, the Successive Division Algorithm ("SDA"), arguing that phonological features sequentially contrast phonemic categories one feature at a time until all phonemes are distinct (Natvig 2020). The framework assumes that the phonology operates only on contrastive features, using phonological activity as the primary justification for proposing which features are contrastive for which phonemes (Hall 2007; Dresher 2009). The SDA has three steps:

a. Begin with no feature specifications: Assume all sounds are allophones of a single phoneme;
b. If the set is found to consist of more than one contrasting member, select a feature and divide the set into as many subsets as the feature allows for; and,
c. Repeat step (b) in each subset: Keep dividing up the inventory into sets, applying successive features in turn, until every set has only one member.

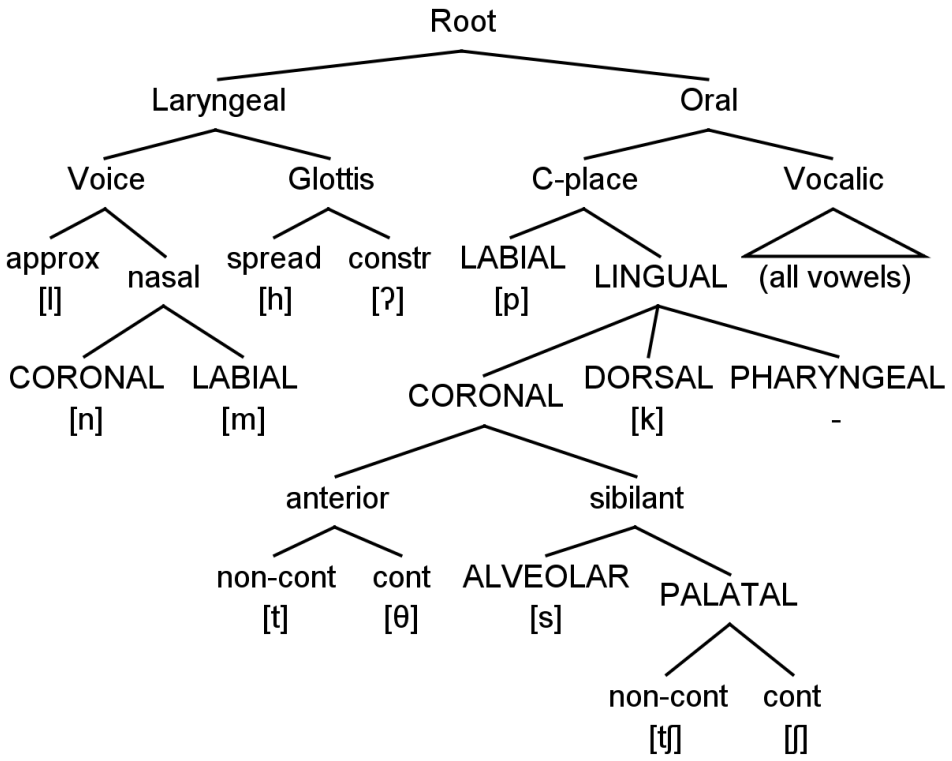


Figure 8: Constriction-based feature geometry for PA consonants.

Given the tremendous distance (in terms of features and the number of nodes required in the feature geometry in Figure 8) required to "collapse" branches, we must reject this analysis as far as CMN consonants are concerned. We have no way of discreetly changing the geometry, nor of collapsing particular sister nodes, without destroying the entire system. The labial node for /m/, for example, should collapse with coronal /n/ before the higher-level /l/ can collapse with /n/, which is something that has never occurred in Algonquian. Thus, we have no specific reason to believe that this model offers some kind of explanatory power. This raises questions insofar as using synchronic phonology to explain all historical changes – the changes we see across the CMN dialects may not be suitably modeled by theories of synchronic phonology, notwithstanding the claim that "viewing phonological change in terms of contrast shift accounts for large-scale phonological patterns that are hard to explain any other way" (Dresher et al. 2014:12).

