On the Distribution and Representation of Schwa in Sliammon (Salish): Descriptive and Theoretical Perspectives

by

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B.A. Linguistics, University of British Columbia, 1987

M.A. Linguistics, University of British Columbia, 1992

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF

THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

in

THE FACULTY OF GRADUATE STUDIES

(Department of Linguistics)

We accept this thesis in conforming

to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

December 20, 2000

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Vancouver, Canada

Date Dec 22, 2000.

DE-6 (2/88)

ABSTRACT

The goals of this dissertation are two-fold. My first major goal is descriptive, to contribute to the documentation of the Central Coast Salish language spoken by the Sliammon, Klahoose and Homalco peoples. The primary source of data is my field notes collected from 1988 through 2000 in consultation with Elders resident in Sliammon, B.C.

My second major goal is theoretical, to deepen our understanding of the distribution and representation of schwa in Sliammon. Schwa, often characterized as a brief "neutral" vowel with special properties cross-linguistically, is central to an understanding of Sliammon phonology and morphology.

In Chapter 2, it is hypothesized that schwa is featureless, and that it acquires its surface realization via colouration from adjacent consonants and vowels.

The focus of Chapter 3 is on the prosodic structure of the language, and the independent hypothesis that schwa is also weightless. These generalizations are presented within the Nuclear Moraic Model of Shaw (1993, 1996).

Chapter 4 focuses on schwa-zero alternations. Schwa is proposed to be non-lexical, and schwa epenthesis satisfies the constraint Proper Headedness which requires that a Foot contains a syllable which is headed by a vocalic Nucleus. Schwa epenthesis also satisfies the ban on stem-initial consonant clusters. This chapter also provides evidence that Full Vowel Reduction involves the loss of phonological weight (i.e. a mora). The output of Full Vowel Reduction is distinct from schwa in its featural representation, but identical to schwa in its prosodic representation.

Although schwa epenthesis is driven by the constraints on Proper Headedness, there is also evidence that Sliammon has a number of strategies which conspire to avoid schwa in stressed open syllables. Chapter 5 brings together different cases of this, and shows that they receive a unified explanation with reference to the constraint *ə́]σ, and its interaction with other constraints.

Chapter 6 addresses two cases in which schwa epenthesis is systematically avoided: (i) the possessive -hV suffix and (ii) the plural /Lʼ-/ prefix. Chapter 7 provides a synopsis of the descriptive and theoretical claims of the dissertation. Appendices IV-VII contribute to the basic documentation of Sliammon including: Consonant Contrasts, Root List, Lexical Suffixes, and Affixes/Clitics.

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Acknowledgements

First I would like to extend my sincere gratitude to the following Homalco, Klahoose, and Sliammon Elders for sharing their knowledge of the language and culture with me: Mrs. Mary George, Mrs. Agnes McGee, Mrs. Phyllis Dominic, Mrs. Eva Hanson, Mrs. Marion Harry, the late Mr. Joe Mitchell, Mrs. Elsie Paul, Mrs. Sue Pielle, Mrs. Helen Hanson, Mr. Pete Harry, Mrs. Annie Dominick, and Mr. Dave Dominick. I am grateful to the Sliammon Chief and Council, the Sliammon Treaty Society, and community members for the opportunity to study their language. I would also like to express my deepest appreciation to Ms. Betty Wilson who, in collaboration with the Sliammon language working group, provided feedback on an earlier draft of this thesis.

Special thanks to my research supervisor Dr. Patricia A. Shaw, also affectionately known as "Dr. Schwa", who has made this entire process a particularly rewarding intellectual experience. To committee members Dr. Douglas Pulleyblank and Dr. Paul D. Kroeber I also extend my sincere appreciation. Dr. Douglas Pulleyblank will be remembered for asking particularly challenging questions regarding the "theory", and is thanked for sparing me from a lengthy expose on the definition of "stem". Dr. Paul Kroeber, in addition to sharing his wealth of knowledge on Salish languages and Sliammon in particular, also passed on some valuable practical advise. He equates writing a dissertation with making pancakes. This idea is expressed in the following Russian proverb which was handed down to him from his father: pirvey blin komom "the first pancake is always lumpy" .

I would also like to acknowledge questions and feedback from the other members of the examining committee present at my oral defense: Dr. Margery Fee, and Dr. Bryan Gick, (University Examiners), Dr. Anthony Dawson (Chair), and Dr. Sharon Hargus (External Examiner). I also appreciate questions and comments from Dr. Emmon Bach, and Dr. M. Dale Kinkade who first introduced me to the study of Salish languages and linguistics.

I am grateful to my friend and colleague Dr. Honoré Watanabe of Kagawa University for his careful commentary on the most challenging aspects of Sliammon morpho-phonology, and for sending cranes to mark each of the small steps along the way.

I would also like to thank the other faculty and visiting scholars at University of British Columbia who have contributed to my studies: Mrs. Ingrid Brenzinger, Dr. G. Carden, Dr. Henry Davis, Dr. Rose-Marie Déchaine, Dr. Ewa Czaykowska-Higgins, Dr. Hamida Demirdache, Dr.

Laura Downing, Dr. Mark Hewitt, Dr. M. Dale Kinkade, Dr. Juta Kitching, Dr. Greg LaMontagne, Dr. Michael Rochemont. Thanks also to the Faculty and students of Girona Summer School of Linguistics (1996), le ragazze italiane, and to my many fellow graduate students at UBC, especially Darin Howe, Taylor Roberts, and Kimary Shahin. To Carmen de Silva and Edna Dharmaratne my most sincere appreciation for everything you have done.

To my Musqueam friends and colleagues, and students and staff of the Musqueam/UBC First Nations Languages Program - you have all brought something very special to my life : hay ce:p q̓a si:ʔém̓ !

I owe a special thanks to my family Marion, Charles and Margaret Blake for their continued moral support and encouragement. It was my parents who first took me to Savary Island as a child and introduced me to the traditional territory of the Sliammon people. With my sister Margaret, I treasure these early childhood memories of the sand dunes, the water, and the enchanted forest.

To my closest friends, each and every one of you has played a special role: Harry and Patricia Bekke (and the kids: Lynx and Mousette); Luca Burroni, Barry and Maureen Clare and family; famiglia Curini-Galletti: Fabio, Lapo, Lucia and Cosimo; Aldona Dyk, Elena Fiume and Ron Yaworsky, daughters Alessia and Katrina; Jane B. Fuller, Caroline Mitchell, Kathleen and Lauren Stone, Monica Sanchez, Stephanie Trenchiansky, Lance Woolard, and the Sons of Joseph Zawenou.

Thanks also to Sonya Usmiani, Dr. Tracey Simmons MacKinlay, the people of Lund and Savary Island, and especially to Willa Lane.

I am also deeply grateful to Shawn David Clare who has managed "linguistics central" for the past 8 months with a sense of humour and levity which has had a profound effect on our collective sense of well-being. For you, pair-o-dice forever !

My doctoral research has been generously supported by the following funding organizations: University of British Columbia, Graduate Fellowship 1994 -1995; Social Sciences and Humanities Research Council of Canada, Doctoral Fellowship #752-96-1924; M and E. Jacobs Research Fund (1996) for research on 'Sliammon Metrical Structure', and the University of British Columbia Teaching and Learning Enhancement Fund Grant ("Cedar-to-CDRom") awarded to Dr. Patricia A. Shaw.

Abbreviations and Symbols

A. Abbreviations

.	a syllable boundary
1	first person
2	second person
3	third person
Act	activity suffix
Aff	Affix
Aux	auxiliary
C	any consonant
Caus	causative
cgl	constricted glottis
CH	Characteristic Reduplication
CJargon	Chinook Jargon
cl	compound ligature
CL	Compensatory Lengthening
COR	coronal
CTr	control transitive
CVC_{PL}	CVC Plural Reduplication
CV_{PL}	CV Plural Reduplication
$C\text{ə}C_{PL}$	CəC Plural Reduplication
dem	demonstrative
det	determiner
Dim	diminutive
DIM	Diminutive Reduplication
Dimgl	diminutive glottalization
DOR	dorsal

Emph	emphatic
e.o.	each other
Erg	ergative (subject of a transitive predicate)
ex	extension
fem	feminine
Fr.	French
Ft	foot
Fut	future
gen	general
H	high pitch
I.	Indian
Imp	Imperfective
IMP	Imperfective Reduplication
Imper	Imperative
INC	Inchoative Reduplication
Ind	Indirective
Indef	Indefinite
Indep	independent pronominal
Instr	instrumental
Intr	intransitive
K	any obstruent
L	low pitch
LAB	labial
link	linking vowel
LS	Lexical Suffix
lit	literally
M	mid pitch
masc	masculine

neg	negative
Nom	nominalizer
Nuc	nucleus
NTr	noncontrol transitive
O	obstruent
Obj	object
Obl	oblique
OT	Optimality Theory
Pass	passive
past	past tense marker
PHAR	pharyngeal
PL	Plural
PMC	main clause Passive
Po	possessive
PSC	subordinate clause Passive
PrWd	prosodic word
ptc	particle
Q	interrogative, question marker
quot	quotative
R	any resonant
recip	reciprocal
RED	reduplicant
Rflx	reflexive
Rt	Root
Sb	subordinate
sg	singular
s.o.	someone
s.t.	something

stv	stative
Su	subject
Tr	transitivizer
V	any full vowel (here /i, u, a/)

B. Sound Symbols

[ƛ̓]	voiceless ejective lateral affricate
[š]	voiceless alveopalatal affricate
[t^{θ}]	voiceless interdental affricate
[y]	voiced palatal glide (resonant)
[č]	voiceless alveopalatal affricate
[t'^{θ}]	voiceless ejective interdental affricate
[ɬ]	voiceless lateral fricative
[ǰ]	voiced alveopalatal affricate
[ł]	"darkened" lateral resonant (effect of post-velars)
[w̥]	voiceless labio-velar glide (resonant)
C^y	palatalized consonant
C^h	aspirated consonant
ə	schwa
v́	primary stress
v̀	secondary stress
:	vowel length

C. Miscellaneous Abbreviatory Devices

~	alternates with. Used with variant output forms
!	fatal constraint violation
#	word boundary
()	encloses optional element
(...)	marks foot boundary
*	'is not', i.e., in the constraint *Cə́
*	constraint violation
*	ungrammatical
-	morpheme boundary
//	underlying representation
=	introduces a Lexical Suffix
>>	is more highly ranked than
[...]	infix in input representation
[...]	phonetic form / output candidate
☞	marks the winning candidate output form
μ	mora
√	Root
σ	syllable

Pronunciation Guide

Consonants

/p/ voiceless bilabial stop

as in English [pɪnč] *pinch*, [pɪknɪk] *picnic*, [pə́mpkɪn] *pumpkin*.

as in Sliammon [páʔa] *one*, [ʔópʌn] *ten*, [x̌ʷópx̌ʷop] *hummingbird*.

/p̓/ ejective bilabial stop

as in Sliammon [p̓ɛx̌ʷ] *flood*, [p̓ɔ́hɔ] *raven*, [t̓ᶿáp̓aw] *busy*, [x̌ap̓] *cradle basket*.

/tᶿ/ interdental affricate

as in Sliammon [ʔɛ́ɬtən tᶿəm] *I'm going to eat*, [ʔə́tᶿ nàʔ núxʷɪɬ] *my canoe*.

/t̓ᶿ/ ejective interdental affricate

as in Sliammon [t̓ᶿámqʷɬ] *cloud*, [t̓ᶿóʔčis] *seven*, [θát̓ᶿəm] *spring salmon*, [mə́nat̓ᶿɛ̀ʔ] *to beat a drum (in the traditional way)*, [ʔʌt̓ᶿ] *bay*.

/t/ voiceless alveolar stop

as in English [tɛnt] *tent*, [tawn] *town*, [tipi] tepee.

as in Sliammon [tíʔta ~ tí:ta] *that one*, [šɛ̀tqɛ́n] *upper lip*, [tíhmot ~ tí:mot] *really big*.

/t̓/ ejective alveolar stop

as in Sliammon [t̓ʌ́lɛk̓ ~ t̓ʌ́lɪk̓] *a hole*, [q̓át̓an ~ q̓át̓ən] *rat*, [ɬáʔgʌt̓] *herring*.

/ƛ/ voiceless lateral affricate (IPA tɬ) ; also informally referred to as "Charles A<u>tl</u>as"

as in Sliammon [ƛəpxʷ] *broke*, [ƛə́m̓ƛəm] *wet*, [ƛɪ́n̓ƛan] *real shy*, [x̌aƛ] *break (rope)*.

/ƛ̓/ ejective lateral affricate (IPA tɬ̓) ; also informally referred to as "Running Man"

as in Sliammon [ƛ̓áɬəm] *salt*, [ƛ̓áɬsəm] *strong*, [ƛ̓ʌ́m̓ƛ̓ʌm] *square*,

[x̌ʷɛ́ƛ̓ay] *mountain goat*, [x̌aƛ̓] *to want, to desire*, [mʌ́ƛ̓] *calm (water)*.

/č/ voiceless alveo-palatal affricate (IPA tʃ)

as in English [čɛst] *chest*, [čǽpəl ~ čǽpl̩] *chapel*.

as in Sliammon [číčiyɛʔ] *grandmother*, [píču ~ pɛ́ču] *basket*, [hoč] *I'm going*.

/č̓/ ejective alveo-palatal affricate (IPA tʃ̓)

as in Sliammon [č̓ɛ́ʔno] *dog*, [č̓ʌx̌] *ripe, cooked*, [č̓ɪɬ] *rain*, [č̓íč̓tiyəx̌] sandpiper,

[č̓ɔ́ʔč̓ɔʔ] *wren*, [č̓ʌq] *robin*, [sáʔč̓i] *tanned leather*, [x̌ɛ́č̓ič̓] *autumn, fall*, [páʔač̓] *net*,

[θíč̓] *straight*.

/k/ voiceless velar stop

as in English [kɛlp] *kelp*, [kíčən] *kitchen*, [kæč] *catch*.

as in Sliammon [kɛ́pu ~ kʸǽpo] *coat*, [kiks] *cookie*, [kí:kɛʔ] *bug*, [lə́klɛ ~ líklɛ] *key*,

[p̓əθk] *bullhead (fish)*.

/k̓/ ejective velar stop

as in Sliammon [k̓ɛ́k̓čɛʔ] *small basket for sewing; junk box*, [wàwak̓íla] *limpets*,

[k̓í:k̓ik̓ ~ k̓í:k̓ɛk̓] *crow*, [k̓ɛ́wk̓egɪm] *coyote*.

/kʷ/ voiceless labio-velar stop

as in Sliammon [kʷá:način] *sit down*, [kʷásəm] *ruffed grouse*, [k̓ʷúƛ̓kʷu] *salt water*,

[kʷúmaʔ] *ratfish*, [sénkʷu ~ sénkʷo] *ocean*, [məθkʷ] *blackcap berry*, [q̓aykʷ] *bald eagle*.

Similar to English [kwɛst] *quest*, and [kwɪlt] *quilt*, except that Sliammon kʷ functions as a single sound rather than a sequence of two sounds, as in English [kw].

