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Sandhi in a Salishan Language: Okanagan (Nicola Lake) [1]

by

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This paper will discuss four points: (1) liaison, with special reference to the $\overline{X}$ notation (Chomsky 1970; Jackendoff 1974), supported by Standard French liaison in elevated speech (Selkirk 1976), and to the hypothesis (Kinkade 1977; Kuipers 1968) that there is no noun/verb distinction in Salishan languages; (2) the realization of labialization, i.e., of a single feature as a separate sequential surface element, occurring in liaison contexts and elsewhere; (3) the manifestation, in a sandhi context, of a sound (X) which happens to be precisely what is missing in the affricate series of the phonemic component inventory of this language; and (4) sandhi and syllabification.

Okanagan[2] is an Interior Salish language, mostly spoken throughout the Okanagan Valley in British Columbia and Washington State. This particular dialect is spoken in an adjoining northwestern valley by the Upper Nicola Band, residing on Quilchena and Douglas Lake Reserves, located northeast of Merritt, B.C., in Nicola Valley.

1. Liaison, $\overline{X}$ notation, and nouns and verbs

In 1970, Chomsky proposed for English that the classes N, A, and V constitute a natural category, demonstrating that each may be strictly subcategorized for the same variety of complements: S, PP, AP, NP, VP, etc. He suggests (a) that the lexical categories N, A, V be represented by a variable X in phrase structure rules, for the rules:

$$NP \rightarrow N\ Comp$$
$$VP \rightarrow V\ Comp$$
$$AP \rightarrow A\ Comp$$

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2   The main language consultant is Joseph Albert Michel, affectionately known as 'Uncle.' He is a fluent elder, 69 years of age, recognized by his family and band members for his knowledge of the languages, having been selected by his Okanagan mother as the offspring to remain at home and thus guard from schooling. Uncle has a passive knowledge of Thompson, the other Indian language spoken in Nicola Valley, and knows a few words of Shuswap, both Interior Salish languages. His fluent English shows a few traces of Okanagan, mostly few voiced stops and a tendency to break down CCs with epenthetic vowels. He has taught himself to read and write English. Data which he has provided and which was not elicited thru translation are indicated as (JAM).

where

$$Comp \rightarrow \{S, PP, AP, NP, VP, etc.\}\ ;$$

(b) that, abbreviating the four rules above, each of these categories X is dominated in turn by a category $\overline{X}$ which includes the possible set of complements of X:

$$\overline{X} \rightarrow X\ Comp$$

and further, (c) that elements referred to as specifiers are sisters to the $\overline{X}$, dominated by double-bar phrases, designated as $\overline{\overline{X}}$

$$\overline{\overline{X}} \rightarrow \left[Spec,\ \overline{X}\right]\ \overline{X}\ .$$

The specifiers of an NP are elements such as determiners, quantifiers; of an AP, elements such as comparatives and other qualifying or quantifying expressions; of a VP, elements such as auxiliaries and certain adverbials. Chomsky and Jackendoff differ in that the former prefers one lexical entry for pairs such as refuse, refusal, undifferentiated for noun or verb, while the latter prefers two lexical entries, related by a lexical redundancy rule.

This $\overline{X}$ notation is of particular interest for the analysis of Salishan and other NW coast languages. Although the literature on the topic is meager, many linguists working on these NW languages feel that there is no noun/verb distinction and that N and V (and probably adjectives, too) are derived from the same root. Kinkade (1977) and Kuipers (1968) claim that there is no distinction, according to their analyses of Salishan, wherein the

so-called 'noun' and 'verb' are capable of taking the same inflections,
of taking the same kinds of complements and are from the same roots.
Newman (1977), in a footnote, states that for Salishan languages, a
distinction must be made between lexical category and syntactic
category, wherein 'noun' and 'verb' are syntactic categories.
What is common to these proposed analyses of Salishan languages and
the development of $\overline{X}$ notation is that both discuss the logical
structure of phrases. Chomsky proposed to codify the similarities
of phrase structure by abbreviating with $\overline{X}$ in the PS rules and by
showing the relationship in the lexicon with a single lexical entry,
for lexical pairs, unmarked for the syntactic feature differentiating
nouns from verbs. Thus this predicts that the use of this notation
would simplify rule statement for phenomena affecting both syntactic
categories of noun and verb. For Salishan, then, in a transformational
framework, within this lexicalist hypothesis, roots could be entered
into the lexicon without being differentiated as N, A, or V.

Questioning the existence of natural classes proposed by
theory but which do not appear in rules, Selkirk (1976) demonstrates
that liaison in formal Standard French does support the grouping of
N, A, and V in a natural class and that the rule for liaison is most
simply stated in terms of the $\overline{X}$ notation.

