Ambisyllabicity and Nasalization in Chilcotin

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0. Chilcotin, an Athapaskan language of British Columbia, has six vowel phonemes, three pairs of tense (full) and lax (reduced) vowels. Because of the flattening process conditioned by flat sibilants (Ŝ) and flat velars (Q, Q^{w}), as described in Cook 1983 and elsewhere, each of these six vowel phonemes is realized phonetically in two (or more) qualities as shown in Table 1. The consonant inventory is given in Table 2.

TABLE 1

Underlying (sharp) (a)			Flattened (next to a flattened consonant) (b)		
i		u	ɪ̯$_{i}$, (e)		o
	ɪ	ʊ	ɪ̯$_{ɪ}$	ɔ̈	
	ɛ		ə		
	æ		a		

TABLE 2

1	2	3	4	5	6	7	8	9	10	11
b	d	dl	dz	dƛ	dž	g	G	g^{w}	G^{w}	
p	t	tɬ	ts	tɬ	tš	k	q	k^{w}	q^{w}	
	t'	tɬ'	ts'	tɬ	tš'	k'	q'	k^{w}'	q^{w}'	ʔ
	(n̥)	ɬ	s	ɬ	ɕ/c	—	x̣	x^{w}	x̣^{w}	h
m	n	l	z	ƛ	y	—	ɣ̣	w	ɣ̣^{w}	
N	N	N	S	Ŝ	N	G	Q	G^{w}	Q^{w}	N

Furthermore, both tense and lax vowels, either sharp or flat, have nazalized counterparts on the phonetic surface, which are phonemically interpreted as a sequence of a vowel followed by n. The remainder of this paper is concerned about the theoretical status of this interpretation.

1. The allomorphic variations of nɛ- (2sg subject prefix) in verbs illustrate the phonological behaviour of n and the process of nasalization. Compare the underlying and surface realizations of this prefix in the following four verbs. Other prefixes in these examples include 'adverbial' (adv), 'conjugation marker' (CM), and 'classifier' (C).

(1) a. gǽ - nɛ - t'ín [gæ̃nɛt'in] 'you do so'
adv - 2sg - do

b. nǽ - nɛ - džɛ́z [næ̃ndžɛ́z] 'you drag it'
adv - 2sg - drag

c. ɣ̣ɛ - nɛ - bił [ɣ̣^{ʁ}imbił] 'you are swimming'
CM - 2sg - swim

d. ɣ̣ɛ - nɛ - l - gɪc [ɣ̣^{ʁ}ɬlgɪç] 'you are walking'
CM - 2sg - C - walk

The underlying form of the subject prefix in question is intact in (a), it is realized by n in (b), by m in (c), and by the nasalization of the preceding vowel in (d). In order to put the rule of nasalization, exemplified by (1d), into proper context, it is now necessary to comment on other rules that are involved in the allomorphy of the 2sg subject prefix.

The derivations of the forms given in (1) include Metathesis, Reduced Vowel Deletion (RVD), Tensing, Nasal Absorption (NA), and Nasal Assimilation (NAS), all of which are shared by many Athapaskan languages. The relationships of these rules are illustrated by the following derivations (1b,c,d):

Rules	(b)	(c)	(d)
Underlying	nǽ-nɛ-džɛz	ɣ̣ɛ-nɛ-bił	ɣ̣ɛ-nɛ-l-gɪc
Metathesis	nǽ-ɛn-džɛz	ɣ̣ɛ-ɛn-bił	ɣ̣i-n-l-gɪc
Tensing/RVR	nǽ-n-džɛ́z	ɣ̣i-n-bił	ɣ̣i-n-l-gɪc
NA/NAS	—	ɣ̣i-m-bił	ɣ̣ɬ-l-gɪc
Other	nǽndžɛ́z	ɣ̣^{ʁ}imbił	ɣ̣^{ʁ}ɬlgɪç

The metathesis rule proposed here has not been well documented for Athapaskan (but see Cook 1986); instead a rule of vowel deletion is proposed for cognate processes (see Rice 1983 and Hargus 1985). A rule of vowel deletion, however, creates a couple of serious problems which will not be discussed here. A reduced vowel deletes next to a full vowel, but two like reduced vowels become a tense vowel, so that Tensing and RVR are mutually exclusive, which may be collapsed into a single rule. The nasal assimilation and absorption rules exemplified by (c) and (d) above, are of primary interest here. These two rules are also mutually bleeding.