/k̓ʷ/ ejective labio-velar stop

as in Sliammon [k̓ʷaʔ] *sliced salmon,* [k̓ʷót̓a ~ k̓ʷút̓a] *barbecuing stick,* [k̓ʷáʔwa] *belly, stomach* (external), [x̌áyx̌ek̓ʷus] *nightmare,* [tʌ́k̓ʷtuk̓ʷtas] *s/he is pulling it,* [ǰú:k̓ʷʊt] *smash it up,* [sésk̓ʷɩm̓ ~ sɛ́sk̓ʷɩm̓] *shaking,* [k̓ʷas] *hot.*

/q/ voiceless uvular stop

as in Sliammon [qəx̌] *many,* [qayx̌] *Mink (stage name),* [mə́qsɩn ~ mʌ́qsɛn] *nose,* [t̓áqa] *salal berry,* [šə́qθot] *sigh,* [ɬʌ́x̌qɛn] *raspy throat,* [pʌq] *white,* [ƛ̓ʌ́q] *out.*

/q̓/ ejective uvular stop

as in Sliammon [q̓át̓an ~ q̓át̓ən] *rat,* [q̓aʔƛ̓] *sea otter,* [gáq̓ɛt ~ gáʔq̓ɛt] *it's opened,* [sʌ́q̓t] *peel off s.t. (i.e. cherry bark); to split s.t.,* [ƛ̓ʌq̓] *rot,* [sʌ́q̓] *fifty cent piece, half.*

/qʷ/ voiceless labio-uvular stop

as in Sliammon [qʷʌl̓ ~ qʷəl̓] *he/she/they came,* [ɬóqʷmot] *saps running,* [qʷáqʷᵊlɛs] *copper,* [t̓ɛ́ʔnɛqʷ] *salmonberries,* [másɛqʷ] *sea urchin,* [ƛ̓oqʷ] *hard.*

/q̓ʷ/ ejective labio-uvular stop

as in Sliammon [q̓ʷɛt] *beach,* [q̓ʷɛ́x̌ʷ] *ashes,* [q̓ʷʌ́lq̓ʷaləs] *raccoons,* [táʔq̓ʷa] *devil fish, octopus,* [ɬoq̓ʷ] *clear skies,* [p̓oq̓ʷ] *grey, brown,* [x̌ʷɔʔq̓ʷ] *sawbill duck,* [t̓ᶿót̓ᶿoq̓ʷ] *feather.*

/ʔ/ glottal stop / laryngeal stop

as in English [ʔópən] *open,* [ʔo ʔo] *oh oh!,* [ʔǽpəl ~ ʔǽpl̩] *apple.*

as in Sliammon [ʔasxʷ] *seal,* [ʔɛ́ɬtən] *eat, food,* [ʔɛ:ʔ] *yes,* [xʷaʔ] *no,* [x̌ʷáx̌ʷᵊnɛʔ] *tidepool sculpin, bullhead, minoe,* [x̌áʔa ~ x̌á'a] *butter clam,* [né:ʔɛt] *be in the way,* [sáʔa] *two,* [šóʔot] *choose it,* [ǰɛ́ʔǰɛ] *tree, relative.*

/θ/ voiceless interdental fricative

as in English [θɩn] *thin*, [pæθ] *path.*

as in Sliammon [ʔáyʔajǔθəm] *language of our people; speak well,* [θóθɛn] *mouth,* [θɛ́ʔθa] *that one (fem.),* [məθkʷ] *blackcap berry,* [walθ] *bullfrog,* [qégʌθ] *deer.*

/s/ voiceless alveolar fricative

as in English [sɩlk] *silk,* [skɩn] *skin,* [smɛlts] *smelts.*

as in Sliammon [sáɬtxʷ ~ sáɬtw̥] *woman,* [q̓ə́sq̓əs] *tired of sitting,* [ǰínɛs] *tooth,* [ʔáʔləs] *sea cucumber.*

/ɬ/ voiceless lateral fricative

as in Sliammon [ɬáʔamɩn] *Sliammon people,* [ɬʌx̌] *bad,* [ƛ̓áɬəm] *salt,* [ƛ̓áʔɬʔom] *wolf,* [qʷáʔwɩɬ ~ qʷáʔwɛɬ] *pitch, chewing gum,* [púsɬaɬ] *Adam's apple.*

/š/ voiceless alveo-palatal fricative

as in English [šæg] *shag (cormorant),* [šɛl] *shell,* [šɩp] *ship.*

as in Sliammon [šɛʔ] *climb, go up,* [šqʌm̓s] *his/her partner,* [šɩm̓] *dry,* [šə́qθot] *sigh,* [ǰíšɩn] *foot,* [t̓íšəqʷ] *snot,* [tú:mɩš ~ túmɩš] *man,* [múšmuš] *cow,* [kʷíškʷiš] *Steller's jay.*

[xʸ] voiceless palatalized velar fricative

[xʷáʔᵊlowlàxʸɩn] *spiked heel, high heels*

Rare in occurrence and not well documented. This sound occurs as a variant of /š/.

/xʷ/ voiceless labio-velar fricative

as in Sliammon [xʷaʔ] *no,* [xʷʊ́ƛ̓aʔǰu] *trout,* [núxʷɩɬ ~ nóxʷɛɬ] *canoe,* [tíxʷθaɬ] *tongue,* [ʔaxʷ] *falling snow,* [ʔáʔaxʷ] *it's snowing.*

[w̥] voiceless labio-velar glide -- variant of /xʷ/

as in Sliammon [ʔáʔǰɛčxʷʔot ~ ʔáʔǰɛčw̥ʔot] *how are you (sg)?*, [ʔasxʷ ~ ʔasw̥] *seal,* [ǰɛnxʷ ~ ǰɛnw̥] *fish,* [t̓ᶿómaʔǰuw̥ ~ t̓ᶿómaʔǰuxʷ] *barnacle.*

/x̌/ voiceless uvular fricative

as in Sliammon [x̌áʔa] *butter clam,* [x̌áw̓s] *new,* [x̌áwgəs] *grizzly bear,* [x̌áwšɩn ~ x̌áwšin] *bone,* [sə́x̌əm] *racing canoe,* [yʌ́x̌t] *rib,* [x̌ɛ́x̌yɛq̓] *crab,* [qəx̌] *many,* [ƛ̓áƛ̓atɛx̌] *grasshopper.*

/x̌ʷ/ voiceless labio-uvular fricative

as in Sliammon [x̌ʷɛ́ƛ̓ay] *mountain goat,* [x̌ʷéyt] *stretch it,* [x̌ʷáx̌ʷᵊnɛʔ] *tidepool sculpin, bullhead, minoe,* [t̓ᶿóx̌ʷo] *ling cod,* [p̓ɛx̌ʷ] *flood,* [ǰɛx̌ʷ] *to melt.*

/h/ voiceless laryngeal / glottal fricative

as in English [hɛ́mlɑk] *hemlock,* [hɛlp] *help,* [hɛlo] *hello.*

as in Sliammon [háʔᵊmo] *pigeon,* [hɛ́ʔgɩn] *strawberry,* [hánaqʷos] *wolf eel, aggressive,* [háhasəmč] *I'm sneezing,* [hóm̓hom] *blue grouse,* [hɛ́hawčɩs] *paddling,* [hɛ́hɛgʌɬ] *for the first time,* [tih ~ ti:] *big, large,* [ʔah] *sore, pain,* [qʌht] *to lift up.*

/m/ bilabial nasal

as in English [mɛ́mo] *memo,* [mɛlt] *melt*, [mæsk] *mask,* [mǽgnɩt] *magnet.*

as in Sliammon [man ~ mʌn] *father,* [mʌ́gʌ] *cougar,* [čúxʷmɛn] *a week,* [námʔʌm] *to write,* [tam] *what?*

/m̓/ laryngealized bilabial nasal

as in Sliammon ham̓u [háʔᵊmo] *pigeon,* sam̓a [sáʔma] *mussel,* [šɩ́m̓šɩm] *it's already dried,* təm̓ [tə́mʔ] *belt,* [ɬóɬmòm̓] *littleneck clam,* x̌ʷáx̌ʷayɩm̓ [x̌ʷáx̌ʷayɩmʔ] *housefly.*

/n/ alveolar nasal

as in English [not] note, [nɑtɪkəl] nautical.

as in Sliammon [níɡin] *lunch,* [níɡinàyɛ] *lunch basket,* [nat ~ nʌt] *night,* [ǰínɪs] *tooth,* [x̌ʷá:stʌn] *suet,* [tan ~ ta:n] *mother.*

/ṅ/ laryngealized / glottalized alveolar nasal

as in Sliammon ƛ̓iṅa [ƛ̓ɛ́ʔna] *oolichan oil,* č̓aṅu [č̓ɛ́ʔno] *dog,* [taṅ ~ tanʔ] *that one.*

/l/ lateral liquid

as in English [lek] *lake,* [lɪft] *lift.*

as in Sliammon [lástpol ~ láspol] *soccer ball,* [líkᵊlɛ ~ líkᵊle] *key,* [láplàš] *plank, long board,* [čɛ́ᵊlʌs] *three,* [ʔɛ́lq̓ay] *barbecued deer meat,* [ʔátnopὲl] *car, automobile.*

/l̓/ laryngealized/ glottalized lateral

as in Sliammon ʔal̓əs [ʔáʔləs] *sea cucumber,* [qʷəl̓] *to come,* [pal̓ ~ palʔ] *heron, crane.*

/y/ alveo-palatal glide

as in English [yɛs] *yes,* [yɛl] *yell,* [yóɡə] *yoga,*

as in Sliammon [yʌ́x̌ay ~ yɛ́x̌ay] *berry basket,* [yɛ́ɬat] *to call s.o.,* [yɛ́ʔɡay] *inner cedar bark,* [yɛ́q̓ɛt] *disgusted with it, need it,* [pí:payɛ ~ pé:payɛ] *one person,* [yíyq̓ɛt] *easy, inexpensive,* [θáʔqay ~ θáʔqʌy] *sockeye salmon.*

/ẏ/ laryngealized/ glottalized alveo-palatal glide

as in Sliammon qáẏa [qáʔyɛ] *water,* saẏǰa [sáʔyǰɛ ~ sáẏǰɛ] *leaf,* [čí:čuẏ] *children,* [ƛ̓ʌ́ƛ̓x̌ʌẏ] *elder,* [sí:saẏ ~ sáysaẏ] *be scared.*

/ǰ/ (voiced) alveo-palatal affricate (non-continuant resonant)

as in English [ǰɛlifɩš] *jellyfish.*

as in Sliammon ǰəƛ̣ [ǰɩƛ̣] *run,* [ǰɩ́čeyš] *spear for cod and cod eggs,* [ǰɩ́nǰɩnɛs] *teeth,* [s.ǰɛ́sɔɬ] *yesterday.*

/w/ labio-velar glide

as in English [wɑsp] *wasp,* [wɑš] *wash*

as in Sliammon [walθ] *bullfrog,* [wʌ́x̌ʌs] *frog,* [páwʔus] *one dollar,* [qawθ] *potatoes,* [yɩ́ʔgaw] *partically dried, dried up,* [ɬʌ́x̌aw] *gone bad.*

/ẇ/ laryngealized/glottalized labio-velar glide

as in Sliammon k̓ʷáẇa [k̓ʷáʔwa] *belly, stomach (external),* [x̌éẇx̌aʔgʌɬ] *chipmunk,* [wɩ́ẇlos] *young man,* [mé:mʌẇ] *cat,* [təẇ ~ tuʔ] *ice.*

/g/ (voiced) velar stop (non-continuant resonant)

as in English [gem] *game,* [gost] *ghost.*

as in Sliammon [gáq̓et] *it's opened,* [gɩ́ǰɛ] *earth, land,* [tɩ́gʸəxʷ] *nine,* [páʔagɩɬ] *one boat,* [θóga, θógi, hóga] *go,*

Vowels

[i] high non-back tense oral vowel

as in English [ski] *ski,* [pítsə] *pizza,* [súši] *sushi,* [piǽno] *piano.*

as in Sliammon [tíxʷθaɬ] *tongue,* [x̌éč̓ič̓] *fall,* [kʷíškʷiš] Steller's jay, [sk̓ʷíči] *bothersome, pesty.*

[ɩ] high non-back lax oral vowel

as in English [fɩš] *fish,* [swɩm] *swim,* [kɩnšɩp] *kinship.*

as in Sliammon [ǰɩ́nɩs] *tooth,* [ǰɩƛ̣] *run,* [č̓ɩɬ] *rain,* [θɩč̓] *straight.*

[e] mid non-back tense oral vowel

as in English [gem] *game*, [snek] *snake*, [snel] *snail*.

as in Sliammon [qégʌθ] *deer*, [qʷéyqʷay] *sand*, [sénkʷu ~ sénkʷo] *ocean*.

[ɛ] mid non-back lax oral vowel

as in English [nɛt] *net*, [kɛlp] *kelp*, [ǰɛt] *jet*, [šɛl] *shell*.

as in Sliammon [ʔɛ́ɬtən] *eat, food*, [k̓ɛ́k̓čɛʔ] *small basket for sewing, junk box*,

[qɛ́qtɛʔ] *youngest in family*, [hɛ́wqɛn] *swan*, [k̓ʷɛn] *how many*, [x̌ɛ́x̌yɛq̓] *crab*.

[u] high back rounded tense oral vowel

as in English [flut] *flute*, [glu] *glue*, [flu] *flu*, [plúto] *Pluto*, [súmæk] *sumac*.

as in Sliammon [kʷúsɛm] *green, blue*, [múšmuš] *cow*, [ɬuk̓ʷ] *to fly*,

[kʷúkʷpaʔ] *grandfather*, [wuk̓ʷ] *scoop net*.

[ʊ] high back rounded lax oral vowel

as in English [hʊk] *hook*, [pʊt] *put*

as in Sliammon [kʷʊ́θays] *island*, [kʷúmʊkʷt] *red blanket*, [tʊ́k̓ʷt] *pull it*.

[o] mid back rounded tense oral vowel

as in English [foks] *folks*, [most] *most*, [pok] *poke*, [smok] *smoke*, [tótəm] *totem*.

as in Sliammon [t̓ᶿót̓ᶿoq̓ʷ] *feather*, [ƛ̓oqʷ] *hard*, [ɬoq̓ʷ] *clear skies*, [ɬóq̓ʷɬoq̓ʷ] *oysters*,

[ɬóqʷmot] *saps running*, [hóm̓hom] *blue grouse*, [t̓ᶿóx̌ʷo] *ling cod*,

[ɬóɬmòm̓] *littleneck clam*, [k̓ʷóʔoxʷ] *smoked salmon*.

[ɔ ~ ə] mid back rounded lax oral vowel

similar to the [ɔ] in English [hɔrn] *horn* ,

as in Sliammon [x̌ʷɔʔq̓ʷ] *sawbill duck*, [ǰɔ́qʷǰɔqʷ] *warm water*, [sǰɛ́sɔɬ] *yesterday*,

[ʔámamɔ̀ʔ] *chiton*, [k̓ʷón̓ɔt̓] *porpoise*.

[æ] low non-back tense oral vowel

as in English [læmp] *lamp*, [gæf] *gaff*, [klæm] *clam*.

as in Sliammon [kʸǽpo] *coat*, [č̓ɛ́č̓æt̓ən] *mouse*, [kǽmpùts] *rubber boots*, [kʷínæčxʷ] *you carry it*.

[a] low central oral vowel

as in Sliammon [ɬík̓ʷƛ̓ač] *gunny sack*.

[ɑ] low back oral vowel

as in English [swɑn] *swan*, [swɑmp] *swamp*, [pɑt] *pot*, [kɑd] *cod*.

as in Sliammon [sɑ́ʔɑ] *two*, [ʔɑsxʷ] *seal*, [k̓ʷɑ́xʷɑʔ] *box*, [t̓ɑ́qt̓ɑq] *slow*.

[ə] mid central lax oral vowel

as in English [əgó] *ago*, [fókəs] *focus* .

as in Sliammon [tátəmčxʷ] *what are you doing?*

[ʌ] low-mid back oral vowel

as in English [bʌt] *but*.

as in Sliammon [wʌ́x̌ʌs] *frog*, [sópnʌč] *tail*, [č̓ʌx̌] *ripe, cooked*, [qʌx̌] *many*.

Diphthongs

[iy ~ i:]

as in Sliammon [tíymot ~ tí:mot] *really big* < /tih-mut/,

[ey]

as in Sliammon [ǰíčeyš] *spear for cod and cod eggs*, [x̌ʷeyt] *stretch it*.

[uy]

as in Sliammon [need example].

[uỷ] as in Sliammon [čuỷ] *child*, [čí:čuỷ] *children*,

[ay]

as in Sliammon [q̓aykʷ] *eagle*, [qayx̌] *Mink (stage name)*, [x̌ʷɛ́ƛ̓ay] *mountain goat*, [p̓ʌ́gay] *halibut*, [yʌ́x̌ay ~ yɛ́x̌ay] *berry basket*, [páʔayč̓] *appendix*.

[əy ~ ʌy]

as in Sliammon /say=an̓a/ [sʌ́yɛʔna] *neck*, [yɛ́ʔgʌy] *inner cedar bark*.

[ʌỷ]

as in Sliammon ƛ̓aƛ̓x̌aỷ [ƛ̓ʌ́ƛ̓x̌ʌỷ] *elder*,

[iẅ] as in Sliammon [wíẅlos] *young man*.

[ew] as in Sliammon [x̌ʌ́ƛ̓ews] *pluck a bird, feather a bird*, [pewɬ] *lard, rendered-down fat*

[eẅ] as in Sliammon [x̌éẅx̌aʔgʌɬ] *chipmunk*

[ɛw] as in Sliammon [t̓ᶿɛwq̓] *red elderberry*

[uẅ] as in Sliammon [yuẅ ~ yəẅ] *it's been raining, dried up*

[ow] as in Sliammon [xʷál̓owlàxʸɪn ~ xʷáʔᵊlowlàxʸɪn] *spiked heels, high heels*.

[aw] as in Sliammon [páwʔus] *one dollar*, [x̌áwgəs] *grizzly bear*, [qawθ] *potato*, [t̓ᶿáp̓aw] *busy*

[aẅ] as in Sliammon [x̌aẅs] *new*.

[əw] as in Sliammon [ʔə́wʔəwəkʷ] *lots of tobacco* [ʌw̓] as in Sliammon mimaw̓ [mé:mʌw̓] *cat*

[əw̓] as in Sliammon [təw̓ ~ tuʔ] ice.