In French, a final obstruent is deleted before an initial
consonant in the following word. If the following word is vowel

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initial, liaison may occur. In elevated speech, the rule is extended:
a head N, V or A which is inflected may be in a liaison
context with the word that follows, if that word is in its
complement...In terms of the $\overline{X}$ notation, one can simply say
that a liaison context exists between an inflected X and its
complement, both dominated, of course, by $\overline{X}$. (Selkirk, 1976, p.21)

Complements to N, dominated by $\overline{N}$, are in liaison contexts:

(1) des endroits obscurs   "dark places"   (Selkirk, (14))

(2) de vieux soldats à moustaches grises

   "old soldiers with grey mustaches"   (Selkirk, (14))

but elements outside an NP are not in a liaison context with an
inflected N:

(3) Donnez ces lunettes / à Marcel.   (S18)

   "Give these glasses to Marcel."

(4) J'ai trouvé mes lunettes / à la mairie.   (S20)

   "I found my glasses at the townhall."

(5) Les animaux / accouraient.   (21)

   "The animals came running up."

And it is similar for plural adjectives which are in liaison with
their vowel-initial following complements, in elevated speech.

Within a verb phrase, liaison exists with direct and
indirect objects in immediate proximity of the V:

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(6) Elle donnait un cours / à l'université.   (S27)

   "She was giving a course at the university."

(7) On demandait à Marie de le faire.   (S27)

   "Mary was asked to do it."

with prepositional phrases:

(8) Vous resemblez à votre soeur.   (S29)

   "You resemble your sister."

(9) Vous conduisez avec soin votre bateau.   (S31)

   "You drive with care your boat."

with certain adverbs (i.e., non-sentential adverbs):

(10) Ils répondront immédiatement / à vos question.   (S30)

   "They'll answer your questions immediately."

(11) On voyait encore les toits de la ville.   (S32)

   "The roofs of the city could still be seen."

but not with sentential adverbs:

(12) Nous partons, heureusement.   (S33)

   "We're leaving, fortunately."

and not with intrusive adverbials characterized by radical
intonation breaks:

(13) D'habitude ils mangent / après avoir fini leur partie

   d'échecs / une petite choucroute.   (S34)

   "Usually they eat / after having finished their chess

   game / a little sauerkraut."

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Thus, Selkirk shows that, for one style of one French dialect,
the simplest and most general formulation of the liaison rule is
best expressed in terms of $\overline{X}$ notation (cf. her (13) X-Comp rule,
p. 582) and

> thus we see that phonology has provided evidence for
> a very abstract hypothesis about syntactic structure.

>   (Selkirk, 1976, p. 589)

Let us now turn to Okanagan data to see where liaison
contexts occur. Basically, liaison occurs across a word
boundary, between a vowel-initial segment and a consonant-final
one, with the vowel attaching itself to the preceding consonant.
By comparison, for French the final obstruent attaches itself to
the initial vowel in the appropriate liaison context. The determiner
/i/, definite, also the all-purpose preposition, is especially
fruitful for providing liaison contexts.[3]

The following examples support the $\overline{X}$ notation:

within a NP:

(14) /i   ttwiʔt___i   sp'ic'n - s /

   def.   boy   def.   rope   - his

   "the boy's rope"

   [yi   tataʔwiti sp'ic'ns]

_____

3   Symbols used: V̥ devoiced; C̚ unreleased; C̬V̥ partially
devoiced; V epenthetic; R̥ syllabic; V retracted, after pharyngeals
and uvular stops; C' glottalized; Cʷ labialized; / / phonemic
or near-phonemic; [ ] phonetic; - morpheme boundary; # word boundary;
$ syllable boundary; ´ primary stress; ` secondary stress.
The consonant inventory is given on page 15 .

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(15) /y̓ʕayʕát___i   sq'ʷq'ʷim̓elt   c̓'k'ʷʕʷǽk'ʷʕʷa / [4]

every   def.   baby   cries

"Every baby cries."

[y̓ʕayʕísti   sqˣ'pqˣ'wimɛlt   c̓'k'ʷʕʷǽk'ʷʕʷa]

within a VP:

(16) /łxʷpə́sn - t - p ___ i ___ kkłǽp/

rope -trans-2pl def. dog

"You-2-3 rope the dog."

[łxʷpə́səntʰəpʰi   kəkə̓ʔwǽp]

(17) /łxʷpə́s - t - n ___ i ___ kkłǽp/

rope -trans -1s def. dog

"I rope the dog."