A cursory examination of the nasalization in the above example suggests that Chilcotin nasalization is different from other cognate processes in Athapaskan (e.g. Slave, Sekani) or from the better-known rule of nasalization exemplified by French (Schane 1973, Foley 1977). One thing to be noted here is that the n that is absorbed by the preceding vowel is not syllable final but followed by a syllable-final continuant at the time when Nasal Absorption applies (i.e. ɣ̣inl → ɣ̣ɬl). This fact is further illustrated by the examples below. Compare those in (a) with those in (b):

(2)

(a)			(b)		
nɛnjæn cvn-cvn	[nɛnj̃æn]	'here'	nɛntš̃æɣ cvn-cvnc	[nɛntš̃æɣ]	'your rib'
hɛntš̃æɣ cvn-cvc	[hɛntš̃a(·)]	'you cry'	yæɬtɪg cvnc-cvc	[yæɬtɪk]	'you talk'
sæninqǽx cv-cvn-cvc	[sæniŋqǽx]	'give it to me'	ʔɛsɣ̣unc cvc-cvnc	[ʔɛsɣ̣ǔnç]	'wild carrot'

Since there is no syllable coda represented by n plus a stop in Chilcotin, it is apparent that the Nasal Absorption is triggered by a syllable-final continuant. There are, however, two types of apparent counter-examples to be discussed below.

2. In the phonetic data shown below, nasalized vowels occur where there is no syllable-final continuant.

(3) a. [dɬ(·)] '4' cf. [sɛlin] 'my dog'
b. [yɛdą(·)] 'long time' cf. [dæn] 'summer'
c. [ʔɛɬɣ̣ǫ(·)] 'he's snoring' cf. [nɛzun] 'it's good'

If [Ɣ] does indeed contrast with [Vn] as the above data apprently suggests, nasalized vowels should be recognized as phonemes. This would be an undesirable solution considering the rarity of [Ɣ] not followed by a continuant, the increase in the phonemic inventory, and the systematic alternation between [Ɣ] and [Vn] in verb paradigms, as illustrated by the data presented in (1). Furthermore, the recognition of nasalized vowel phonemes does not resolve the other problem revealed by (3b), the flattened quality of the second vowel where there is apparently no flat consonant. This leads one to an alternative solution.

What is obviously needed to resolve the problems of nasalization and flattening revealed by the data in (3) is an underlying continuant, and the most reasonable choice is a homorganic glide. With this somewhat less transparent segment, the phonetic data in question receives the following phonemic interpretation.

(4) a. diny '4'
b. yɛdæny 'long time'
c. ʔɛɬɣ̣unw 'he snores'

It is important to note that the final homorganic glide is independently motivated, at least for (4b). The final y triggers flattening of æ to [a] and also triggers Nasal Absorption, so that the underlying æ surfaces as [ą]. In other words, the choice of a homorganic glide is not an arbitrary one; it is motivated not only by Flattening, the most salient phonological process of Chilcotin (see Cook 1983 for details), but also by the heavy-light syllable alternation, which is quite common among the Athapaskan languages (see Cook 1977).

Another set of data that shows nasalized vowels not followed by a syllable-final continuant is given below. Note in the following phonemic (not morphophonemic) representations of the data, the syllables in question (which are underscored) are in the canonical shape of CVC where the second C is n.

(5) a. yimyiɬ [ɣ̣ʲiɣ̣ʲiɬ] 'you are backpacking'
b. dinlél [dɬlél] 'you are singing a love song'
c. gunzun [gʊzun] 'it (house) is good'
d. xugunɬæn [xogʊlæn] 'how often?'
e. ʔinɬi [ʔɬi] 'one'
f. sɛʔinɬɛʔ [sɛʔɬzəz] 'my buck skin'

In these forms, the n that is the syllable-final C is absorbed by the tautosyllabic vowel. Note, however, that the nasal absorption applies only if the onset of the following syllable is a continuant. It is, of course, possible to state the rule, making reference to this heterosyllabic onset, but then is Chilcotin nasalization so different as to be conditioned by a nontautosyllabic element? This question is answered in the following Section.

3. The core syllables of Chilcotin are given in (6), where V is a full Vowel, V̆ a reduced vowel, and C any consonant.

(6) a. CV: tu 'water', sa 'sun', qi 'shoe'
b. CVC: sid 'I', ɬin 'dog', nuɬ 'bird', san 'dress'
c. CV̆C: sɛn 'star', dʒɛɬ 'snow mountain', t'ʊg 'baby bottle', guc 'shirt'

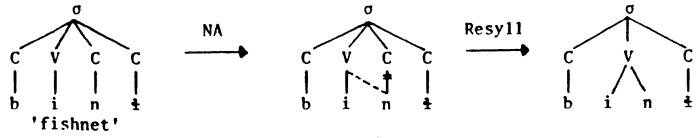
There is no syllable represented by V or V̆ alone, and syllables of the form CCV(C) or CVCC (except where the second C is n; see below) are extremely rare, while the VC type of syllables are limited to a few enclitics of no definable semantic content, e.g.

d. CCV(C): ɬdli 'pants', squnɬæ '5', ɬtc'æntæy '6',
e. CV(C)C: qʊyd 'beaver yearling', ʔɛɣ̣æyg 'fish bone'
f. VC: -an (copula), -as (copula)

Two points should be made with respect to these syllable types. First, it is important to distinguish CVC from CV̆C because reduced vowels never occur in open syllables, although there are morphemes of the shape CV̆, which require a rule of ambisyllabification (see below). I have deliberately left out CVnC [CɣC], which is the main concern of this paper.