[oy] as in Sliammon [ƛ̓əq^wo:yɛ] *summer.*

Surface Long Vowels

[i:] as in Sliammon [k̓í:k̓æk̓ik̓] *blackbird,* [k̓í:k̓ik̓ ~ k̓í:k̓ɛk̓] *crow,* [tí:tɔlk^wum] *small roots,* [ǰí:ƛ̓ čɛp] *you (pl) are running,* [tí:ta ~ tíʔta] *that one,* [θí:θa ~ θíʔθa ~ θέʔθa] *that one (fem.),* [ƛ̓í:č̓os ~ ƛ̓í:č̓ʊs] *Spring,* [kí:kɛʔ] *bug,* [čí:čuy̓] *children,* [ɬí:č̓ɩm]*comb hair,* [sí:say̓ ~ sáysay̓] *scared.*

[e:] as in Sliammon [hé:ynʌč ~ híynʌč]*bottom of a basket,* [pé:payɛ] *one person,* [né:ʔɛt] *be in the way,* [mé:mʌw̓] *cat.*

[ɛ:] as in Sliammon [q̓έ:sɛt] *to tie it,* [x̌έ:x̌nʌq̓ ~ x̌έʔɛx̌nɛq̓] *Owl's Grove (sacred place),* [ǰέ:q̓^wam] *sweat,* [q̓^wέ:tam̓] *front of the house (faces the beach q̓^wɛt),* [ʔɛ:ʔ] yes

[u:] as in Sliammon [ɬú:k^wumɩn ~ ɬú:k^wumɛn] *bailer,* [ǰú:k̓^wʊt] *smash it up,* [ǰu:k̓^w ~ ǰuʔk̓^w] *Indian rice,* [sú:k̓^wam] *outer cedar bark,* [ǰú:p̓ayš] *step over.*

[o:] as in Sliammon [x̌^wó:q̓^wɛt] *s.o. snoring (in that state),* [mó:la ~ mó:lʌ] *mill.*

[a:] as in Sliammon [p̓á:p̓ɛmč] *I'm working (right now),* [ƛ̓á:ɬawʊm] *any berry,* [ʔá:yɛʔ] *house.*

[ɑ:] as in Sliammon [q^wɑ́:q^wɑq̓] *woodtick,* [k^wɑ́:næčɩm] *sit down,* [x̌^wá:stʌn] *suet,* /ʔah-sx^w č/ [ʔɑ́:sx^wč] *I'm hurt* (cf. ʔah *be hurt, sore*).

El Mar

Necesito del mar porque me enseña: no sé si aprendo música o conciencia: no sé si es ola sola o ser profundo o sólo ronca voz o deslumbrante suposición de peces y navíos. El hecho es que hasta cuando estoy dormido de algún modo magnético circulo en la universidad del oleaje.

Pablo Neruda

Chapter 1: Introduction

1.0 General Introduction

Sliammon is a Central Coast Salish language spoken just north of Powell River on the Malaspina Peninsula at Sliammon, British Columbia, Canada (cf. Appendix I on Salish Languages, as well as Czaykowska-Higgins and Kinkade (1998)). The term "Sliammon" is used here in this thesis as a cover term to refer to the language of the Homalco, Klahoose, and Sliammon people currently living in Sliammon, B.C. The language is currently spoken by approximately 40 of the 800 residents of Sliammon. According to a number of elders that I have consulted, the Homalco, Klahoose and Sliammon consider themselves "one people with one language".

Traditionally, the Sliammon, Klahoose and Homalco people utilized a vast area of land and waterways for traditional harvesting of annual salmon runs, berry-picking, and hunting. Their traditional territory extends along both sides of the northern Strait of Georgia from Malaspina Strait, in the south, to Desolation Sound and Homfray Channel, to the head of both Toba and Bute Inlets in the north, and the islands between the Mainland and Vancouver Island. These islands include Texada, Harwood, Savary, Hernando, Mitlenatch, Marina, Cortes, West Redonda, East Redonda, Sonora, Stewart and Dent Islands, amongst others (cf. for example Barnett 1955; Kennedy and Bouchard 1983; Sliammon Treaty Society).

Today, many of the Homalco, Klahoose and Sliammon people live at Sliammon, B.C., located just north of the city of Powell River. There is a community at Squirrel Cove on Cortes Island, and many of the Homalco people moved to Homalco Reserve located on Vancouver Island (near Campbell River), when the last families left the Church House village site.

The name Sliammon is an anglicization of /ɬaʔamin/ [ɬáʔamɪn], a term which refers to the Sliammon people. The word /t̓išus-m/ [t̓éšosəm] is the place name which refers to Sliammon Bay, Sliammon Creek, and to the Sliammon village which is located near the mouth of the creek. One elder explained that this place name is clearly related to the term /DIM-t̓išus/ [t̓ét̓šos] which refers to 'a small saltwater fish' which occupies the large tidepool in front of Sliammon.

The language has also been referred to as Mainland Comox or Comox in previous ethnographic and linguistic research which was intended to indicate the dialect spoken by the Homalco, Klahoose, and Sliammon peoples living on the Mainland in contrast to the Island Comox dialect, originally spoken on Vancouver Island. "Mainland Comox" is a designation which is dispreferred by current speakers of the language since they associate "Comox" with the name of the town of Comox, B.C. which is located in what is now Kwakwakawa'kw or Kwakwala-speaking territory.

Some people have referred to the language as [ʔáyʔaǰùθəm]. However, as one Sliammon elder explained [ʔáyʔaǰùθəm] means to 'speak well' (from the root /ʔǰ̓/ [ʔiʔ ~ ʔi:] *good*); so, it could be used to describe someone who speaks English well, or French well, or any other language, and is not restricted in its use to mean 'the language of the Homalco/Klahoose/Sliammon people'. In short, different people have expressed varying opinions regarding the appropriate use and meaning of this word.

There are also separate terms which combine a place name or the name of people living there with the lexical suffix =qin for 'mouth, language' to indicate the local variety of the language spoken by a person from that particular location: [ɬáʔamɪnqɛ̀n] /ɬaʔamin=qin/ 'Sliammon language', [tóʔqʰqɛ̀n] /tuʔq=qin/ 'Klahoose/Squirrel Cove language', and [ʔóʔpʰqɛ̀n] /ʔuʔp=qin/ 'Homalco/Church House language'. However, there also is some discussion regarding the grammaticality of words with the addition of =qin meaning 'language of x', and therefore without consensus on the part of the speakers, it would not be appropriate to use this type of construction as a designation for the language. As researchers and visitors, we are looking to the Homalco, Klahoose, and Sliammon people for guidance regarding an appropriate name for their language. In the meantime, in this present work I will continue to use the name "Sliammon" as a cover term which includes speakers of Homalco, Klahoose, and Sliammon living at Sliammon, B.C. The community has plans to discuss an appropriate name for the language by consulting with Elders from all three bands: Sliammon Band, Klahoose Band (Squirrel Cove), and Homalco Band in Campbell River.

There seem to be very few differences between speakers which can be clearly attributed to "dialect" differences. There are a few lexical items which seem to have restricted distribution or specific pronunciation of individual lexical items, such as /ǰanxʷ/ [ǰɛ́nxʷ] 'salmon, fish' versus /ǰanx̌ʷ/ [ǰɛ́nx̌ʷ] 'salmon, fish'; note that a Sliammon consultant provided this word with a final velar fricative /xʷ/ whereas a Klahoose speaker systematically used the corresponding uvular fricative /x̌ʷ/. Nonetheless, these differences seem to be very limited. There may also be a differences in the rate of speech which are readily perceived by native speakers of the language; these latter are not documented in the present work.

There are concerted efforts on the part of the Sliammon, Homalco and Klahoose people to revitalize the use of their language. The Sliammon Language Program in the Powell River School system (accredited by the Ministry of Education) teaches children from kindergarten to grade 12, the language spoken by the Homalco, Klahoose and Sliammon people. The emphasis of the program is on spoken language and oral fluency in its cultural context.

The primary source of the data in this dissertation is my fieldnotes collected from 1988 through 2000 in consultation with Sliammon elders, especially: Mrs. Mary George, Mrs. Agnes McGee, Mrs. Phyllis Dominic, and Mrs. Eva Hanson. Additional data were collected and/or verified with the following elders and/or speakers: Mrs. Annie Dominick, Mr. Dave Dominick, Mrs. Helen Hanson, Mrs. Marion Harry, Mr. Pete Harry, the late Mr. Joe Mitchell, Mrs. Elsie Paul, Mrs. Sue Pielle, and Ms. Betty Wilson. The collaborative Sliammon/UBC orthography workshops held in Sliammon during the summers of 1996-1998 also provided a forum for re-checking additional data. To these many elders who patiently contributed their expertise, I am deeply grateful. Although the majority of my fieldwork was carried out at Sliammon, I also benefited tremendously from working with two Sliammon elders who were residing/visiting Vancouver, and therefore provided the opportunity of meeting on a weekly basis.

In addition to tape recordings, there are two video recordings which were filmed in collaboration with the Sliammon community under the auspices of the UBC Teaching and Learning Enhancement Fund (TLEF), awarded to Dr. Patricia A. Shaw. This video film footage is to be incorporated into multimedia curriculum materials to enhance the community-based teaching of the Sliammon language in traditional cultural contexts. The collaboration and team work involved in these sessions has been invaluable.

1.1 Goals of the Dissertation

The goals of this dissertation are two-fold. My first major descriptive goal is to contribute to the basic documentation of the language spoken by the Sliammon, Klahoose and Homalco peoples. It is my hope that the language data contained within this dissertation will be useful to the Sliammon community and will help further their efforts in language education.

My second major goal is to present an analysis of the distribution and representation of schwa[1] in Sliammon. This is of both descriptive and theoretical interest. Schwa is the brief "neutral" vowel [ə] which shows special phonological properties in many languages. It is central to an understanding of the Sliammon phonology and morphology. It is argued here that there are three different "kinds" of schwa in Sliammon, as evidenced by their phonological behaviour: (i) excrescent schwas, (ii) epenthetic schwas, and (iii) reduced full vowels, which have the same prosodic structure as schwa.

One of the major goals with respect to the distributional restrictions is to demonstrate that the surface constraint (or constraints) which bans schwa in stressed open syllables (informally abbreviated as, $*\acute{ə}]_\sigma$) plays a central role in the organization of the grammar of the language. The phonological constraint $*\acute{ə}]\sigma$ when combined with other constraints within the grammar of Sliammon has far-reaching implications for the phonological and morphological structure of the language.

[1]The symbol schwa [ə] comes from the Roman alphabet; it is a lower-case e which has been rotated 180°. The name schwa or shva (Hebrew sh'wa) comes from traditional Hebrew grammar, according to Pullam and Ladusaw (1986) who cite Prokosch (1939:94).

I am assuming the general model of Optimality Theory in which constraint interaction, conflict and minimal violation determine the optimal output candidates, following Prince and Smolensky (1993), McCarthy and Prince (1993 et seq.), and many subsequent works that have been stimulated by the evolution of this research paradigm.

This thesis presents continued research which I began in the context of my M.A. Thesis (Blake 1992) and addresses several outstanding issues which were raised there. In Blake (1992: 43-45), I observe that schwa in Sliammon tends to occur in the following two contexts: (a) in an unstressed closed syllable (i.e. minimally a CəC syllable) or (b) in an open syllable which bears primary stress, as illustrated by the data in (1-2) (for an overview of the transcription system adopted here, see Guide to Pronunciation (pp.xv-xxvi); Chapter 2; and Appendices III and IV).

(1) Schwa in closed syllables: CəC

	Input[2]	Schwa epenthesis	Output	Gloss
a.	PL-pq	pəqpəq	pʌ́qʰpʌqʰ	*all white*
b.	t̓in-ʔm	t̓inʔəm	t̓ɛ́nʔəm	*to barbecue (salmon)*

(2) Schwa in stressed open syllables: Cə́

	Input	Schwa epenthesis	Output	Gloss
a.	IMP-ƛ̓pxʷ	ƛ̓əƛ̓əpxʷ	ƛ̓ə́ƛ̓əpxʷ	*become broken*
b.	t̓ᶿkʷa[3]	t̓ᶿəkʷa	t̓ᶿə́kʷa	*edible root*
c.	ngi	nəgi	nɪ́gi	*you (sg)* (Indep.)

[2] Although there are no constraints on inputs within OT, I have provided Input forms (underlying representations) which conform to the following principles: (i) each morpheme has a single underlying representation or "Input form" for phonologically-conditioned allomorphs, and (ii) the Input only contains unpredictable information. It has been shown by many phonologists working within OT that when GEN creates other Inputs, the surface phonological and morphological constraints of the grammar will nonetheless converge to select the same optimal form. I therefore do not show multiple Inputs for the set of output candidates in this context. Here, the important point is that the surface distribution of schwa is determined by the constraint ranking regardless of whether or not it is present in the Input form. cf. Matthewson (1994: 38) for similar discussion regarding schwa in Lillooet (Salish).

[3] This edible root grows in clumps and is prepared in a traditional rock-pit fire. It is steamed, peeled and eaten. MG calls them 'Indian bananas' due to their characteristic yellow colour, clustering bunches, and the fact that they are easily peeled (once cooked). This root, along with sea urchin, is considered a delicacy. The plant itself is a fine-stemmed fern. These roots may well be the rhizomes of the spiny woodfern.

Although schwa *does* appear to occur in stressed open syllables as shown by the data in (2) above, there are also a number of strategies which are employed in order to avoid stressed schwa in an open syllable, as shown by the data in (3).

(3) Avoidance of stressed schwa in an open syllable

	Input		Output	Gloss	
a.	θt̓ᶿm	θət̓ᶿəm	θáʔt̓ᶿəm	*jig for cod*	O' restructuring
b.	θy̓m	θəy̓əm	θáʔyɪm	*to sink*	R' restructuring
c.	t̓ᶿx̌u	t̓ᶿəx̌u	t̓ᶿɔ́x̌ʷ:ɔ	*ling cod*	Gemination
d.	p̓θ=iqʷan	p̓əθ[h]iqʷan	p̓ʌ́θhɛqʷʌn	*black hair*	[h] epenthesis
d'.	č̓x̌=iqʷan	č̓əx̌[h]iqʷan	č̓ɛ́x̌hɛqʷʌn	*black hair*	[h] epenthesis
e.	pq=iqʷan	pəq[ʔ]iqʷan	pʌ́qʔɛqʷʌn	*blonde hair*	[ʔ] epenthesis
f.	pxʷm+[i]	pəxʷim	púxʷɛm	*steam*	V-strengthening

These various different strategies include Glottal Restructuring (3.a-b), Gemination (3.c); [h] or [ʔ] epenthesis (3.d-e), and Vowel strengthening (3.f). What all of these strategies in (3) have in common is that they prevent schwa from occurring in a stressed open syllable, thus avoiding violation of the constraint *ə́]$_\sigma$.

The contrast between (2-3) raises the following question: under what set of conditions does schwa occur in stressed open syllables? The proposal made in this thesis is that the constraint which aligns the head of the prosodic word (PrWd) to the left-edge of the lexical stem outranks the constraint against stressed schwa in an open syllable. This means that it is more important for primary stress to be properly aligned with the left-edge of the stem domain than it is to obey the constraint which bans stressed schwa in open syllables. In this context, schwa will occur in a stressed open syllable, if no other strategy militates against it.

In this thesis, I claim that the surface distribution of schwa in Sliammon is predictable from surface prosodic constraints. For example, schwa surfaces between a word-initial consonant cluster in order to satisfy the high-ranking constraint against Complex Onsets in the language.

Schwa is also epenthesized in order to satisfy Proper Headedness, the requirement that the syllable which is the head of a Foot contains a nucleus, as shown by the contrast between stressed initial Cǝ́C syllables versus final Minor syllables (CC) which have no vocalic nucleus, as will be argued in Chapter 3.

Shaw (1993, 1995, 1996c) characterizes schwa as *non-lexical, featureless and non-moraic,* drawing on evidence from a wide-range of languages including the Salish languages Sťáťimcets (Lillooet) and Nuχalk (Bella Coola). Kinkade (1998: 208) argues that epenthetic schwa in Upper Chehalis is both *non-moraic* and *unspecified for phonological features*, providing comparative evidence supporting the proposed representation of schwa in Sliammon.

This dissertation also aims to contribute to the cross-linguistic studies of schwa in other Salish languages: Bagemihl (1991) on Bella Coola, Matthewson (1994), Roberts (1993), Roberts & Shaw (1994), Shaw (1993, 1994, 1996) on St'át'imcets (Lillooet), Bianco (1996) on Cowichan, Willet and Czaykowska-Higgins (1995) on Nxa'amxcín (Moses-Columbian), and Kinkade (1998) for Upper Chehalis, so that a cross-linguistic perspective on the behaviour of this vowel emerges.

1.2 Previous scholarship on Sliammon language

Early scholarship on the Sliammon (Comox) language and culture includes: Haeberlin (1918), Sapir (1915), Boas and Haeberlin (1927), Swadesh (1950), Swadesh (1952), and Barnett (1955), amongst others.

There are also a growing number of papers which appear in the pre-prints for the International Conference on Salish (and Neighboring) Languages; these include: J. Davis (1971a, 1970b, 1971, 1973), Bouchard (1971), Hamp (1971), Harris (1975), Hagège (1976), Kroeber (1988), Watanabe (1994b, 1996) and Blake (1997a, 1999), most of which are based on fieldwork on the language.