[łxʷpə́sənə   kəkə̓ʔwǽp]

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[4]   The pharyngeals (ʕ, ʕʷ, ʕ', ʕ'ʷ) predictably occur
with an adjacent low, central vowel and it is almost impossible to
decide on their sequencing; for example, 'every' can be perceived
as y̓ʕayʕísti   or   y̓ʕayʕíʔ·], while 'day' appears as either
sx̌ʷlx̌ʔlt   or   sx̌lxʔlt . Those few word-initial
pharyngeals which are followed by a diphthong are phonemicized as
VC sequences, as in 'tooth' /ʕitmn/ [ʕaytmʔn] , 'man' /ʕimt/
[ʕaymt] , 'tired (from sitting)' /ʕit/ [ʕayt] , 'tired (from
walking)' /ʕix̌ʷt/ [ʕayx̌ʷat] . No sequence with a high, back
vowel has yet been collected; 'day' /x̌ʷ'ʷaʕ'ʷat/ [xʷaʔwat] ;
'break one cry' /nəłłíxaʔ nsʕ'ʷaʕ'ʷa/ [nsʕ'ʷaq'ʷwi] .
Mattina (1976) has already noted for Okanagan (Colville) and
other Interior Salish languages, that pharyngeals migrate to the
nearest stressed V and affect these Vs by lowering them. One
pharyngeal in my data did not migrate. In one realization, it
was absent; in the other, a most peculiar pharyngealized syllabic
m resulted: 'defecate' /mʕ'nik'm/ [mə̣nik'ʌm] or [mʕʔmnik'ʌm] .
However, compare 'bathroom' /snmʕ'nik'mn/ [snmanʕ' áyk'mn] .

(18) / i kowpóy   killúł - t - s ___ i   slá?xt - s ___ i   sp'íc'n - s /

def. cowboy   coiled for-3s   def. friend-3s def. rope-3s

[yí kɔwpʰóy   killúłci   slá?xci   sp'íc'ns]

The cowboy coiled his friend's rope.

As in French, liaison does not occur across a major intonation break:

(20) q'íq'ʌm'   mi   wi?sti - s ___ i   si?č ___ i   čitxʷ - s // Ivan

almost   fut.   finished-3s def. new   def. house-3s , Ivan

Ivan pretty near finished his new house.

In French, the formularization of liaison can be stated
as a readjustment of word boundaries. Erasing a final word boundary
of an inflected lexical category dominated by X̄, Selkirk's X-Comp
rule leaves only one word boundary between two major lexical
categories, thus predicting liaison contexts correctly for

(6) Elle [[donnait]$_X$ [un cours]]$_{\bar{X}}$ [à l'université]$_{pp}$ (S27)

"She gave a course at the university."

(21) [Rompez]$_X$ [avec ces gens-là]$_{pp}$!   (S29)

"Break off with those people-there!"

(22) Elle [[partageait]$_X$ [ses bonbons]]$_{\bar{X}}$ / [avec ses copines.]$_{pp}$ (S18)

"She shared her candies with her friends."

Liaison in Okanagan cannot be accounted for in terms
of $\bar{X}$-notation, or for that matter, in terms of phrase structure
because liaison occurs between major lexical categories and between

phrasal structures, as in

(23) /xʷƚc'ʼ - ⅄ - t - n | ttƚft i   sp'ƚc'n - s i   k'l - ⅄' x⅄xáp /

give-redirective-tr-1s def. boy def. rope-3s def. directional-old man

"I gave the boy's rope to the old man."

[xwƚc'ʼ⅄tnə   təta?wƚti   sp'ƚc'nsi   k'l⅄'x⅄xáp]

(24) /⅄xʷpós - slx i   kkƚáp i   t   sp'ƚc'n/

rope - 3pl   def. dog def/prep indef. rope

"They roped the dog with a rope."

or [⅄xʷcpóspsilxi   kəka?w⅄pi   tʰʼspʼƚcʼn]
       ⁔ˢ ⁱ ˣ ⁱ

Nor does liaison serve to disambiguate constituent

structure in Okanagan as it does in French (elevated speech):

(25) a. un marchant de draps anglais   S15a)

         "a merchant of English sheets"

     b. un marchant de draps / anglais   (S15b)

         "an English merchant of sheets"

         "a merchant of English sheets"

Compare (25) with (26):

(26) / xʷƚc'ʼ - ⅄ - t - n i   ⅄'x⅄xáp i   sp'ƚc'n - s i   ttƚft/

give-redir.-trans-1s def. old man   def. rope - 3s def. boy

a. "I gave the old man's rope to the boy."

b. "I gave to the old man the rope of the boy."

[xwƚc'ʼ⅄tnə   ⅄'x⅄xápi   sp'ƚc'nsi   təta?wƚt]

In all of the examples given above, a non-lexical item[5]
of a major category is linked to a preceding consonant-final lexical
item of the same major category as in (14), (15), or of different
major lexical categories, as in (23), (24), and (26).