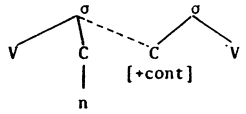
The noncore syllable types are extremely rare; in fact, examples listed above make up an almost exhaustive list. Furthermore, the membership of the initial clusters is restrictive; the first C of the initial CC is always s or ɬ, and the second C is a non-continuant. The status of the ɬ-initial cluster is not stable in that the cluster is broken by an epenthetic vowel in an alternative pronunciation. As for (6e), those two forms are the only examples so far recorded. The glides in Chilcotin (and in Athapaskan in general) function like a true consonant (see Cook 1977), while diphthongs are non-existent or extremely rare. However, ʊy and æy in the two forms in (6e) may be treated as diphthongs where there is a true syllable-final consonant, i.e.

With this analysis of what appears to be a CVCC syllable type, the only remaining CVCC syllable type is CVnC that becomes CVC (i.e. CɣC) via Nasal Absorption, e.g.

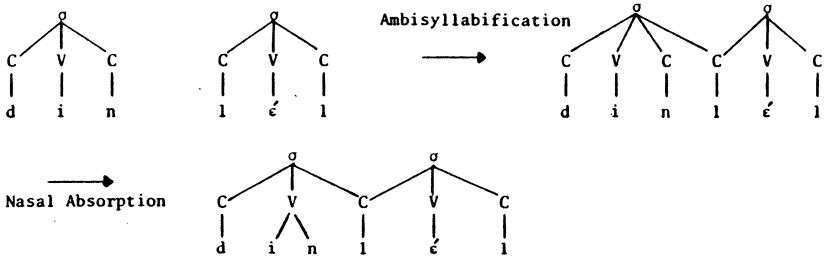


Needless to say, any sequence of a vowel plus n, dominated by a single V is phonetically interpreted as a nasalized vowel, and C that no longer dominates any segment is erased by a general convention.

The nasal absorption rule illustrated by the above derivation, however, cannot account for the data presented in (5), simply because the syllables in question all end in n not followed by a tautosyllabic continuant. This suggests, provided that the Nasal Absorption is a syllable-based rule, that the continuant that follows CVn is ambisyllabified, at the time when Nasal Absorption applies, by a rule like the following:



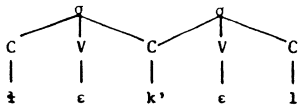
The feeding relationship of ambisyllabification and nasalization is illustrated by the following derivation:



It may sound somewhat arbitrary at this point, if the rule of ambisyllabification is postulated only to motivate Nasal Absorption as a syllable-based rule. There is, however, another good reason to believe that consonants are ambisyllabic in certain environments regardless of nasal absorption. Recall that the core syllable types include CV̆C, which is distinct from CVC, and there is no CV̆ type. In other words, reduced vowels (V̆) do not occur in open syllables. There are no words ending in ɪ, ɛ, or ʊ. Then, how can such words as those below be syllabified?

(9)	a.	ɬɛk'ɛl	'it's white'	(cf. ɬɛsk'ɛl	'I'm white')
	b.	nɛzun	'it's good'	(cf. nɛszun	'I'm good')
	c.	ɣɛbiɬ	'he swam'	(cf. ɣɛsbiɬ	'I swam')
	d.	dɛni	'person'		

These words all appear to have two syllables each of the form CV̆-CVC, but a native apeaker cannot syllabify them in this way. Instead, these words are syllabified as illustrated by the following example in which the second consonant is ambisyllabic.



The ambisyllabic k' in ɬɛk'ɛl is longer (in the pronunciation in which the word is syllabified) than the k' in ɬɛsk'ɛl in which it is not ambisyllabic. Because of the lengthening of the ambisyllabic k', the timing of the two words is identical.

4. The rule of ambisyllabification then can be seen as a means to maintain core syllable types by eliminating CVCC and CV̆. In this sense, Chilcotin ambisyllabification is functionally related to the ə ~ e rule of Chipewyan which has virtually identical syllable types, but quite different vowel systems. It has five full vowels (i, e, a, o, u) and only one reduced vowel, ə. The syllable type Cə is prohibited because ə is replaced by e if syllabification is imposed, but there is no rule of ambisyllabification in Chipewyan.

In short, where a rule of ambisyllabification is independently motivated in Chilcotin, the nasalization rule in Chilcotin is seen not only as a syllable based rule, but also as a rule that changes a noncore syllable type to a core type.

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