Hagège (1981) produced a descriptive grammar of the language written in French (cf. Kroeber (1989) for a critical review). J. Davis (1970), Blake (1992), and Watanabe (1994a) are Masters Theses on the language, focusing mainly on basic aspects of the phonology and

Reduplication. Watanabe (2000) is a detailed description of the Morphology of the language which documents a number of aspects of the language which have not been discussed elsewhere.

Research on the syntax of the language includes papers by J. Davis (1973, 1978a, 1978b), and Blake (1996, 1997a) on basic clause structure and Passives in Sliammon. Kroeber (1991, 1999) includes many syntactic examples of MComox (Homalco, Klahoose, Sliammon) in the broader context of his research on comparative Salish syntax, and are based on his own fieldwork on the language in the early 1980s. Harris' (1981) dissertation is on the Island Comox dialect; the speaker he worked with the late Mrs. Clifton, passed away several years ago. No other individuals are known to speak this dialect.

There is also a growing body of fieldnotes on the language including: H.G. Barnett UBC Special Collections; W. Suttles (n.d.) Sliammon fieldnotes; J. Davis (1969-1970); Kennedy and Bouchard (1971-1981); P. Kroeber (early 1980s); Blake (1988-2000); Watanabe (1990-2000) collaborative Sliammon-UBC TLEF Project under the direction of Dr. Patricia A. Shaw (1996-1998), and S. Urbanczyk (1998) working on Klahoose, Cortes Island, B.C.

Kennedy and Bouchard's (1983) publication entitled *Sliammon Life, Sliammon Lands* reports on detailed ethnographic research from (1971-1981).

1.3 Theoretical Framework

1.3.1 Representations adopted in this Dissertation

The issue of representation is one which is particularly challenging. I will briefly discuss some of the most common issue regarding documentation, transcription, and levels of representation.

Previous work on the language such as Sapir (1915), J.Davis (1970, 1971), Blake (1992), Watanabe (1994a) include the surface phonetic forms for most if not all examples. One of the potential drawbacks is that a phonetic representation may include a lot of information which is non-contrastive. Nonetheless, a distinct advantage of including all of the surface phonetic forms is so that the reader can readily compare this level of representation with the more abstract phonemic representation, and future scholars will be able to make new hypotheses based on this surface phonetic data. It therefore seems preferable to me to include as much phonetic detail as possible.

At the same time, for practical reasons many forms are not transcribed with comparable phonetic detail. Any phonetic transcription is an abstraction to some degree. The process of transcribing what one hears is, of course, the first level of analysis. In the chapters to follow, the representation adopted for any set of data is somewhat dependent upon the focus of a particular section. The reader is therefore referred to Chapter 2, where I discuss many of the most frequently occurring allophonic processes which have been the focus of my research on the language. Because of the inevitable variation attested in the speech of any individual or of different individuals within a speech community, the reader is urged to cross-reference all of the available sources on the language in order to ascertain the range of variation in both underlying representation and surface forms.

The representations adopted in this thesis are as follows: phonemic (Input) form and surface (Output) representation. In addition, I often provide for the reader an "intermediate" form which abstracts away from certain aspects of the consonant/vowel interaction in order to make the discussion at hand easier to follow. For example, reconsider the data presented earlier in (1), the first sets of which are reproduced for ease of reference here:

(1) Schwa in closed syllables: CəC

	Input	Schwa epenthesis	Output	Gloss
a.	PL-pq	pəqpəq	pʌ́qʰpʌqʰ	*all white*
b.	t̓in-ʔm	t̓inʔəm	t̓ɛ́nʔəm	*to barbecue (salmon)*

The data in column 3 the "Output" represents the surface phonetic level, showing in this case the effects of C-V interactions. Even narrower phonetic transcriptions will sometimes appear in square brackets [ ], when they are used. The data in column 2 abstract away from some of the phonetic detail in Column 3, e.g. vowel height assimilation to adjacent consonants (i ~ ɛ) ; schwa colouration (ə ~ ʌ) ; aspiration of stops (q ~ qʰ) etc. The data in Column 1 represent an abstraction: the kinds of phonological information which are predictable are not present, e.g. /i/ is regularly realized as [ɛ] following a glottalized obstruent; a stop /q/ is regularly aspirated ....etc. Column 4 provides a short

English translation. The reader is referred to Chapter 2 and the Appendices for further exemplification.

In each section, I have tried to indicate clearly what phonological properties I am attempting to account for, as well as clearly indicate what properties are to be discussed elsewhere, or are simply not handled in the context of this thesis. Inevitably and regrettably, this thesis is also finite, and discusses only a fraction of the very fascinating linguistic processes integral to this language.

Nonetheless, an area in which I have tried to pay particular attention to detail is in my transcription of the phonetic vowel quality. I have also focused specifically on the realization of glottalized resonants and obstruents, aspiration of syllable-final consonants, the allophonic realization of schwa, and native speaker judgements regarding morafication and syllabification.

Areas which remain particularly problematic both for description and for analysis include stress/pitch interaction and the placement of secondary stress. In cases where I could not decide whether or not there was a secondary stress, I did not mark stress. Therefore, because a form is not marked with secondary stress does not imply that secondary stress does not occur in this word/phrase rather it simply may not be indicated. Primary stress is marked throughout. See §3.3 for further discussion.

It should also be noted that there is a considerable range in variation both within a single individual's speech and across speakers within a community, some documentation of which can be found in Davis' (1970) work. The range of variation is also documented in this thesis by listing the variants. For example, the word for *coat* is pronounced in a variety of ways: [kápo ~ kʸǽpo]. The tilda [~] separates one variant from another.

The phonemic or Input forms adopted in this thesis and those labelled in Watanabe (2000) as //morpho-phonemic// are similar. Watanabe (2000) does not take into account the effects of syllabification and foot formation in driving vowel reduction, schwa colouration, or vowel height assimilation. His surface representations have phonemic vowels and he generally abstracts away from consonant/vowel interaction. These differences may appear to be significant on the surface but are the result of different focus and investigation of different linguistic properties of the language. I have made a number of choices with respect to representations which attempt to minimize these differences. For example, to be consistent with Watanabe (2000a) I use /ǰ, g/ in the present work rather than the archi-phonemes /Y, W/ of Blake (1992). I have also adopted /i, u, a/ rather than /e, o, a/ for ease of comparison.

1.3.2 Theoretical Models of Phonology

The analysis presented in this dissertation is predicated on two major theoretical claims made within the general theory of phonological systems.

First, I adopt Shaw's (1996c) claim which argues that "an adequate theory of syllable structure must recognize both Nuclear headedness and moraic weight as independent structural properties." Shaw's claims are formulated in Optimality Theoretic terms. In particular, she has proposed the addition of the constraint SYLL MORA which ensures that all syllables have phonological weight. The analysis presented in this thesis draws significantly on Shaw's claims.

Second, I adopt the general model of Optimality Theory (OT), following Prince and Smolensky (1993), McCarthy and Prince (1993 et seq.). OT is a model of output constraints in which constraints are ranked with respect to each other. All constraints are in principle violable, and there is constraint interaction and conflict. An optimal output candidate will often violate a lower-ranking constraint in order to satisfy a higher-ranking, conflicting constraint. The reader is referred to the growing body of literature on OT for additional background and exemplification within this particular theoretical framework, and particularly to McCarthy and Prince (1994, 1995) on Prosodic Morphology within OT.

1.4 Overview of the Dissertation

The next section presents an outline of the remainder of the dissertation.

Chapter 2 presents a summary of the consonantal and vocalic sound system of the language, focusing on the phonological weight contrast between the full vowels /i, u, a/ and schwa. Chapter 2 outlines the tenets of the Nuclear Moraic model of Shaw (1993, 1995, 1996a,b,c). In accordance with this theoretical model, I hypothesize here that schwa in Sliammon is both non-moraic and featureless (cf. Blake 1992, Kinkade 1992, Shaw 1993 et seq.). In addition, this chapter establishes that the realization of Full Vowel Reduction (laxing) in unstressed syllables in Sliammon is distinct from the surface realization of schwa.

Chapter 3 provides an analysis of the prosodic structure of the language with emphasis on the distribution of schwa. §3.1 motivates the moraic structure of coda consonants in the language, §3.2 provides a description of some of the basic issues regarding syllabification, emphasizing the interaction between syllable structure constraints and the morphology. §3.3 provides a preliminary introduction to metrical structure in the language, highlighting the fact that primary stress in Sliammon, unlike many other Salish languages in the family, is fixed on the stem-initial vowel regardless of its inherent weight.

Chapter 4 begins with a basic typology of the different "kinds" of schwa which are found in Sliammon as evidenced by their phonological behaviour: (i) excrescent schwa, (ii) epenthetic schwa and (iii) non-alternating schwas, which are subsumed under (ii). Schwa is proposed to be non-lexical (i.e. not present in the Input), and epenthesis is driven by the constraint Proper Headedness which requires that the Foot contains a syllable which is headed by a Nucleus (specifically, a vowel). §4.3 provides evidence that Full Vowel Reduction (laxing) involves the loss of phonological weight, expressed in terms of moras. The output of Full Vowel reduction is distinct from the realization of schwa in terms of its featural representation, but is claimed here to have the same prosodic representation as schwa. This section provides independent data on Full Vowel Reduction which confirms the hypothesis made in Blake (1999).

Although schwa epenthesis is driven by the constraints on Proper Headedness, there is also evidence that the language has a number of strategies which conspire to avoid schwa in a stressed open syllable (*ə́]σ). Chapter 5 brings together different cases of surface allomorphy, and shows that they receive a unified explanation with reference to the constraint *ə́]σ.

Chapter 6 addresses further implications for the analysis developed in the context of this dissertation. §6.1 documents and analyzes the variant forms of the possessive -hV suffix in Sliammon, along with its variant sites of affixation (sometimes a suffix, sometimes an infix). §6.2 makes important claims regarding the status and form of prefixes, interacting with pervasive constraints on the morpho-syntactic structure of the language. The effect of these general constraints on two prefixes in particular is discussed. One is the s-nominalizer, broadly attested across other languages in the Salish family, but conspicuously absent in Sliammon. The second is a plural prefix/infix, here hypothesized to be /L'-/, cognate with the plural l-infix of Musqueam and Saanich. The existence of this prefix has not been previously recognized by others working with Sliammon, undoubtedly due to its highly variant realization, viz. [-iʔ ~ -uʔ ~ -aʔ]. What is shown here is that these variants follow directly from the convergence of hypotheses related to the realization of sonorant /L'/, combined with constraints on prefixation. A crucial observation related to both these underlying prefixes is that both, being strictly "consonantal", would violate a pervasive constraint against initial complex clusters if they were simply prefixed, i.e. *s-C..., *L'-C... Significantly, ə-epenthesis is not an available strategy to rescue either of these cases. The thesis concludes, therefore, with a discussion of how the operative higher order constraints here interact with the constraints governing the realization of schwa which have been motivated in previous chapters.

Chapter 2: Introduction to Sliammon Sound System

How wonderful is the human voice! It is indeed the organ of the soul! ....The soul of man is audible, not visible. A sound alone betrays the flowing of the eternal fountain, invisible to man!

Henry David Longfellow

2.0 Introduction

The goal of this chapter is to present a detailed overview of the sound system of Sliammon, presenting first the consonant contrasts and then focusing on the vowel inventory.

2.1 Sliammon Sound System

Sliammon, like other Salish languages, has a large consonantal inventory (43 consonants). The contrasts indicated here are based on minimal and near-minimal pairs presented in Appendix IV, and are largely in agreement with work of J.Davis (1970), Blake (1992) and Watanabe (1994a, 2000). The proposed phonemic inventory of the language is presented in (1):

(1) Sliammon Phonemic Inventory (cf. J.Davis 1970, Kroeber 1989, Blake 1992, Watanabe 1994)

Place / Manner	Labial	Dental Interdental	Alveolar	Lateral	Alveo-Palatal Palatals	Velar	Uvular	Laryngeal
Stops plain ejectives	p p̓	t$^{\theta}$ t̓$^{\theta}$	t t̓	ƛ ƛ̓	č č̓	k k^w k̓ k̓^{w}	q q^w q̓ q̓^{w}	ʔ
Fricatives		θ	s	ɬ	š	x^w	x̌ x̌^{w}	h
Non-continuant Resonants					ǰ ǰ̓	g g̓		
Resonants plain glottalized	m m̓		n n̓	l l̓	y L y̓ L'	w w̓		
Vowels					i	u [ə] a		

Each symbol in (1) is an abbreviation for a set of phonological features which will be discussed in more detail in §2.3.2.1.

2.2 Consonant System

2.2.1 The Inventory

There are 19 Stops (13 stops, 6 affricates) plain and glottalized pairs at seven different places of articulation: Labial, Dental, Alveolar, Alveo-palatal, Velar, Uvular and Laryngeal: /p, p̓, t^{θ}, t̓$^{\theta}$, t, t̓, ƛ, ƛ̓, č, č̓, k, k̓, k^{w}, k̓^{w}, q, q̓, q^{w}, q̓^{w}, ʔ/. Affricates are analyzed here as a species of stop since they clearly pattern with the class of [-continuant]s, and are distinguished by their release features, following Jakobson, Fant and Halle (1952), Czaykowska-Higgins (1988), Shaw (1991), and LaCharité (1993).

The fricatives in Sliammon are /θ, s, ɬ, š, x^{w}, x̌, x̌^{w}, h/ and are exemplified in Appendix IV. There is no labial or labio-dental fricative in Sliammon, nor is there a velar fricative /x/ (except as an infrequently occurring variant of /š/).

The symbols /ǰ, ǰ̓, g, g̓/ are used to represent the set of features which display Obstruent/Glide/Vowel alternations. In Blake (1992), I used the archi-phonemes /Y,Y', W, W'/, distinct from /y, y̓, w, w̓/, to represent the segments which alternate (/ǰ/ [ǰ ~ č ~ y ~ i ~ e]; /g/ [g ~ k ~ x^{w} ~ w ~ u ~ o]) along with their glottalized counterparts; the use of capitalized glide symbols was to emphasize the Resonant behaviour of these sounds. In the present work, the symbols /ǰ, ǰ̓, g, g̓/ are adopted for ease of comparison with other research on Sliammon such as Davis (1970), Kroeber (1989, 1991/1999), Watanabe (1994, 2000). However, the arguments regarding resonant status of /ǰ, ǰ̓, g, g̓/ and their proposed featural representation is basically the same as those in Blake (1992).

In addition to /ǰ, ǰ̓, g, g̓/, the class of resonants includes /m, m̓, n, n̓, l, l̓, y, y̓, L, L', w, w̓/. The archi-phonemes /L, L'/ are used to indicate a set of features which show a range of morpho-phonemic alternations /L/ [w ~ y ~ ɬ] and /L'/ [w̓ ~ y̓ ~ aʔ ~ ʔa ~ ɬ] to be discussed in §2.2.5.

This traditional way of presenting the consonant inventory is supplemented with extensive discussion of what these symbols represent - since each symbol is an abbreviation for a set of distinctive features. The consonant and vowel inventory will be discussed in terms of combinatorial specification §2.3, following Archangeli and Pulleyblank (1994).

Contrast the large consonantal inventory with the relatively small phonemic vowel inventory in (1): /i, u, a/ plus [ə]. Although there are a large number of surface vowels in the system, these surface variants arise from consonant-vowel (C-V or V-C) interaction (retraction, labialization, place assimilation) and vowel reduction. The surface realization of schwa is discussed in detail in §2.4.

2.2.2 Consonant Allophones I

The following consonantal allophones are not the focus of this study and are listed here so as not to give a false impression about the Sliammon language. It is beyond the scope of the current dissertation to discuss and document the full range of complexity which characterizes the consonantal sound system of the language. The following consonantal allophones are mentioned here and each one of them is identified as a topic which warrants for future research (i.e. systematic elicitation and acoustic studies). The goal of this section is to define limitations on range of consonantal phenomena to be discussed in the remainder of this thesis, while acknowledging the richness and range of complexity within the consonantal sound system. In general, these data include a level of phonetic detail which is not necessarily transcribed in the remainder of this thesis.

2.2.2.1 Stops and Affricates

2.2.2.1.1 Affrication of Stops

The uvular stops /q , q̓/ are often accompanied by a fricative release, indicated here by the raised [x̌] after the stop. These affricated stops are written phonetically as [qx̌] and [q̓x̌], and appear to be restricted to syllable onset position, as shown by the data in (2-3).

(2) /q/ → [qx̌]

	Input		Output	Gloss
a.	qaẁm	qáʔum	qx̌áʔom ~ qáʔwʊm	eye
b.	CəCPL-qaẁm	qə́wqaʔwəm	qx̌ə́wqx̌aʔwʊm ~ ó	eyes
c.	CəCPL-maqin	mə́qmaqən	mʌ́qʰmaqx̌ən	lots of hair
d.	p̓yqn	p̓íqən	p̓íəqx̌ən	shoulder
e.	CəCPL-p̓yqn	p̓ə́yp̓iqən	p̓íp̓iəqx̌ən	shoulders

(3) /q̓/ → [q̓x̌]

	Input		Output	Gloss
a.	q̓aykʷ	q̓áykʷ	q̓x̌ʌ́ykʷ ~ q̓ʌ́ykʷ	bald eagle
b.	CəCPL-q̓aykʷ	q̓ə́yq̓aykʷ	q̓ˣə́ʸq̓ˣaykʷʰ	*eagles*

In contrast /qʷ, q̓ʷ/ are rarely affricated, a fact which is also noted by J.Davis (1970: 40).