Although referring to grammatical information is
permissible in phonological analysis, the $\overline{X}$ - notation, which
unites the phrase structure of nouns and verbs, is of no benefit
to the statement of liaison in Okanagan. Moreover it should be
noted that it is of limited benefit to the analysis of French liaison
since the extensive liaison presented by Selkirk (1976) occurs in
one very formal style of one dialect.

Therefore liaison in Okanagan does not provide support
for or against the $\overline{X}$ - notation. Nor does it provide support for
or against the proposed analysis of Salishan languages as being
without a noun/verb distinction. It is precisely because of this
proposed analysis that one would expect an abstract hypothesis
about syntactic structure, such as the $\overline{X}$ - notation, to be of use
in the phonological analysis of liaison in these languages.

Before discussing the probable function of liaison
in Okanagan, two other related matters will be discussed.

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5   Non-lexical items which are considered to be articles,
complementizers, prepositions, modals, etc., are not flanked by word
boundaries, according to SPE convention 366, while 'noun,' 'verb,'
'adjective,' 'sentence,' 'noun phrase,' 'verb phrase,' being
lexical items, are.

2. Liaison with labialized consonants

In the examples given in section 1, none of the consonants in a liaison context were labialized. However these do occur, and their phonetic realization is most interesting because one feature of the bundle C^w is manifested as an additional sound segment, in temporal sequence. In Okanagan, a labialized consonant immediately followed by another consonant or by a word boundary is realized as a $C^w + V$ sequence, and this vowel is usually voiceless when word-final. When followed by a vowel, the labialization is realized as a separate consonant, a w-glide, i.e., as $C + w$.[6] The latter occurs in liaison contexts.

The following examples illustrate the phenomenon, first, the realization of C^w before another C or a # :

(27) /qʼʷqʼʷýóma? i čítxʷ /

     small   def. house

   [qʼʷọqʼʷọ?yóma?i   čítxʷọ]

_____

[6]   This does not occur with labialized pharyngeals, which are distinguished from the other labialized consonants by the feature [+ low] . See sentence (39) of section 3 for an example.

    MDK has pointed out to me that one should expect to find contrasts of /kʷV/, /kwV/, and /kʷwV/. See (32) and (34) for examples of /kwV/, and (46) for an example of /kʷwV/.

(28) /stxʷxʷó? - kst - xn/

      -lower leg-foot

"shinbone"

  [stxʷọxʷî?kstxἰn]

(29) k - čʼ - xʷxʷná - nún - n t   lti Sharon

           -accidental-

    distributive-   -less than -1s indef. tea Sharon

      -cislocative-   full control- tr.

             spill

"I spilled some tea on Sharon."

  [kčʼxʷọxʷọnánòn   taltí] Sharon

(30) /kʷ   čʼ - kʷí - n - kʷi - ní - m t spʼíčʼn/

    2s   cisloc.- -mobile-   -mobile-

      intr.   - take   - redup. -medio indef. rope

"You holding a rope (while walking)."   (for a long time)

  [kʷχ̌ʼkwἐnkwəním   tʰἰspʼíčʼn]

second, the realization of C^w before a vowel, including within a liaison context:

(31) /čʼ - kʷí - s - kʷi - s - t - xʷ i spʼíčʼn/

    cisloc.- -stationary- -stat.-

          - take   - redup. -trans-2s def. rope

"You're holding the rope (while standing or sitting)."

(for a short time)

  [čʼkwískwìstxwi spʼíčʼn]

(32) / č' - kʷíl - ⅄ - t - xʷ‿i kkʷáp‿i siúps - s/

    cisloc.-take-redirective-trans-2s def. dog def. tail-3s

"You pull the dog's tail."

[č'kʷíl⅄txwi kⅎkⅎ?wⅎpi šiúpsč]

(33) / k - č' - xʷiná? - slx i sčá'q'ʷ t ltí /

    distributive- water - 3pl def. flowers indef./ tea
    -cisloc.-   ~~prep~~

"They water the flowers with tea."

[kč'xwiná?sⅎlxi sčáⅎ'q'wⅎ tⅎltí]

In this example, the labialization of q'ʷ in 'flowers' is realized as a low vowel, partially voiced. The height of this vowel is affected by the preceding consonant, and doubly so in this example, since both preceding consonants are [+back, -grave].

As part of this phenomenon, the manifestation of labialization, a reduplicated labiovelar w is realized as the vowel o between consonants:

(34) a. /x - w - wiyu /   "tall cup or can"

      -redup-

      [xcwiyu]

  b. /k - k - w - kⅎp /   "a bunch of dogs"

      -diminutive- pl. redup.
      redup. └─────────┘
                 horse

      [kⅎko:?wⅎp]

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which contrasts with

(35) / kn xʷíum /

    1s   whistle-medio
      intr.
  "I whistle."