4.2.3. Theory of the Life Cycle of Phonological Changes

Ramsammy (2015) and Bermúdez-Otero & Trousdale (2012), among others, have attempted to demonstrate how the theory of the life cycle of phonological processes can account for diachronic phonological changes in a stratal/cyclic model of phonology since it captures the fact that sound change operates in orderly stages[29] and that phonological processes become increasing integrated with morphosyntactic structure as they age, though phonological rules also often display different rates of application across a given dialect continuum and these developmental phases cause phonological innovation to define a template of language change. It can be said that these stages of change reflect synchronic patterns of microtypological variation.

This idea is not new – Schuchardt (1885) referred to "internal expansion" of a sound law by phonetic analogy, whereby an innovative phonological process expands diachronically by rule generalization, but this is constrained by phonetic pressures. Baudouin de Courtenay (1895) too believed that the grammar of a speaker was but a snapshot of an ever-changing system of rules, with coarticulatory effects arising from anatomical (physiological) constraints. These linguists and their modern contemporaries are essentially seeking to develop an amphichronic approach to phonology, where synchronic and diachronic explanation feed each other (Bermúdez-Otero 2015).

Our account of PA-derived **h* and **l* reflexes and their clusters in Innu-Aimun seem to fit well for the first stage – phonologization – that is, new sound patterns enter the grammar when a listener or learner misinterprets the effects of a purely physical or physiological phenomenon as being under the control of a speaker's grammar and so adjusts their phonetic implementation rules accordingly (this is close to Ohala (1981)'s concept for hypocorrection). Bermúdez-Otero (*ibid.*:11) then adds that empirically, phonologization becomes apparent through an increase of the (phonetic) effect beyond the magnitude warranted by extragrammatical causes; feedback and sociolinguistic incrementation may then further enhance the changes (d'Arcy 2015).

But this is where the utility of the theory of the life cycle of phonological changes ends for us. The changes we have analyzed appear to have an across-the-board effect – we have no evidence in any of the modern dialects of domain- or morphosyntactically-limited sound changes. This theory hinges on particular sound changes, even in cases of reanalysis, to go through numerous stages of domain narrowing. Bermúdez-Otero (2011:2024), as an example,

29 The stages being: epiphenomenal, gradient phonetic effect → phonologization → gradient phonetic process, under cognitive control → stabilization → phrase-level categorical phonological rule → domain narrowing I → word-level categorical phonological rule → domain narrowing II → stem-level categorical phonological rule → lexicalization/morphologization → lexically-stored information.

sees four stages of domain narrowing in the history of postnasal /g/-deletion from Early Modern English to the present-day, in which the postnasal /g/-deletion rule went from a non-rule, to a phrase-level (Early Middle period), then word-level, then stem-level rule, so that only a stem-internal /-ng-/ segments like in 'elo**ng**ate' remain in Modern English. For these two reasons, an account based on the theory of the life cycle of phonological changes must fail.

5. Conclusion

The current study set out to explore PA-derived *h and *l reflexes and their associated clusters and after having reviewed the historical population movements of the people who would later be known as the East Cree, the Innu, and Naskapi (as a secondary point, we argued in favor of a particular clade), we have laid out explanations as to why these sound changes are difficult to account for given the modern distribution of these phonemes. The strikingly different features found in the modern reflexes represent a challenge for diachronic mechanisms of sound change, which is why we proposed both rhinoglottophilia and its counterpart, glottorhinophilia, as sources of explanations for the reanalysis of laryngeal segments as nasals and vice-versa, which happened unevenly across the CMN-speaking subpopulations.

This paper contributes to a growing body examining rhinoglottophilia as an explanation for an intriguing diachronic sound change. This is also the first paper to mention rhinoglottophilia as a possible explanation for the curious sound changes in the CMN language complex. This is a case study in which rhinoglottophilia and, to a lesser extent, glottorhinophilia, have played a major role in reshaping the phonology of an entire group of closely related dialects. We propose that rhinoglottophilia and its rarer counterpart need to be recognized as an aspect of sound change as they cannot be easily reconciled as a treatment of feature changes. For future research, a comparison of various phylogenetic methods applied to Algonquian would be worthwhile, as well as production and perception studies regarding rhinoglottophilia to better understand the phenomenon in a controlled environment.

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