2.2.2.1.2 Aspiration

Stops (stops and affricates) are aspirated word-finally, as shown in (4) (cf. Davis 1970: 62)

(4) word-finally

	Input		Output	Gloss
a.	ʔǰ a čxʷ ʔut	ʔəʔǰa čxʷ ʔut	ʔáʔǰɛčxʷʔotʰ	*How are you (sg) ?*
b.	ʔǰ a čap ʔut	ʔəʔǰa čap ʔut	ʔáʔǰɛčɛpʔotʰ	*How are you (pl)?*
c.	ʔǰ čan ʔut	ʔiy čan ʔut	ʔíy čɛn ʔotʰ	*I'm fine*
d.	ʔwk̓ʷ št ʔut ʔǰ	ʔəwk̓ʷ št ʔut ʔəy̓	ʔú·k̓ʷšt ʔotʰ ʔíʔ	*We're all fine*
e.	ʔǰ-mut	ʔiʔmut	ʔí:mʊtʰ ~ ʔíymʊtʰ	*very good*

Word-internal syllable-final stops are also aspirated, as shown in (5) (cf. Blake 1992, 1995).

(5) syllable finally

	Input		Output	Gloss
a.	t̓$^{\theta}$ip̓-it-mut	t̓$^{\theta}$íp̓itmùt	t̓$^{\theta}$é^{ə} . p̓ɛt^{h} . mʊ̀t^{h} .	*very pointed*
b.	CəCPL-pq	pə́qpəq	pʌ́q^{h} . pʌq^{h} .	*all white*
c.	ʔatnupil	ʔátnupi̇̀l	ʔát^{h}. no . pɛ̀l .	*car, auto*
c'.	ʔatmupil	ʔátmupi̇̀l	ʔát^{h} . mo . pɛ̀l	*car, auto*
d.	ngapty	nə́gapti	nʌ́ . gʌp^{h} . ti .	*women*
e.	x̌^{w}up-x̌^{w}up	x̌^{w}up . x̌^{w}up .	x̌^{w}ɔ́p^{h} . x̌^{w}ɔp^{h} .	*hummingbird*

The examples in (6) show that aspiration may actually occur at a mora boundary[1].

(6)

	Input		Output	Gloss
a.	č̓t-t	č̓ətt	č̓ít^{h}t^{h}	*cut it*
a'.	č̓t-t čn sm	č̓ətt čən səm	č̓ít^{h}t^{h}čɩn səm	*I will cut it up*

It should also be noted that it is sometimes quite difficult to distinguish the full release of a stop in the environment before another stop versus the presence of aspiration in this context.

2.2.2.1.3 Palatal Off-glide on Palatals and Plain Velars

The alveopalatal and plain velar (DOR) consonants are often followed by an audible palatal off-glide, as shown by the data in (7-11).

[1]Bagemihl (1991: 635:fn 50) suggests that aspiration in Bella Coola may occur at a mora boundary: C→ [+sp gl]/__]μ.

(7) č → [čʸ] (note: [ł] represents a dark/retracted l and not a voiceless lateral fricative ɬ)

	Input		Output	Gloss
a.	čalas	čálas	čʸǽ^łʌs	*three*
b.	čalas-s	čálass	čʸέłʌs:	*Wednesday (three)*

(8) š → [šʸ]

	Input		Output	Gloss
a.	nš-m	nə́šəm	nɩ́šʸəm	*swim*

(9) k → [kʸ]

	Input		Output	Gloss
a.	kət̓=iqʷ=uǰ̓a	káʔt̓iqʷuʔǰa	kʸέʔt̓εqʷoʔǰεʰ	*pinky, small finger*
b.	CəCPL-kət̓=iqʷ=uǰ̓a	kə́t̓kaʔt̓iqʷuǰa	kʸə́t̓kʸεʔt̓εqʷoǰεʰ	*small fingers*

(10) k̓ → [k̓ʸ]

	Input		Output	Gloss
a.	hən̓k̓ala	hə́n̓k̓ala	hə́n̓k̓ʸεla	*pot for cooking*
b.	k̓ik̓ak̓	k̓ík̓ak̓	k̓ʸí·k̓ʸεk̓ʸ	*crow*
c.	č̓yk̓-ʔm=min	č̓əyk̓[a]ʔ[a]min	č̓í:k̓ʸεʔamɩn	*fry pan*
d.	t̓lk̓=iqʷ	t̓ə́lk̓iqʷ	t̓ʌ́łk̓ʸεqʷ	*nostril*
e.	CəCPL-t̓lk̓=iqʷ	t̓ə́lt̓əlk̓iqʷ	t̓ʌ́łt̓ʌłk̓ʸεqʷʰ	*nostrils*
f.	tik̓	tik̓	tik̓ʸ	*slim*

(11) g → [gʸ]

	Input		Output	Gloss
a.	tigəxʷ/tiguxʷ	tígəxʷ / tíguxʷ	tígʸʊxʷ	*nine*
b.	DIM-qagθ+[i]=uɬ	qáqəgiθuɬ	qáqəgʸiᵊθòɬ	*small potato*

This fact is documented by J.Davis (1970: 38, 67) and may be explained by the articulation of these consonants which are characterized as having a raised dorsum (DOR [hi]). The [^{y}] is therefore a release feature associated with a high consonant before the transition to a back non-high vowel.

2.2.2.1.4 Secondary Labialization

Consonants are pronounced with visible lip rounding before the rounded vowel /u/, which is indicated here by the raised [^{w}], as shown by the data in (12). This is a phonetic effect in these cases since there is no contrast between t̓$^{\theta}$ and t̓$^{\theta w}$ or between ƛ̓ and ƛ̓^{w}, for example.

(12)

	Input		Output	Gloss
a.	t̓$^{\theta}$ut̓$^{\theta}$uq̓^{w}	t̓$^{\theta}$út̓$^{\theta}$uq̓^{w}	t̓$^{\theta w}$ót̓$^{\theta w}$oq̓^{w}	*feather*
a'.	CaPL-t̓$^{\theta}$ut̓$^{\theta}$uq̓^{w}	t̓$^{\theta}$át̓$^{\theta}$ut̓$^{\theta}$uq̓^{w}	t̓$^{\theta}$át̓$^{\theta w}$ɔt̓$^{\theta w}$oq̓^{w}	*feathers*
b.	ƛ̓x̌^{w}=ay	ƛ̓ə́x̌^{w}ay	ƛ̓^{w}ɔ́x̌^{w}ʌy	*dog salmon*
b'.	CəCPL-ƛ̓əx̌^{w}ay	ƛ̓ə́x̌^{w}ƛ̓əx̌^{w}ay	ƛ̓^{w}ɔ́x̌^{w}ƛ̓^{w}ɔx̌^{w}ʌy	*dog salmon* (pl)
c.	CəCPL-ƛ̓aq^{w}=šn	ƛ̓ə́q^{w}ƛ̓aq^{w}šən	ƛ̓^{w}ɔ́q^{w}ƛ̓ʌq^{w}šɨn	*thighs*
d.	ƛ̓iʔ=uǰ̓a	ƛ̓úʔuʔǰa	ƛ̓^{w}óʔoʔǰɛ^{h}	*fast picker, fast hands*
d'.	CaPL-ƛ̓iʔ=uǰ̓a	ƛ̓áƛ̓əʔuʔǰa	ƛ̓áƛ̓^{ə}ʔoʔǰɛ	*lots of fast pickers*

The next examples show that labialization also results in a neutralization of contrast: /q , q^{w}/ merge in favour of [q^{w}] before the labio-velar vowel /u/ (=13.a). The related words in (13.a'-a") show that the Root /pq/ [pʌ́q] *white* is q-final.

(13)

	Input		Output	Gloss
a.	pq=uk^{w}t	pə́quk^{w}t	pʌ́q^{w}ok^{w}t^{h}	*white blanket, outfit*
a'.	pq	pəq	pʌ́q^{h}	*white*
a".	pq-pq	pəq-pəq	pʌ́q^{h}pʌq^{h}	*all white*

One minor and erratic phonetic effect (which will be mentioned here) includes the rounding effect that the consonant č has on a following vowel, as shown by the morphologically related examples in (14.a-c) versus (14.d).

(14) Lexical Suffix =čɪs/=čəs *hand*

	Input		Output	Gloss
a.	IMP-hiw=čis-ma	hi-hiw=čis-ma	héhəwčis^{y}ma^{h}	*paddling (one paddle)*
b.	t̓$^{\theta}$uʔ=čis	t̓$^{\theta}$uʔ=čis	t̓$^{\theta}$óʔčis	*seven*
c.	taʔa=čis	taʔa=čis	táʔačis	*eight*
but				
d.	θiya=čis	θəya=čis	θíɛčʊs ~ θíyɛčɪs	*five*[2]

2.2.2.2 Fricatives

2.2.2.2.1 Allophones of /θ/

The articulation of the interdental fricative /θ/ varies to some degree between [θ ~ s̺]. The symbol [s̺] is used to indicate an interdental s sound; a sound which is intermediate between θ and s. The variant [s̺] appears to occur before or after a back vowel u, a, ə and may simply be a slightly retracted articulation of /θ/ so that the transition from an anterior consonant to a back vowel (or vice versa) is made with less articulatory effort.

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2 Kroeber (p.c.) suggests that (14.d) may be /θiya=čs=us/ [θíɛčsʊs] meaning *five dollars*. This point requires further research.

(15) s in the environment of /a/

	Input		Output	Gloss
a.	kʷθays	kʷə́θays	kʷʊ́θʌys ~ kʷʊ́s̺ʌys	*island*
b.	θaʔn	θáʔən	θáʔən ~ s̺áʔən	*cohoe salmon (late run)*
c.	CəCPL-θaʔn	θáʔθaʔən	θáʔθaʔən ~ s̺áʔs̺aʔən	*lots of cohoe*
d.	θat̓ᶿm̓	θát̓ᶿəm̓	θát̓ᶿəm̓ ~ s̺át̓ᶿəm̓	*Spring salmon*
e.	CəCPL-θat̓ᶿm̓	θə́t̓ᶿθat̓ᶿəm̓	θɪ́t̓ᶿθat̓ᶿəm̓ ~ s̺ɪ́t̓ᶿs̺at̓ᶿəm̓	*Spring salmon* (pl)
f.	DIM-θat̓ᶿm[i]=uɬ	θáθat̓ᶿimùɬ	θáθat̓ᶿemʊɬ ~ s̺ás̺at̓ᶿemʊ̀ɬ	*small Spring salmon*
g.	qigaθ	qígaθ	qé·gʌθ ~ qé·gʌs̺	*deer*

(16) in the environment of /u/

	Input		Output	Gloss
a.	θumin	θúmən	θómən ~ s̺ómən	*eyebrow*
b.	CəCPL-θumin	θə́mθumən	s̺ə́ms̺omən	*eyebrows*
c.	θuθin	θúθin ~ ən	θóθɪn	*lips*
d.	CəCPL-θuθin	θə́θθuθin	s̺ɪ́s̺s̺oθɪn	*lots of lips*

In the data in (17), /θ/ is recorded systematically as [θ].

(17)

	Input		Output	Gloss
a.	θy̓θa	θiʔθa	θíʔθʌ	*that one* (fem)
b.	θiy=umixʷ=tn	θiyumixʷtn	θéyomɪxʷtn̩	*floor*
c.	qʷup=uθin	qʷupuθin	qʷópɔθen ~ qʷó:pòθɛn	*beard*
d.	IMP-maθiw+[ʔ]	mamaθiw̓	mámaθew̓	*to limp (limping)*
e.	θiq=nač	θiqnač	θɛ́qnʌčʰ	*dig roots*

The situation is also complicated by the fact that the Island Comox language is reported to have had [s] where the Mainland dialects (Homalco, Klahoose and Sliammon) use [θ] (cf. Harris (1981) on Island Comox). The interdental fricative may actually have a grooved articulation which makes it sound much closer to [s] - this phenomena is surely the source of some misrecordings where s is written instead of θ.

2.2.2.2.2 Variants of /š/ [š ~ x^{y}]

Historically, Proto-Salish (PS) *x fronted to š in Sliammon (cf. Thompson (1979a), Kuipers (1981, 1982), Galloway (1988), Kinkade (class notes), and Kroeber (1999:6-10) for a summary of the phonological sound correspondences). One elder spontanteously produced [x^{y}] as a variant of /š/, as shown by the following examples. The forms in (18) are cited from a single speaker.

(18)

	Input	Output	Gloss
a.	x^{w}əl̓uwla=xn	x^{w}áʔlowlàx^{y}ɩn	*spiked heels, high heels*
a'.	xəluwla=šn	x^{y}ìlowlášɩn	*spiked heels*
b.	ʔimax-iǰ̓a / ʔimax-iǰa	ʔɛ́max^{y}ìʔǰɛ ~ ʔɛ́max^{y}ìǰa	*ant* (lit: *fast walker*)
b'.	ʔimaš	ʔɛ́mʌš	*walk*

The examples in (18.a-b) are apparently old words judging from the comments of the elder, who learned these words from her father. These isolated examples may reflect the final stages of the historical sound shift since the Lexical Suffix (LS) =šən *foot, lower leg* is most often pronounced as [=šən ~ =šɩn] by other consultants, but is pronounced as [=x^{y}ən] in these limited set of examples. Sapir (1915:30) records [x^{y}] for *ant*, and J. Davis (1970) also documents a small number of instances of [x^{y}]. Watanabe (p.c.) also records [x^{y}íx^{y}it̓a·ɬšɩn] *tip-toeing, walking on one's toes.*

2.2.2.2.3 Allophones of xʷ

Davis (1970: 37) states that /xʷ/ is pronounced as [xʷ] intervocalically, and is often reduced to a voiceless [w̥] elsewhere. I have transcribed [xʷ] both intervocalically, and in word-initial pre-vocalic position (i.e. syllable Onset position). The reduction to [w̥] was also noted and documented in the context of the Sliammon/UBC Orthography Workshops (1996-1998), and is written here as a voiceless labio-velar glide: [w̥].

(19)

	Input		Output	Gloss
a.	saɬtxʷ	saɬtxʷ	sáɬtw̥	*woman*
b.	ǰanxʷ	ǰanxʷ	ǰɛ́nw̥	*fish, salmon* (generic)
c.	ƛ̓pxʷ	ƛ̓əpxʷ	ƛ̓ə́pw̥	*broke*
d.	ʔasxʷ	ʔasxʷ	ʔɑ́sw̥	*seal*
e.	tixʷθaɬ	tixʷθaɬ	tíxʷθaɬ ~ tíw̥θaɬ	*tongue*

Notice for example that the second person subject clitic čxʷ *you* (sg) is most often pronounced [čw̥]; however, since it is a frequently occurring morpheme, and [w̥] is an allophone of /xʷ/, it is written as čxʷ elsewhere in the dissertation and will generally be written that way in order to minimize differences in transcription, and facilitate comparative Salish research.

(20) Second Person Subject Clitic: čxʷ *you (sg)*

	Input		Output	Gloss
a.	IMP-tam čxʷ	tatam čxʷ	tátamčw̥	*What are you doing?*
b.	IMP-ǰƛ̓ a čxʷ	ǰə-yƛ̓ a čxʷ	ǰí:ƛ̓æčw̥	*Are you (sg) running?*
c.	p̓ap̓i-m čxʷ	p̓ap̓im čxʷ	p̓ɑ́p̓ɛmčw̥	*you're working*
d.	IMP-č̓ag-t čxʷ	č̓a-č̓ag-[a](t) čxʷ	č̓ɛ́č̓ɛgʌčw̥	*you're helping him/her*

The fact that /xʷ/ is often realized as a voiceless labio-velar glide [w̥] provides support for the existence of minor syllables in Sliammon (cf. §3.2.2.3.1). For example, /saɬtxʷ/ [sáɬtw̥] *woman* is syllabified as sáɬ . tw̥ and č̓a-č̓ag-a(t) čxʷ [č̓ɛ́č̓ɛgʌčw̥] *you're helping him/her* is syllabified as č̓ɛ́ . č̓ɛ . gʌ . čw̥ .

2.2.2.2.4 h ~ x̌ʷ in the environment of /u/

The fricative /h/ alternates with a surface [x̌ʷ] in the environment of /u/, as shown by the variants in (21).