  [kⅎn xwíyum]

To my knowledge, there is no provision in SPE for dealing with sequencing of this type, where one feature of a bundle is realized as a separate sound segment.

3. Sandhi and the phonemic inventory

There occurred in the data collected to date a few instances of a sound which is not represented in the phonemic inventory of this language. This is not unusual, but what is of interest is that the resulting sound, a non-glottalized lateral affricate ƛ, is what would be needed to fill one of the two gaps in the phonemic inventory:

Okanagan (Colville):

p'	t'	c'	ƛ̓	k'	k'ʷ	q'	q'ʷ	ʔ
p	t	c	◯	k	kʷ	q	qʷ	
◯	s	⅄	x	xʷ	x̣	x̣ʷ	h	
m'	n'	r'	l'	y'	w'	ʕ'	ʕ'ʷ	
m	n	r	l	y	w	ʕ	ʕʷ	

(Mattina, 1973)

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(36)   /seeát   lx/

      fall   3pl
      (collective   intr.
      action)

      "They fall (altogether, at once)."

      [sesé:x̌x]

(37)   /in - stmtíma?   siú?s - t   lti/

      my-grandmother   drink-trans.   tea

      "My grandmother drinks tea."

      or [yistimtíma?   siú?sx̌tʃ]
         [yistm̩tíma?   ]

which contrasts with:

(38)   /in - stmtíma?   siú?s - t   t   ltʃ /

                     indef.

      "My grandmother drinks some tea."

      or [yistamtíma?   siú?st   taltʃ]
         [yistm̩tíma?   ]

This change occurs only across word or morpheme boundaries, not
within segments:

(39)   /kn   yélt   tl   sł·ʕʷáʕʷa /

      1s   run   directional   drunks
          intr.   away from

      "I run away from drunks."

      [knyélt   tl   sł·ʕʷáʕʷəx]   (JAM)

Does the appearance of x̌ mean some sort of change in the
phonemic inventory? Was it at one time a phoneme? or is it becoming
one? Comparative evidence does not support any speculations of a
former phonemic status, since x̌ is not reconstructed for Proto-Salish
(Kinkade, 1978).   It seems odd that no Salishan language has a / x̌ /
phoneme, except for a couple which have clearly borrowed it from
Kwakiutl.   Because of a general lack of written historical
documents, one cannot expect to find evidence to indicate any previous
existence or length of existence of this morphophonemic change. At
the synchronic level, Mattina (1973) does not discuss the
appearance of a x̌ for Colville, another dialect of Okanagan; nor
do Thompson and Thompson (1977) discuss it for the other language
of Nicola Valley, Thompson.

    Questioning the psychological reality of underlying
forms is not appropriate. Do speakers merge levels of inventories?
or permit overlays? or fill in 'des cases vides?' These questions
cannot be answered; nevertheless, the appearance of x̌ , as a
result of sandhi, remains interesting because such an element
is indeed missing at the phonemic level.

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B. Carlson: cf Vogt
+ in reduplication

T: Straits
Squamish

4. Sandhi and syllabification.

In section 1, a hypothesis (Kinkade 1977, and Kuipers 1968) was referred to, which claims that there is no noun/verb distinction in Salishan languages because these take the same affixation, the same kinds of complements and the same morphological derivation. Moreover, Kinkade (1977) claims that arguments of predicates are predicates themselves. X̄ - notation (Chomsky 1970, and Jackendoff 1974) was also referred to in section 1, since they propose with considerable detail that N, A, and V can all be generated by the same phrase structure rules, using a general X instead of each of N, A, V, because these all take the same kinds of complements. The similarity of these hypotheses lies in uniting major lexical categories. Selkirk (1975) provides evidence from the phonological level of an elevated form of French that the statement for liaison is simplified thru the use of X̄ notation. It is plausible then to look for similar phonological evidence in a Salishan language, to support abstract hypotheses about grammatical structure. However, Okanagan, which does have liaison, does not provide any, as has already been seen. What then is the function of sandhi in Okanagan?

The outstanding characteristic of Salishan languages is the remarkably large inventory of consonants, coupled with the relatively few vowels, producing forms such as:

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mDK! Categories do not exist

(40) a. kn   n - lúx^w - x^w - xł - nk

1s contained-roar - redup- inside- stomach
intr. (loc.)