(21)

	Input		Output	Gloss
a.	p̓uhu	p̓uhu	p̓ɔ́hɔ ~ p̓ɔ́x̌ʷo	*raven*
b.	nuh-m	nuhəm	nɔ́hɔm ~ nɔ́x̌ʷɔm	*feast, invite for feast*

2.2.2.3 Non-continuant Resonants /ǰ, ǰ̓, g, g̓/

2.2.2.3.1 Pre-nasalization

Prenasalization of /g/ [ᵑg] occurs phonetically in word-initial position (usually utterance/phrase initially in sentential contexts). Prenasalization is related to the timing of articulatory gestures; the onset of voicing occurs before the velum has completely sealed off the nasal cavity. The air which escapes through the nasal cavity produces the pre-nasalized obstruent: [ᵑg]. This is a phonetic effect which is variable, and has not been recorded for many lexical items. It will not be transcribed elsewhere in this thesis.

(22) [ᵑg]

	Input		Output	Gloss
a.	gɬ	gəɬ	ᵑgə́ɬ ~ gə́ɬ	*shiny*
b.	gə-g̓t̓	gə́wt̓	ᵑgə́ʔoʷt̓ ~ ᵑgʌ́ʔəwt̓	*oar*
b'.	CəCPL-gəgt̓	gə́wgəwt̓	gú·goʷt̓	*oars*
b".	DIM-gt̓	gígət̓	gígʌtʰ	*small oar*
c.	giǰa/ gǰa ? check	gíǰa	ᵑgíǰɛ	*soil, ground*
c'.	CəCPL-giǰa	gə́ygiǰa	ᵑgí:giǰɛʰ	*lots of soil*
d.	gʔt̓ᶿap	gáʔt̓ᶿəp	ᵑgá:t̓ᶿəp	*driving, steering*
d'.	CəCPL-gʔt̓ᶿap	gáʔgaʔt̓ᶿə̀p	ᵑgáʔgaʔt̓ᶿə̀pʰ	*driving around pl.*

Note that the corresponding pre-nasalized alveopalatal [ⁿʸǰ] has not been documented, so that there is an asymmetry between the realization of /ǰ/ and /g/, as observed in Blake (1992). Further, this pre-nasalization is not observed before the voiceless velar stops /k, k̓, kʷ, k̓ʷ/.

2.2.2.3.2. Retracted /g/

Davis (1970: 44-45) records the following words which contain a retracted variant of /g/, written here as [G] (note: the proposed Input forms are mine). He analyzes these examples as cases of free variation in which /g/ is assimilated in the environment of either a preceding or a following (non-adjacent) uvular consonant [q].

(23) Data cited from J.Davis (1970:44-45)

	Input	Output	Gloss
a.	gaqaθ	[GʌÌqaθ]	*married woman*[3]
b.	ga-gq[aq]aθ	[Gáwqaqaθ]	*married women*
c.	qax̌=igan	[qax̌éGɨn]	*tell lies*
d.	qaʔagin=aq=awtxʷ	[qa'aGɨna:qawtxʷ]	*bawdy house*

J.Davis also cites [č̓ɛ́ʔᵊGəy] *old time wooden spoon* but is unable to explain the retraction in this case. It is proposed here that this comes from /č̓ag=ʔay/ (help=tree) "wooden-helper" and that /g/ [G] is retracted in the environment of the following glottal (cf. §2.4 which shows that ʔ patterns with the post-velars in the retraction of the full vowels). It is proposed here that /g/ is retracted in the environment of any post-velar (PHAR) consonant, this class including /q, q̓, qʷ, q̓ʷ, x̌, x̌ʷ, h, ʔ/ (cf. §2.3 on phonological features). Additional examples were recorded in the context of the present research:

(24)

a.	mga	məga	[mʌ́Gʌ]	*cougar*

[3] The current most well-accepted translation of gáqaθ is *husband* ; gáwqasəm means *playing house; living together.*

2.2.2.4 Resonants

2.2.2.4.1 Nasals ~ voiced stops

Davis (1970: 34) notes that the nasals /m, n/ are sometimes strengthened to [b, d] in word-final position. These are clearly allophones of /m/ and /n/. This was also noted for the following lexical items from the most elderly consultants, but does not appear to be present in the pronunciation of younger speakers. Sapir (1915) makes the same observation for Island Comox.

(25) [m] ~ [b]

Input		Output	Gloss
a. ǰaq̓ʷ-m	ǰáq̓ʷ-əm	ǰɛ́q̓ʷʌm ~ ǰɛ́q̓ʷʌb	*sweat, perspire*

(26) [n] ~ [d]

Input		Output	Gloss
a. čtuxʷan	čətuxʷan	čítuxʷʌn ~ čítuxʷʌd	*wild blackberry*

2.2.2.4.2 Glottalized resonants

There is some variation in the surface realization of glottalized resonants in word-final position, as shown by the data in (27) and discussed in greater detail in Chapter 5.

(27)

Input		Output	Gloss
a. čuǰ̓	čúẏ	čúẏ ~ čúyʔ	*child, baby*
b. tam ga tan̓	tám ga tán̓	tám gʌ tʌ́n̓ ~ tʌ́nʔ	*what's that?*
c. DIM-x̣̌ax̌ay+[ʔ]	x̣̌áx̣̌x̌aẏ	x̣̌áx̣̌x̌ʌẏ ~ x̣̌áx̣̌x̌ʌyʔ	*old*
d. IMP-q̓ʷΘ-m+[ʔ]	q̓ʷə-q̓ʷΘ-əm̓	q̓ʷáq̓ʷΘəm̓	*telling a story*
e. təm̓	təm̓	tʌm̓ ~ tʌmʔ	*belt, to tie*

2.2.2.4.3 Retracted Coronals

The next section documents retraction of the coronal consonants /s/ and /l/.

/s/ is retracted to [ṣ] in a number of contexts:

(28)

	Input		Output	Gloss
a.	muʔus	muʔus	mɔ́ʔoṣ	*head*
a'.	CəCPL-muʔus	məʔ-muʔus	má·mɔ̀ʔoṣ	*heads*

The resonant /l/ is often pronounced with a back articulation [ɫ]. [Note the symbol ɬ is used for a voiceless lateral fricative; ɫ for a velarized liquid].

(29)

	Input		Output	Gloss
a.	CəCPL-ləplaš	lə́pləplaš	ɫə́pɫəpɫaš	*planks* (< CJargon)

The data in (30) shows that retraction (PHAR) is spread throughout the word.

(30)

	Input		Output	Gloss
a.	q̓ʷalas	q̓ʷalas	q̓ʷáɫʌs	*raccoon*
a'.	CəCPL-q̓ʷalas	q̓ʷəl-q̓ʷalas	q̓ʷʌ́ɫq̓ʷaɫʌs	*raccoons*

There are a small number of "retracted" Roots have been identified in Sliammon; however, this area of the phonology requires further research[4]. Consider the following retracted Root in Sliammon s̲ə̲l̲- (the retraction is indicated here by underlining the Root) which refers to *a circular motion*, as "you would turn a glass or the continual rotation of a Ferriswheel". In the surface form,

[4]Retraction has received quite a lot of attention in the discussion of Interior Salish languages (cf. van Eijk (1985/1997), Remnant (1990), Bessell (1992), Shahin (1995) on Lillooet (N.Interior Salish); Doak (1989), amongst others, and Czaykowska-Higgins/Kinkade (1998) for general discussion regarding retraction.

both the vowel [ə] and the coronal consonants [s, l] are noticably retracted: [sʌl]. The proposal made here is that this morpheme has a PHAR feature associated with it, as indicated by the presence of PHAR in the proposed Input.

(31) Sliammon Retracted Root səl-

	Input		Output	Gloss
a.	sl+PHAR-t čx^{w}	səl (t) čx^{w}	sʌ́lčx^{wh}	*you turn (it) around*
b.	IMP-sl+PHAR-m	sə-səl-əm	sə́sələm	*(its) turning*

The following Cowichan (Hul'qumi'num') cognates may help to explain the source of Retraction in this Sliammon Root. The Cowichan orthographic forms appear in angled brackets < > and are cited from Hukari and Peter (1995: 295). The Output forms have been transliterated based on the Guide to Pronunciation which appears in H&P (1995:340-341).

(32) Cowichan Cognates

	Orthographic Form		Output	Gloss
a.	<sul̓-ut>	səl̓-ət	səl̓ət	*spin wool*
b.	<sul̓-sul̓-tun>	səl̓-səl̓-tən	səl̓səl̓tən	*spinner, spindle whorl*

As shown by the data in (32), the Cowichan Root has a final glottalized l̓ - the glottalization may well be the source of Retraction in the Sliammon form. This tentative proposal seems to be supported by the observation that glottal stop and glottalized consonants in Sliammon have a lowering effect on adjacent vowels in the language, as will be discussed in §2.4.

2.2.3 Consonant Allophones II

The following issues require particular discussion since these consonantal processes occur pervasively in the language and the reader will need to keep track of these insertion, and deletion phenomena.

2.2.3.1 Issue of Labialization

2.2.3.1.1 C^{o} vs C^{w}

Davis (1970:27-28) notes that the labialized consonants are not perceived as rounded in the environment of a tense rounded vowel. He cites Sapir (1915) on Island Comox, and Newman (1969) on Bella Coola, both of whom make the same observation. Davis represents the rounded series as /C^{o}/ at the phonemic level which is used to indicate visible labialization without an audible off-glide. He differentiates [C^{o}] from [C^{w}] on the surface, and inserts the off-glide [^{w}] by phonological rule (viz. /^{o}/ → [^{w}]/__ non-round vowel). The data in (33) illustrate this convention.

(33)

	Input		Output	Gloss
a.	k^{o}išk^{o}iš	k^{w}išk^{w}iš	k^{w}íšk^{w}iš	*Stellar's jay*
a'.	CVC$_{PL}$-k^{o}išk^{o}iš	k^{w}iš-k^{w}išk^{w}iš	k^{w}íšk^{w}išk^{w}iš	*Stellar's jays*
b.	q^{o}n̓=iq^{o}ɬa	q^{w}əʔniq^{w}ɬa	q^{w}áʔ^{a}nɛq^{w}ɬʌ	*knee*
b'.	CəC$_{PL}$-q^{o}n̓=iq^{o}ɬa	q^{w}ən-q^{w}əʔniq^{w}ɬa	q^{w}ə́nq^{w}aʔ^{a}nɛq^{w}ɬʌ	*knees*
but				
c.	k^{o}um̓t	k^{o}um̓t	k^{o}úm̓t^{h}	*kelp*
c'.	CVC$_{PL}$-k^{o}um̓t	k^{o}um-k^{o}um̓t	k^{o}úmk^{o}ùm̓t^{h}	*lots of kelp*

The distinction between [C^{o}] and [C^{w}] is not transcribed in the remainder of this thesis. A raised [^{w}] is used throughout to indicate lip rounding, and does not differentiate between lip rounding versus lip rounding with an audible off-glide. The audible off-glide is not perceived before a round vowel; however, related plural CəC- reduplicative forms confirm that the consonants are labialized, as shown by the data in (34).

(34)

a. Cʷ uC

a'. Cʷ əC-

2.2.3.1.2 Neutralization of contrast: C/Cʷ → Cʷ/u

It should also be noted that there is a surface neutralization of plain vs. rounded contrast in velars and uvulars in the environment of a tense rounded vowel, as shown by the gaps in the data in Appendix IV.

Evidence for /..Cu/ can be seen from the following plural and diminutive plural forms in (35-36). The surface form of the CəC- reduplicative prefix in (35.a) shows that the Root for *ling cod* is /t̓ᶿx̌u/ with a plain /x̌/ when the triggering context for labialization is absent. The /x̌/ is realized as [x̌ʷ] before the rounded vowel /u/. Similar disambiguating behaviour is seen in the other forms here.

(35)

	Input		Output	Gloss
a.	DIM-CəCPL-t̓ᶿx̌u+[ʔ]	t̓ᶿi-t̓ᶿəx̌-t̓ᶿəx̌uʔ	t̓ᶿít̓ᶿʌx̌t̓ᶿɔx̌ʷoʔᵒ	*lots of small cod*
a'.	t̓ᶿx̌u	t̓ᶿəx̌u	t̓ᶿɔ́x̌ʷo	*ling cod*
b.	CəCPL-p̓ux̌u=uɬ	p̓əx̌-p̓əx̌uɬ	p̓ʌ́x̌p̓ʌx̌ʷòɬ	*small ravens*
b'.	p̓ux̌u	p̓ux̌u	p̓óx̌ʷo	*raven* (cf. also p̓óho)

In contrast, the CəC reduplicative prefixes in (36.a'-b') show that these Roots contain a labialized consonant since labialization surfaces in contexts other than before a round vowel, as in x̌ʷəs-x̌ʷusəm for example.

(36)

	Input		Output	Gloss
a.	x̌ʷus-m	x̌ʷus-əm	x̌ʷósɔm	*I. ice cream, soapberry*
a'.	CəCp$_L$-x̌ʷus-m	x̌ʷəs-x̌ʷus-əm	x̌ʷʌ́sx̌ʷosɔm	*lots of soapberries*
b.	pukʷ	pukʷ	púkʷ	*book*
b'.	DIM-CəCp$_L$-pukʷ	pi-pəkʷ-pukʷ	pé·pʊkʷpùkʷ	*lots of little books*

2.2.3.2 Glottalization and Phonology of Laryngeals

2.2.3.2.1 Allophones of glottal stop /ʔ/

One of the most difficult questions regarding the consonantal inventory of Sliammon is what is the status of ʔ and h. Are these consonants a stop and fricative respectively, or are they both resonants, or is one an obstruent and the other a resonant? Davis (1970: 35) classifies /ʔ, h/ as sonorants, whereas Blake (1992) classifies /ʔ/ as a glottal stop, and /h/ as a fricative. In the case of /ʔ/ there is conflicting evidence. In word-final position, a glottal abruptly stops the air flow and cuts off the preceding vowel, as in the pronunciation of the words in (37).

(37) Word-finally

	Input		Output	Gloss
a.	DIM-čiya+[ʔ]	či-čyaʔ	číčᵊyɛ̀ʔ ~ číčⁱyɛ̀ʔ	*grandmother* (Dim.)
a'.	čiya	čiya	číya ~ číyɛ	*grandmother*
b.	DIM-kʷupa+[ʔ]	kʷu-kʷpaʔ	kʷúkʷpaʔ	*grandfather* (Dim.)
b'.	kʷupa	kʷupa	kʷúpa	*grandfather*
c.	DIM-pču+[ʔ]	pi-pčuʔ	pípčuʔ	*small basket*
c'.	pču	pəču	píču ~ píču	*cedar root basket*
d.	DIM-nan+[ʔ]	ni-nan̉	nénʌn̉ ~ nénʌnʔ	*nickname* (Dim.)
d'.	nan	nan	nán	*name*

Word-final glottals (especially in stressed mono-syllables) are aspirated, providing evidence for their status as stops, as shown by the data in (38). Recall that stops and affricates are aspirated in syllable-final position as discussed in §2.2.2.1.2. Since these word-final glottals patterns with the stops in the language with respect to aspiration, it is proposed here that a full glottal stop [ʔ] is characterized by the features [-cont, PHAR, LAR[cgl]]. Aspiration therefore targets all [-cont] segments in the language.

(38)

	Input	Output	Gloss
a.	ʔwk̓ʷ št ʔut ʔy̓	ʔúk̓ʷšt ʔotʰ ʔíʔʰ	*we're all fine*
b.	ʔiʔ	ʔɛʔ ~ ʔɛʔʰ	*yes*
c.	tala a kʷəθ naʔ	tálaha kʷəθ náʔ ~ tálaha kʷəθ náʔʰ	*Have you got money?*
d.	k̓ʷš-t gy̓	k̓ʷíštʰ ᵊgíʔ ~ k̓ʷíštʰ ᵊgíʔʰ	*count it!*

This contrasts sharply with perception of some intervocalic glottals derived historically from resonants which typically lack complete closure characteristic of glottal stop. Preliminary spectographic data shows vowel formant structure, and creakiness characteristic of a glottal glide here hypothesized to be comprised of the features [SON, PHAR, LAR[cgl]]. The symbol ['] is used here to represent this creaky voice articulation, following J.Davis (1970).

(39)

	Input		Output	Gloss
a.	paL'	paʔa	pɑ́'ɑ ~ pɑ́ʔɑ	*one*
b.	saL'	saʔa	sɑ́'ɑ ~ sɑ́ʔɑ	*two*

This observation was documented by Davis (1970), and therefore provides independent confirmation of these facts (cf. J.Davis (1970: 24-27) regarding glottal constriction). Historically, these glottals in Sliammon come from resonants, as shown by the comparative Sliammon, Sechelt

(Central Coast Salish), and Thompson (Interior Salish) evidence in (40). The Sechelt data is cited from Beaumont (1985). The Thompson forms are cited from Thompson and Thompson (1992: 187); the Thompson vowel /e/ is realized as [ɛ ~ æ] cf. T&T (1994: 13-16) for allophones of /e/.

(40) Comparative data: Sliammon / Sechelt / Thompson

	Input		Output	Gloss
a.	paL’	pa’a	pɑ́’ɑ ~ pɑ́ʔɑ	*one* (Sl)
a'.	pala	pala	pála	*one* (Se)
a".	peyeʔ	peyeʔ	péyeʔ	*one* (Th)
b.	saL’	sa’a	sɑ́’ɑ ~ sɑ́ʔɑ	*two* (Sl)
b'.	seye	seye	séye	*two* (Th)

Not only are these glottals ['] related to resonants from a comparative perspective but within the synchronic grammar of Sliammon they show alternation with the resonants ẏ and ẇ, as shown by the morphologically related forms in (41).

(41) Sliammon ['/ ʔ ~ ẇ ~ ẏ]

	Input		Output	Gloss
a.	paL’	pa’a	pá’a ~ páʔa	*one*
a'.	saL’	sa’a	sá’a ~ sáʔa	*two*
b.	paL’=us	paẇus	páwʔus ~ páwʔʊs	*one round object*
b'.	saL’=us	saẇus	sáʔwʊs	*two dollars*
c.	pəL’-paL’	pəy-pa’a	pé:pa’a ~ pé:paʔa	*one person*
c'.	səL’-saL’	səy-sa’a	sɛ́:sa’a ~ sɛ́:saʔa	*two people*

2.2.3.2.2 Proposal

The proposal made here regarding the characterization of [ʔ/’] follows from the theoretical perspective adopted regarding the nature of phonological features. If features are linguistic primes, then what prevents combination of [PHAR, LAR[cgl]] with either of the features [-cont] or [son]? The feature [-cont] characterizes the stops and affricates in the language whereas the feature [son] characterizes the class of resonants in the language.

If the features [PHAR, LAR[cgl]] are combined with [-cont], this produces a glottal stop whereas collocation of the features [PHAR, LAR[cgl]] with [son] produces a glottal resonant or glide (cf. Combinatorial Specification of Archangeli and Pulleyblank (1994)). If Sliammon has both glottal stops [ʔ] and glottal glides ['] in its inventory, then what evidence is provided to the language learner to determine what kind of glottal is present in any particular form? There is at least some evidence based on morpho-phonemic alternation, as shown above, as well as by phonetic cues. In addition, a full glottal stop occurs word-initially (phrase-initially) and word-finally whereas the glide ['] tends to occur between sonorants, as in (42).

(42)

[ʔ] in onset position	[-cont PHAR LAR[cgl]]
[ʔ] in word-final position	[-cont PHAR LAR[cgl]]
['] in intervocalic position	[son PHAR LAR[cgl]]

The hypothesis that there are glottal glides in the language receives some support from the facts regarding Glide Vocalization.

2.2.3.2.3 Glide Vocalization

The data in (43-44) show glide/vowel alternations (y~i/e and w~u/o) which are analized here as glide vocalization.

(43) Glide Vocalization: y ~ i/e

	Input		Output	Gloss
a.	ɬay=nač=tn	ɬay=nač=tən	ɬáynačtən	*skirt*
a'.	DIM-ɬay=nač=tn+[ʔ]	ɬa-ɬy=nač=t[i]n̓	ɬáɬinàčtɪn̓	*small skirt*

b. saỷǰa	saỷǰa	sáʔyǰʌ	*leaf*
b'. DIM-saỷǰa+[ʔ]	sa-sỷǰaʔ	sási·ǰɛ̀ʔ^{ɛh}	*small leaf*
c. qayx̌	qayx̌	qáyx̌	*Mink, stage name*
c'. DIM-qayx̌=uɬ+[ʔ]	qa-qyx̌=uɬ	qáqex̌ʷʊ̀ɬ	*small (young) Mink*

(44) Glide Vocalization: w ~ u/o

Input		Output	Gloss
a. qagθ	qawθ	qáwθ	*potato*
a'. DIM-qagθ+[i]=uɬ(t)	qa-qag[i]θuɬ(t)	qáqʌgʸiᵊθòɬ(tʰ)	*small potato*
a". CəC$_{PL}$-qagθ=uɬ	qəw-qawθuɬ	qʷóqʌwθòɬ	*small potatoes*

As shown by the data above, the palatal glide y alternates with the [-back] vowel /i/ [i ~ e], whereas the labio-velar glide w alternates with the vowel /u/ [u ~ o]. Evidence from the form of the Active Intransitive suffix /-ʔm/ when it is followed by the Instrumental suffix /=min/ suggests that vocalization of ʔ does occur, surfacing as the corresponding PHAR vowel [a]. It is proposed here that the PHAR glide [son PHAR LAR[cgl]] alternates with the corresponding PHAR vowel in the language, as demonstrated by the following ʔ ~ a alternations.

The Active Intransitive /-ʔm/ surfaces as [ʔəm] in the following examples.

(45)

Input		Output	Gloss
a. t̓in-ʔm	t̓in-ʔəm	t̓ɛ́nʔəm	*barbecue (fish)*
b. sup-ʔm	sup-ʔəm	sópʔəm ~ sóp̓əm	*chop (wood)*[5]
c. ʔaθ-ʔm	ʔaθ-ʔəm	ʔáθʔʌm	*to give (s.t. at potlatch)*
d. p̓x̌̓-ʔm	p̓əx̌̓-ʔəm	p̓ʌ́x̌̓ʔəm	*pick (berries)*

[5]The word səpʔəm means *hit something*, and gát^{θ}akʷup is also used to mean *chop wood.*

When the Active Intransitive /-ʔm/ is followed by the Instrumental suffix =min, the identical instances of m-m are merged into a single [m], following Watanabe (2000). Notice that the glottal is both preceded and followed by a consonant, as shown by the forms in (46) Column 1.

(46)

	Input	ʔ-vocalization: [a]	Output	Gloss
a.	ɬič̓-ʔm=min	ɬič̓-amin	ɬí·č̓ɛmɛn	*comb*
b.	tg̓-ʔm=min	tuʔ-amin	túʔʌmɛn	*freezer*
b'.	tg̓	təw̓	təw̓ ~ túʔ	*ice*
c.	č̓t-q-ʔm=min	č̓ət-q-amin	č̓ítqamɛn	*knife*
c'.	č̓t-t-as	č̓ət-t-as	č̓ítʰtʌs	*he cut it*
d.	DIM-msiqʷ-ʔm=min	mi-msiqʷ-amin	mɛ́msɛqʷʌmɛn	*pins*
d'.	msiqʷ	məsiqʷ	mʌ́sɛqʷ	*purple sea urchin*
e.	ɬat̓-ʔm=min	ɬat̓-amin	ɬáʔt̓ʌmɛn	*herring rake*
e'.	ɬag̓at̓	ɬaʔgat̓	ɬáʔgətʰ	*herring*
e''.	DIM-ɬag̓at̓+[ʔ]	ɬa-ɬgat̓	ɬáɬᵊgətʰ	*small herring*

In the surface output form, the glottal [ʔ] does not surface - a reflex of the PHAR vowel surfaces instead [-ɛmɛn ~ ʌmɛn ~ amɛn], as shown by the data in (46.a-e) Columns 2 and 3. Conditions governing the realization of ɛ ~ ʌ ~ a based on influence of adjacent consonants are detailed in §2.4.

The proposal made here is that the PHAR glide ʔ vocalizes to [a], resulting in the observed surface output -amin. The implications of this proposal are far reaching but suggest that there is full symmetry in the relationship between Glide and Vowels in the language, as in (47).

(47) Glide Vocalization

DOR[hi, -bk]	y ~ i
LAB DOR	w ~ u
PHAR	ʔ ~ a

2.2.3.2.4 Glottalization

Sliammon also has independent processes of glottalization which accompany Diminutive and Imperfective reduplication, as illustrated by the data in (48-49). It will be shown in §5.2 that glottalized resonants are not permitted in syllable-initial (non-moraic) position in keeping with the generalizations in Blake (1992, 1995).

It is proposed here that glottalization which accompanies Diminutive reduplication targets the right-most moraic resonant within the stem domain, as shown by the data in (48). The floating glottal feature is represented here as [cgl] (constricted glottis) in Column 1.

(48) Diminutive

	Input		Output	Gloss
a.	q̓ʷat̓-m	q̓ʷat̓əm	q̓ʷát̓əm	*river*
a'.	DIM-q̓ʷat̓-m+[i]+[cgl]	q̓ʷa-q̓ʷt̓[i]m̓	q̓ʷáq̓ʷᵊt̓ɛm̓	*small river, creek*
b.	ɬay=nač=tn	ɬay=nač=tən	ɬáynačtən	*skirt*
b'.	DIM-ɬay=nač=tn+[i]+[cgl]	ɬa-ɬy=nač=t[i]n̓	ɬáɬinàčtɩn̓	*small skirt*
c.	yax̌ay	yax̌ay	yʌ́x̌ʌy	*clam basket*
c'.	DIM-yax̌ay+[cgl]	ya-yx̌ay̓	yɛ́yᵊx̌ʌy̓	*small clam basket*

The diminutive data in (37.a-c) above show that vowel-final stems also take a final glottal stop.

Glottalization which accompanies Imperfective reduplication targets the right-most moraic resonant (syllable-final) which is within the domain of Stem formation (cf. Appendix VII on the definition of morphological Stem, and Blake (in prep.) on Imperfective reduplication).

(49) Imperfective

	Input		Output	Gloss
a.	ʔiɬtan	ʔiɬtan	ʔɛ́ɬtʌn	*eat*
a'.	IMP-ʔiɬtan+[cgl] č	ʔi-ʔiɬtan̓ č	ʔɛ́ʔɛɬtʌ̀n̓čʰ	*I'm eating*
b.	tg=qin	təg=qin	túwqɛn ~ tʊ́wᵊqɛn	*to answer back*
b'.	IMP-tg=qin+[cgl]	tə-tg[a]=qin̓	tə́tᵊgaqɛ̀n̓	*answering back*
c.	hayɬ-m	hayɬəm	háyɬəm	*to flirt*
c'.	IMP-hayɬ-m+[cgl]	ha-hayɬəm̓	háhayɬʌm̓	*flirting*
d.	qʷas-Vm	qʷasam	qʷásʌm	*flower*
d'.	IMP-qʷas-Vm+[cgl]	qʷa-qʷasam̓	qʷáqʷasʌm̓	*blooming, flowering*
e.	ʔah-m č	ʔah-əm č	ʔáhʌmč	*I got hurt*
e'.	IMP-ʔah-m+[cgl] č	ʔa-ʔah-əm̓ č	ʔáʔahʌ̀m̓čʰ	*I'm getting hurt*

2.2.3.2.5 Deglottalization

The next section discusses deglottalization of a Root-final glottalized resonant in the environment before the Causative suffix /-stg/. Within Roots or Lexical Suffixes (LS), inherent glottalization associated with resonants is retained before another consonant, as shown by the data in (50-51).

(50) Root / LS

	Input		Output	Gloss
a.	nuw̓ɬ	núw̓ɬ	nów̓ɬ ~ nóʔwəɬ	*older brother, best friend*
b.	tᶿaj̓=tn	tᶿay̓=tən	tᶿáyiʔtən ~ tᶿáy̓ⁱtən	*umbrella*
c.	qʷɬ='ay=šn	qʷəɬay̓šən	qʷə́ɬ . ɬɛ̀y̓ . šɪn	*shoes*

The examples in (51.a-f) show the retention of glottalization on =aw̓txʷ, the Lexical Suffix for *house, dwelling, building.*

(51)

	Input	Output	Gloss
a.	tiwš-am=aw̓txʷ	tíwšɛmàw̓txʷ	*place of learning*
a'.	IMP-tiwš-am+[cgl]	títiw̓šɛ̀m̓	*learning*
b.	č̓ah-am=aw̓txʷ	č̓ɛ́hamàw̓txʷ	*church*
b'.	č̓ah-am	č̓ɛ́hʌm	*pray*
c.	ǰanxʷ=aw̓txʷ	ǰɛ́nxʷàw̓txʷ	*cannery*
c'.	ǰanxʷ	ǰɛ́nxʷ ~ ǰɛ́nw̥	*fish*
d.	k̓ʷuʔuxʷ=aw̓txʷ	k̓ʷúʔuxʷàw̓txʷ	*smoke house*
d'.	k̓ʷuʔuxʷ	k̓ʷúʔʊxʷ	*smoked fish*
e.	ʔax̌iθ=aw̓txʷ	ʔáx̌ɛθʌ̀w̓txʷ	*bedroom, hotelroom*
e'.	ʔax̌iθ	ʔáx̌ɛθ	*lay down*
f.	p̓akʷit=aw̓txʷ	p̓ákʷitàw̓txʷ	*floating house*
f'.	p̓akʷit	p̓á:kʷɪt	*raft*

When a Root which ends in a glottalized resonant is followed by a consonant-initial suffix, the glottalization associated with the resonant is lost (cf. ʔǰ̓ [ʔəy̓] *good*; -sxʷ form of causative suffix /-stg/), as in the examples in (52).

(52)

	Input		Output	Gloss
a.	ʔǰ̓-stg a čxʷ tə č̓əɬ	ʔəysxʷa čxʷ tə č̓əɬ	ʔíysxʷʌčxʷ tᵊ č̓íɬ	*Do you like the rain?*
a'.	ʔǰ̓-stg čan tə č̓əɬ	ʔəys(xʷ) čan tə č̓əɬ	ʔíys čín tᵊ č̓íɬ	*I like the rain*
b.	ʔǰ̓-stg a čxʷ tə ʔaxʷ	ʔəysxʷa čxʷ tə ʔaxʷ	ʔíysxʷʌčxʷ tᵊ ʔáxʷ	*Do you like the snow?*
b'.	ʔǰ̓-stg čan tə ʔaxʷ	ʔəys(xʷ) čán tə ʔaxʷ	ʔíys čín tᵊ ʔáxʷ	*I like the snow*

At this point it is not clear whether or not deglottalization is triggered by all consonant-initial suffixes or whether the causative suffix -stg has a special deglottalizing effect[6].

When a glottalized resonant is followed by a subject clitic rather than a suffix (čxʷ 'you sg.', št 'we') or particle (ga 'polite request, imperative'), deglottalization does not occur, as shown in (53). The subject clitic/particle in each case is underlined.

(53)

	Input		Output	Gloss
a.	čam šin̓ čxʷ	čam šin̓ čxʷ	čɛ́m šín̓ čxʷ	*Where are you going?*
a'.	IMP-čam šin̓ čxʷ	čáčam šin̓ čxʷ	čɛ́čɛm šin̓ čxʷ	*Where are you going?*
b.	čm̓ čxʷ ga	čəm̓ čxʷ ga	čím̓ čxʷ ga	*What's that matter?*
c.	čm̓ ga	čə́m̓ ga	čɩm̓ᵊgʌ ~ čɩm̓ᵊga	*Why?*

The proposal made here is that because the external argument (i.e. the subject pronoun) is introduced in the syntax (morpho-syntax), it is outside the domain of deglottalization. It is not within the same phonological domain as the Root/Stem which precedes it, and therefore the final glottalized resonant and following consonant are not adjacent to one another. Deglottalization does not occur between independent words either, as shown by the data in (54). The word qʷəl̓ *come* surfaces with a final [l̓] before qáʔmɛn.

(54)

	Input	Output	Gloss
a.	x̌ax̌̓ a kʷ θ qʷl̓ qʔ-m-an	x̌áx̌̓a kʷəθ qʷʌ́l̓ qáʔᵃmɛn	*Do you want to come with me?*
a'.	qʷl̓	qʷə́lʔ ~ qʷʌ́lʔ	*come*

[6]Watanabe (p.c.) proposes that this is an idiosynchratic property of the causative suffix. This is left for a topic for further research.

At this point, there is positive evidence for deglottalization before the causative morpheme. This area of the phonology is most complex (cf. also discussion in Watanabe (2000)), and requires further research (cf. Blake in prep).

2.2.3.2.6 Glottal Restructuring

Glottalized obstruents /O'/ are realized as [ʔO'] in the environment after a stressed schwa in order to prevent stressed schwa from occurring in a stressed open syllable (Blake (1995, 1999), Urbanczyk (1999), and §5.1). In the data below, the reader will also note the regular realization of schwa as lowered to [a] before a glottal.

(55)

	Input		Output	Gloss
a.	x̌t̓ᶿ-t	x̌əʔt̓ᶿ-t	x̌áʔ . t̓ᶿtʰ	*weigh it*
a'.	x̌t̓ᶿ-t	x̌əʔt̓ᶿ-[ə]t	x̌áʔ . t̓ᶿətʰ	*weigh it*
c.	x̌t̓ᶿ-t-'uł čn	x̌əʔt̓ᶿ-tuł čən	x̌áʔt̓ᶿ . toł . čɩn	*I weighed it*
d.	x̌t̓ᶿ-t-'uł a čxʷ	x̌əʔt̓ᶿ-tuł a čxʷ	x̌áʔt̓ᶿ . to . łæ̀ . čxʷ	*Did you weigh it?*

Chapter 5.1-5.2 provides detailed discussion of the surface realization of both glottalized obstruents and glottalized resonants.

The data in (56) shows that glottal insertion [ʔ] also marks a very limited number of diminutive forms.