"My stomach's roaring."

b. st'xít - k^w

-liquid

"broth"

How then are such forms realized? How can these be articulated? Sandhi: liaison, labial realization and epenthesis provide a complex puzzle, with syllable structure the key. Elsewhere have been discussed stress which may shift from root to strong suffix (Mattina 1973; also Kinkade for Columbien, 1978), and pharyngeals which migrate to stressed vowels (Mattina 1976) in Interior Salishan languages. Mattina (1973) also gives the conditioning environments of the variable epenthetic vowels for Okanagan (Colville). Similar processes occur in Okanagan (Nicola Lake), although the details are not specified herein. Stress is treated as already assigned.

Let us now examine some evidence of sandhi contributing to the articulatory realization of Okanagan:

(41) a. / łx^{w}pósn - t - p   i   kkẃáp/

rope - trans - 2pl   def. dog

"You-2-3 rope the dog."

b. dictation speed: łxwopósənt^{h}əp^{h}ə yi   kəkə?wʌ́p

c. normal speed: [łxwgpósənt^{h}əpi   kəkə?wʌ́p]

d. with syllable boundaries indicated:

[łxwg\$pó\$sən\$t^{h}ə\$pi   kə\$kə\$?wʌ́p]

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(42) /č' - kʷíš - kʷíš - t - p‿i   sp'íč'n/

   cisloc.- take- redup. - trans.-2pl def. rope
        - hold   -

   "You-2-3- hold a rope."

   normal speed, with syllable boundaries indicated:

   [č'kwíš$kwĩš$tʰə$pi   sp'íč'$n]

        Let us now compare some utterances to determine
   preferred syllable structure and the possible order of rules:

(43) a. /č' - kʷí - ní - xi - t‿i   sp'íč'n/

   cisloc.-take-mobile-benefactive-trans.
           - bring   -   def. rope

   "Bring the rope!"

   dictation speed: č'kwínixit yi sp'íč'n

   normal speed: [č'kwínixte   sp'íč'$n]

   b. /č'kʷínixit   t   sp'íč'n/

                      indef.

   "Bring { some / any } rope!"

   normal speed: [č'kwínixtɨs$p'íč'$n]

(44) / kʷo   č' - kʷíl - ɨ - kʷil-ɨ - t‿i in-sp'íč'n/

   1s cisloc- take-redirective-redup -trans. indef. my-rope

   "Hold my rope for me."

   [kwoč'$kwílɨ$kwĩlɨ$ti(ɨ)s$p'íč'$n]

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        The above example (44) as well as (45) and (46) below
   show that a word-initial C' is subject to entering the preceding
   syllable:

(45) a. /kʷ   tq'ʷáq'ʷa /

   "You fall down"

   [kw$tə$q'wášq'wa]

   b. /kʷ   č'kʷɣʷškʷɣʷa /

   "You cry."

   [kw$č'$kwɣʷá$škwɣʷ]

(46) /lút kʷo an - ks - ʔóm - m   t   kíkʷwa? ;

   neg. 1s 2s,poss-unrealized-call-medio indef. Grandpa;
              /sub.

   kʷo   ʔóm - n   səsí?/

   1s   call-   Uncle

   "Don't call me Grandpa; call me Uncle."   (JAM)

   [lút kwaks$ʔóšm   tʰɨ$kíkwowʌ? ; kwo ʔóšmən sə$sí?]

        The following two examples illustrate that a syllable
   cannot be vowel-initial, i.e., its initial segment must carry a
   feature [+consonantal] , thus accounting for syllabic resonants:

(47) / i in-stm-tíma? kʷo k - sp'íč'a - s‿i t sp'íč'n -s/

   def. my-grandmother 1s distributive- -3s def./ indef. rope-3s
                          - whip   -   prep

   "My grandmother whipped me with her rope."

   [yis$təm$tí$me? kwo$kɨs$p'íč'a$si   tʰɨs$p'íč'$ns] (JAM)
   or [yis$tm $tí$ma?]

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MDK syllabic resonants al peaks
        not margins

(30) /k^w ž' – k^{w}ʃ – n – k^{w}i – nʃ – m   t sp'ʃč'n /

    2s cisloc.-take-mobile- redup ̲̲ -medio indef. rope
               hold

"You holding a rope (while walking)." (for a long time)

[kwž'$kwžn$kwə$ním   tʃs$p'ʃč'$n]

These additional examples raise the question of how the analyst is
to proceed to formulate the organization of syllable structure:

(45) /ž' – kwʃ – s – k^{w}is – t – lx   i   sp'ʃč'n/

    cisloc.-take-stationary-redup-tr.-3pl   def. rope
               hold

"They hold a rope (while standing or sitting)." (for a short time)

[ž'kwʃs$kwīs$čil$xi   sp'ʃč'$n]

(49) /k'ł ž' – x^w – x^w – mʃ – n   i ltʃ ltáp/

    directional   -accidental-
        cisloc.- spill   -1s def. tea table

"I spill some tea on the table."

[k'łž'xoxo$mʃ$nəl$tʃ   l$táp]

(14) /y'əy'át   i   sq^{w}q'^{w}ʃmelt   ž'k^{w}ʕ^{w}ák^{w}ʕ^{w}ə/

    every   def. baby   cry

"Every baby cries."

[y'əɜy'ʃ:tisq^{x}o?$q^x?wéy$?melt$^h   ž'kwʕ^{w}á$kwʕ^{w}ə]

---

(50) /ƛx^{w}pósn – t   i   kkwáp/

    rope   -trans. def. dog

"She roped the dog."

[ƛxwo$pó$sən$ti   kə$kə$?w$_{Λ}$p]

The above examples show that the formula $(\#C'^1_0)C^2_0$ (w)SC^2_0 ,
where S is a [+syllabic] segment, including a syllabic resonant, vowel,
or diphthong, summarizes what occurs in this data.

       A possible way to effect these structures is as follows:
1. assume the following: i) stress – given, already assigned (cf. 30, 49):

                 ii) migration of pharyngeals – not illustrated

in the data of this section;
2. then apply processes in an order such as this (while presumably
readjusting Cs, left or right, after each has applied):

    i) liaison occurs (cf. 41 c,b; 42; 44);

    ii) realization of labialized Cs (cf.45);

    iii) merger of identical Cs or Vs across word boundaries (cf.43b,47);

    iv) epenthesis (cf. 43b);

    v) flaking off the word-initial C' to preceding segment, if any,
(all clitics, in this data) (cf. 45a,b);

    vi) syllabicity of nasals. (cf. 46).

However, this does not guarantee the correct output, since it does
not specify a procedure. One could, with epenthesis for example, still
not know where to begin if a word needed more than one epenthetic vowel.

Therefore, some principles of syllable structure are needed.

Pulgram (1970, in Hyman 1975) proposed three principles:
I Maximal Open Syllabicity; II Minimal Coda and Maximal Onset; and
III Irregular coda. Applying these from word initial to final,
Pulgram assigns 1) a syllable boundary after every vowel (the
principle of maximal open syllabicity); 2) then readjusts as many
consonants as needed to provide permissible closed syllables (the
principle of minimal coda and maximal onset) because, in English,
lax vowels are disallowed in final position and must be in closed
syllables; and 3) readjusts again to yield syllable onsets which
are permissible word-initial sequences (the principle of the irregular
coda). Similar principles, applied in reverse direction, from
word final to initial, seem to determine syllable structure in
Okanagan, quite possibly operating to avoid consonant clusters,
building the application of the processes of liaison, epenthesis,
labil realization and resonant syllabicity, i.e., sandhi.
Details of their application differ somewhat: 1) the principle of
maximal open syllables is basic, with an open syllable, CV, clearly
the preferred structure; 2) the principle of minimal coda and
maximal onset restricts, at least in these data, a) the permissible
codas to one or two consonants (see, for example, (14) and (44)
for Resonant + C codas, $-l\check{y}$ and lt^h), and b) also restricts longer
consonant sequences to onset rather than coda; 3) while the
principle of the irregular coda breaks down an inadmissible syllable-

initial CC so that the previous coda rather than the onset bears
the burden of irregularity (see (46) where the ks sequence, as the
unrealized morpheme, is a coda but not so in (47) where this same
sequence is not a morpheme, and receives epenthesis, thus distinguishing
the two sequences.)

An alternate procedure to guide sandhi in this language
may be by ordering the preferred syllable structures, but this ordering
itself implies a set of criteria or guiding principles. Therefore,
this ordering of syllable structures, up to the formula already
given $(\#C \cdot \frac{1}{0}) C_0^2 (w) \underset{[+syllabic]}{S} C_0^2$, is dispensed with in favor of
guiding principles, such as Pulgram's, which state more simply that
consonant clusters are to be broken down, that open syllables are
preferred to closed ones, and that CCs are preferred for onsets rather
than for codas.

In this solution, a further set of assumptions has been
made: a) that syllable structure is not an abstract distinctive
unit but a unit required for the production of utterances (cf. Fromkin
1968, in Hyman 1975); b) that the syllable is a phonetic unit, i.e.,
surface or very near surface phenomena; c) that the 'pause groups'
observed in the production of the language consultant are largely
indicative of syllable boundaries, along with 'syllabic weight',
and that glottalized Cs, for example in initial position, may provide
articulatory pauses, without forming a separate syllable; and d) that
the syllable is a necessary concept, guiding certain rules of sandhi,

thus alleviating the analyst of the burden of ordering or not such rules.

The application of these principles of syllable structure

is now illustrated:

(51) (from (47))   kʷo   k - sp'fč'a - s   i...

liaison,I $si

    I $č'a$si

    I $p'fč'a$si

epenthesis,II $kɨs$p'fč'a$si

    I   kwo$kɨs$p'fč'a$si

It can be seen that the first principle, maximal open syllabicity,

has priority over the others. Morpheme boundaries probably also

enter into the determination of syllables, for example, the prefix

ks- , unrealized, (cf. (46)) has not yet occurred with an epenthetic

vowel, which contrasts with the $kɨs$ observed in (51 ≡ 47).

In the next example, ...tisp'f... is possible as

well as what occurs ...$ti(:)s$p'f... This shows that, although

open syllables are preferred, a syllable may be closed to avoid

CC onsets. Compare also (30) and (48).

(52) (from (44))   kʷo   č'kʷflɨkʷilɨt   i   in-sp'fč'n

Liaison, I $ti

    II, III $kwflɨ$ti

    II, III $kwflɨ$kwflɨ$ti

    II   kwoč'$kwflɨ$kwflɨ$ti

Syllabic,I $n̩

    II $p'fč'ᵛ$n̩

Merger, II   kwoč'$kwflɨ$kwflɨ$ti(:)s$p'fč'$n̩

(53)   (from (41b))   st'xftkʷ

Labial realization,I $ko̥

Epenthesis,I $tə$ko̥

    I xftə$ko̥

Epenthesis,I   st'ə̰xftə$ko̥

(54)   (from (41))   lxʷpósntp___i   kkɨɨp

Liaison,I $pi

Epenthesis, I $tʰə$pi

Epenthesis, II $sə̰n$tʰə$pi

    I $pó$sə̰n$tʰə$pi

Labial realization,I lxwo$pó$sə̰n$tʰə$pi

II $?wɨp

Epenthesis,I $kə$?wɨp

Epenthesis,I $kə$kə$?wɨp

It is suspected that the principles and processes

illustrated above apply first to the main predicate, then to the

arguments (or adjuncts, according to one's preference.) This

cannot be supported at this time, due to having collected an

insufficient number of utternaces of appropriate length and

complexity, with sandhi, et al, recorded. Example (52) indicates

that this is probably the case, in order to get the correct output

of liaison and optional length. Example (43b), like (52), shows the

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merger of identical segments across word and phrase boundaries.
If one proceeds from back to front for each surface level 'word,'
then this merger happens to occur last, to link 'words' together.
One could just as well postulate that syllable structure is
determined from the very end of the utterance to the front. This
is not as appealing, since speakers make a pause between the
merged segments, when slowing down their speech.

Thus, in Okanagan, a Salishan language, where one would
hope to find phonological support for a hypothesis claiming that
there is no noun/verb distinction, there is none; a language, where
one would expect to find phonological support from liaison for a
theoretical proposal that the phrase structures of N, A, V are the
same, there is none. No evidence for them, but also importantly,
no evidence against them. Instead, sandhi phenomena has been
analyzed as functioning within the articulatory realization of
characteristically complex consonant clusters, guided by
principles of syllable structure.

Addendum

Since writing this paper, I have seen Hoard's (1977)
manuscript on syllabification in NW languages and Snyder's (1968)
description of So. Puget Sound Salish. To deal with syllabic stops
and affricates, Hoard suggests that these are complex segments where
each may be represented as two or more columns of distinctive features.
This would establish mechanisms to use for writing rules for an
analysis such as mine, using distinctive features, within a
generative phonology framework, if so desired. Proceeding from
different assumptions than mine, Hoard claims that syllabicity has
phonemic status, ex., /stp/, which is to claim that syllable
structure is phonemic. This conflicts with my present analysis and
understanding of Okanagan (NL), ex., sp'łč'n "rope" may be
syllabified as sp'łč'$n or s$p'łč'$n , depending on the preceding
environment (cf. (14), (18), (23-24), (26), (30), (42-46), (52)).
However, regardless of different assumptions, phonemic or phonetic,
the conclusions are similar: that syllable structure, masked by
phonemic transcriptions, renders consonant clusters pronounceable.

Snyder states that aspiration alternates with epenthetic
vowels to form syllable peaks. This does not seem to be the case in
Okanagan, where non-glottalized Cs are predictably aspirated,
although in my case, forgetfully not always recorded. (See Mattina,
1973, p. 8)

t' t'óm̓ t'ɔm̓ ɛ yt

í x̣' x̣̓x̣ x̣' x̣áp

smile for the
elders

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      kn qʷɛl'st   I'm warming myself
      qʷɛl'n-n   I warm it

kʷo , -wix

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