(56)

	Input		Output	Gloss
a.	sałtxʷ	sałtxʷ	sáłtw̥ ~ sáłtxʷ	*woman*
a'.	sa[ʔ]łtxʷ	sáʔłtxʷ	sáʔᵃłtxʷ ~ sáʔłtxʷ	*little girl*
b.	wiwlus	wiwlus	wíwlos	*young man*
b'.	wiwlus+[cgl]	wiw̓lus	wέʔwᵊlos	*young man at puberty*

2.2.3.2.7 Floating feature: constricted glottis [cgl]

Consider the realization of the Past Tense marker /-[cgl]uɬ/ in (57-60). What we observe from a comparison of the morphologically related forms in (57) is that the past tense morpheme /-[cgl]uɬ/ (written as //-ʔuL// by Watanabe (2000: 306)) systematically causes glottalization of a preceding resonant, as in (57.a'-d') Column 2, but fails to affect a preceding fricative (58.a'-d') or stop (59).

Since glottalized resonants are not permitted in syllable-initial position, they are restructured as ʔR between vowels (cf. Blake 1992, 1995, 1999 and §5.2). If this restructuring cannot occur, then association of the floating [cgl] feature is blocked, given the high-ranking constraint which blocks glottalized resonants from Onset position (*R'/Onset). Examples of stem-final resonants which are not glottalized include: /x̌pǰ-[cgl]uɬ čan/ x̌ə́pǰuɬ čán [x̌ə́p^{ə}ǰʊɬ čɛ́n] *I turned back* (cf. /x̌pǰ/ x̌ə́pi *turn back*).

(57) preceding Resonant

	Input		Output	Gloss
a.	k^{w}n=igs-m	k^{w}aniwsəm	k^{w}ánewsʌm	*rest* (=igs *body*)
a'.	k^{w}n=igs-m-[cgl]uɬ a čx^{w}	k^{w}aniwsam̓uɬačx^{w}	k^{w}ánewsàʔmoɬæ̀čx^{w}	*Did you (sg) rest?*
b.	k^{w}tus-m ga	k^{w}ətusəm ga	k^{w}ʊ́tosəm^{ə}gʌ́	*turn around* (request)
b'.	k^{w}tus-m-[cgl]uɬ a čx^{w}	k^{w}ətusam̓uɬačx^{w}	k^{w}ʊ́tosàʔ^{ə}moɬæ̀čx^{wh}	*Did you turn around?*
c.	nš-m	nəšəm	nɪ́š^{y}əm	*swim*
c'.	IMP-nš-m-[cgl]uɬ čan	nən̓šəm̓uɬ čan	nɪ́n̓šæʔ^{ə}mòɬčɪn	*I was swimming*
d.	sp̓=iq^{w}an	səʔp̓iq^{w}an	sáʔp̓eq^{w}ʌn	*get hit on the head*
d'.	sp̓=iq^{w}an-[cgl]uɬ č	səʔp̓iq^{w}an̓uɬ č	sáʔp̓ɛq^{w}àʔ^{ə}noɬč^{h}	*I got hit on the head*

(58) preceding Fricative

	Input		Output	Gloss
a.	IMP-gay-t-as	gágayatas	gʌ́gayɛ̀·tʌs	*he's asking them*
a'.	gay-t-as-[cgl]uɬ	gáyatàsuɬ	gáyɛtàsoɬ	*he asked him*
b.	k^{w}ay-aš ga	k^{w}áyaš ga	k^{w}áyɩš^{ə}gʌ	*hide it* (request)
b'.	k^{w}ay-aš-as-[cgl]uɬ	k^{w}áyašàsuɬ	k^{w}áyɩšɛ̀soɬ	*he hid it*
c.	ɬč̓-t ga	ɬəč̓t ga	ɬíč̓t^{ə} ga	*cut it* (request)
c'.	ɬč̓-t-as-[cgl]uɬ	ɬə́č̓tasuɬ	ɬíč̓^{h}tasoɬ	*he (already) cut it*
d.	tk̓^{w}-t ga	tə́k̓^{w}t ga	tʊ́k̓^{w}t^{ə} gʌ	*pull it* (request)
d'.	IMP-tk̓^{w}-t-as-[cgl]uɬ	tə́tk̓^{w}atàsuɬ	tə́tk̓^{w}ətàsoɬ	*he was pulling it*

The [cgl] feature associated with the Past Tense morpheme does not typically glottalize a preceding stop, as shown by the data in (59).

(59) preceding Stop

	Input		Output	Gloss
a.	IMP-gay-t-as	gágayatas	gʌ́gayɛ̀·tʌs	*he's asking them*
a'.	gay-t-[cgl]uɬ č	gáyatùɬ č	gáyɛtòɬč^{h}	*I asked him*
b.	ǰtk^{w}-t	ǰə́tk^{w}at	ǰɩ́tk^{w}ʌt^{h}	*shake it*
b'.	ǰtk^{w}-t-[cgl]uɬ a čx^{w}	ǰə́tk^{w}àtuɬàčx^{w}	ǰɩ́tk^{w}àtoɬæ̀čx^{w}	*Did you shake it?*
c.	t̓$^{\theta}$k^{w}-t	t̓$^{\theta}$ək^{w}t	t̓$^{\theta}$ʊ́k^{w}t^{h}	*wipe it*
c'.	t̓$^{\theta}$k^{w}-t-[cgl]uɬ a čx^{w}	t̓$^{\theta}$ə́k^{w}tuɬàčx^{w}	t̓$^{\theta}$ʊ́k^{w}toɬæ̀čx^{w}	*Did you wipe it?*

The fact that glottalization is not always present in the Output suggests that it lacks segmental status, i.e. a root node. It behaves phonologically like a floating glottal feature since it requires an eligible host in order to be realized. The floating feature is represented here as [cgl], but is represented elsewhere in parentheses (ʔ) to indicate that it does not always have a surface manifestation (cf. Watanabe 2000, for example).

When the past morpheme occurs after a vowel-final object suffix, it is often realized as -h-uɬ, as in (60.a).

(60.a)

Input		Output	Gloss
a. k̓ʷn-θi-[cgl]uɬ č	k̓ʷə(n)θihuɬ č	k̓ʷʊ́θehoɬčʰ	*I looked at you*
b. p̓ap̓-ʔ[i]m-θi-[cgl]uɬ č	p̓ap̓ʔimθihuɬ č	p̓áp̓ʔɛmθehɔɬčʰ	*I fixed it for you (sg)*
b. p̓ap̓-ʔ[i]m-t-anapi-[cgl]uɬ č	p̓ap̓ʔimtanapihuɬč	p̓áp̓ʔɛmtànapèhoɬčʰ	*I fixed it for you* (pl)

I hypothesize that the intervocalic [h] is epenthetic - since it is the default consonant in intervocalic position (cf. §2.2.3.2.8 on h-epenthesis and §2.3.2.1.5 on the featural representation of /h/). Since the floating ʔ only targets a resonant (consonants specified as [son]), it is subject to deletion in this context as well[7].

2.2.3.2.8 Epenthetic Consonant [h]

The consonant [h] is epenthesized between a vowel-final Root and before a vowel-initial Lexical Suffix. The epenthetic laryngeal [h] appears in square brackets in each of the following examples. See §5.4 for further discussion of the resolution of vowel hiatus (V-V sequences) in Sliammon.

(61) h-epenthesis

Input		Output	Gloss
a. lamatu=ukʷt	lamatu[h]ukʷt	lámatu[h]ùkʷt	*sheep's wool, sweater*
a'. lamatu	lamatu	lámato	*sheep*

[7]Watanabe (p.c.) records two cases in which a vowel-final Root/LS takes -ʔuɬ rather than -h-uɬ: ʔuɬqʷu-ʔuɬ and not *ʔuɬqʷu-h-uɬ, and k̓ʷas=uǰa-ʔuɬ not *k̓ʷasuǰa-h-uɬ.

b. tala=awus=tn	tala[h]awustən	tála[h]àwustən	*eye glasses*
b'. tala	tala	tála ~ talʌ	*money*
c. kapi=aya	kapi[h]aya	kʸápi[h]àyɛ	*coffee pot*
c'. kapi	kapi	kʸápi ~ kɑ́pi	*coffee*
d. hm̓u=ay	həʔmu[h]ay	hɑ́ʔmo[h]ʌy	*cascara bark*
d'. hm̓u	həʔmu	hɑ́ʔmo	*pigeon*

2.2.4 Obstruent/Glide/Vowel Alternations

This section summarizes the Vowel/Glide/Obstruent alternations (/ǰ/ [ǰ ~ y ~ i/e ~ č], and /g/ [g ~ w ~ u/o ~ k ~ x^w]) in Sliammon. Although these alternations have been discussed by previous scholars including Sapir (1915), Davis (1970), Hagège (1981), Kroeber (1989), Blake (1992, 1995), and Watanabe (1994, 2000), there is no agreement as to whether the corresponding underlying "segments" are obstruents or resonants. In order to emphasize the resonant behaviour of these sounds, in Blake (1992) I used the archi-phonemes /Y, Y', W, W'/, distinct from /y, ẏ, w, ẇ/, as an abbreviation for the feature matrices for what in the present work are represented as /ǰ, ǰ̓, g, g̓/. I propose here that the lack of agreement /ǰ/Y/ or /g/W/ is symptomatic of phonological theories which treat "segments" as primitives (cf. Archangeli and Pulleyblank 1994). I claim that the sets of features which show these surface alternations in Sliammon are a set of conflicting features. Consider first the variant phonetic realizations of each of these sets of alternations given in (62-63).

Descriptively, [y] occurs either before another consonant, or at the end of a word. [ǰ] occurs in pre-vocalic position, and the phoneme /ǰ/ vocalizes to i ~ e (depending on the C-context) when it occupies the nucleus of a syllable. [č] is the surface realization when it occurs in a word-internal coda followed by [t]. In summary, this segment appears on the surface as [ǰ ~ č ~ y ~ i ~ e], neutralizing in the appropriate contexts with /y, č, i/.

(62) /ǰ/

	Input		Output	Gloss
a.	huǰ-it	[ǰ]	[hó·ǰit]	*ready*
b.	huǰ	[y]	[hóy]	*stop, finish*
c.	haǰ-haǰ-i-ɬ	[y, ǰ]	[háyhəǰ̓iɬ]	*everybody's flirting*
d.	haǰɬ-əm+[cgl]	[y]	[háyɬʌm̓]	*flirt*
e.	ʔǰ-ʔǰ=umiš	[i, ǰ]	[ʔíʔaǰumiš]	*very beautiful*
f.	tǰ-taǰ̓-aǰ̓=us	[č]	[tíč .taʔ. ǰeʔ.ǰɪs]	*cheeks*

The data in (63) shows that [w] occurs before another consonant, and that it alternates with [g] in prevocalic position . The phoneme /g/ vocalizes when it occupies the nucleus of a syllable, and it surfaces as [x^w] in word-final position. [k] is the surface realization of /g/ when it occurs in a word-internal coda position followed by a voiceless non-continuant. This appears to be in keeping with the generalization the obstruent clusters agree in voicing (lack of feature [sonorant]). The segment /g/ surfaces as [g ~ k ~ x^w ~ w ~ u ~ o], neutralizing in the appropriate contexts with underlying /k, x^w, w, u/.

(63)

	Input		Output	Gloss
a.	hig=us	[g]	hégus	*chief, rich in old way*
b.	DIM-CəC$_{PL}$-hig=us	[w]	hɛ́həwhègʊs	*small chiefs*
c.	mga	[g]	mʌ́g·ə	*cougar*
d.	məg-mga	[w]	mówmʌ́g·ə	*cougars*
e.	CəC$_{PL}$-ɬagt̓	[u,g]	ɬú:ɬagɪt̓	*herring* (pl)
f.	k̓^{w}n-ng	[x^w]	k̓^{w}ə́nəx^w	*see him/her*

Two points are crucial to understanding these segments. First, following Blake (1992) the Vowel/Glide/Obstruent alternations are governed by the prosodic organization of the syllable (cf. Blake (1992, 1995) and §3.2 on syllable structure in Sliammon).

(64)

[ǰ, g]	in syllable onset (non-moraic) position
[y, w]	in syllable coda (moraic) position
[i, u]	in syllable nucleus (Nucμ) position

Second, the defining features for each of the surface variants of /ǰ, g/ are given in (65). Their glottalized counterparts are identical, with the addition of LAR[cgl]. Their variant surface realizations result from the systematic non-realization of one (or, in the case of [xʷ], two) of their underlying features in a particular context. Namely: the feature [-cont] is not realized in moraic position (with the exception of č), and the feature [son] is lost in word-final position in the case of [xʷ]. The angled brackets are used here to indicate a feature which is not realized on the surface: <[f]>.

(65)	Distribution of f-elements for /ǰ/	Distribution of f-elements for /g/
	[ǰ] - [son, -cont, DOR hi, -bk]	[g] - [son, -cont, DOR hi]; <LAB[rd]>
	[i] - [son, DOR hi, -bk]; <[-cont]>	[u] - [son, DOR hi, LAB rd]; <[-cont]>
	[y] - [son, DOR hi, -bk]; <[-cont]>	[w] - [son, DOR hi, LAB rd]; <[-cont]>
	[č] - [-cont, DOR hi, -bk]; <[son]>	[xʷ] - [DOR hi, LAB rd]; <[son, -cont]>

In accordance with Optimality Theory (henceforth OT), the loss of features is driven by the interaction of conflicting constraints which ensure the creation of optimal prosodic constituents (Prince & Smolensky 1993, McCarthy & Prince 1994, Kirchner 1995, among others). In the case of the Sliammon data in question, a high ranking feature co-occurrence constraint drives the underparsing of lexically distinctive features. Align L ([-cont], σ) determines which features are underparsed, thus creating both optimal onset, and optimal coda constituents, as proposed in Blake (1995).

Evidence that /ǯ, g/ are specified as [son] is provided by the fact that they undergo glottalization, along with the other resonants /m, n, l, y, w/ in the system, as argued in Blake (1992, 1995). Alternations between [g ~ w ~ x^{w}] from /g/ provide evidence that the feature [son] is subject to deletion, and therefore provide evidence that [son] has autosegmental properties and is crucially not an "integral" part of the root node (contra McCarthy (1988), for example). This provides evidence for the position of the feature [sonorant] as a dependent of the Root node within the Feature Geometry which will be presented in §2.3.2.

2.2.5 Laterals /L, L'/

Following Blake (1992), the symbols /L, L'/ are used to represent sets of features which are realized as [y ~ w ~ ɬ] and [ẏ ~ ẇ ~ ɬ ~ ʔ] respectively. The distribution of each of these surface variants is dependent upon its position within the word, and on the quality of the adjacent vowel. The proposed status of /L, L'/ is motivated by the following morpho-phonemic alternations in (66-67), and by the fact that the independent phonemes /ɬ/, /l/ , /y/, /w/ do not undergo these alternations.

(66) /L/

	Input		Output	Gloss
a.	nx^{w}iL	nəx^{w}iɬ	nʊ́x^{w}ɩɬ	*dugout canoe*
b.	nx^{w}iL-s	nəx^{w}iy-s	nʊ́x^{w}ɩys	*his canoe*
b'.	nx^{w}iL-it	nəx^{w}iy-it	nʊ́x^{w}iyɩt^{h}	*their canoe*
b".	nx^{w}iL-ma	nəx^{w}iy-ma	nʊ́x^{w}ɩyma	*travel by canoe*
c.	t̓^{θ}amq^{w}L	t̓^{θ}amq^{w}ɬ	t̓^{θ}ámq^{w}ɬ	*cloud*
c'.	t̓^{θ}am-t̓^{θ}amq^{w}L-[i]m	t̓^{θ}am-t̓^{θ}amq^{w}[V]yim	t̓^{θ}ámt̓^{θ}àmq^{w}ɔ̀yɩm	*it's foggy*

(67) /L'/

	Input		Output	Gloss
a.	paL'/paL'a[8]	paʔa	páʔa	*one*
a'.	saL'/saL'a	saʔa	sáʔa	*two*
b.	paL'=agiɬ	paʔagiɬ	páʔagɪɬ	*one canoe*
b'.	saL'=agiɬ	saʔagiɬ	sáʔagɪɬ	*two canoes*
c.	paL'=us	paw̓us	páwʔus ~ páwʔʊs	*one round object*
c'.	saL'=us	saw̓us	sáw̓us check	*two dollars*
c".	DIM-saL'=us	sa-sw̓us	sásuʔʊs	*two sm. round objects*
d.	pəL'-paL'	pəy̓-paʔa	pé:paʔa	*one person*
d'.	səL'-saL'	səy̓-saʔa	sɛ́:saʔa	*two people*
e.	paL'=law̓i	pay̓=lawiʔ	páylàwɛʔ	*one bottle* (=law̓i *bottle*)
e'.	saL'=law̓i	say̓=lawiʔ	sáylàwɛʔ	*two bottles*

As observed from the data in (67), /L'/ becomes [ɬ] in word-final position. Word-internally it becomes [w̓] in the context of the round vowel /u/, [ʔ] when it occurs in a total PHAR context (i.e. between a's), and [y̓] elsewhere. Notice that in (67.e-e'), /L'/ becomes [y̓] before the coronal lateral /l/ even though it is preceded by the vowel [a]. This reinforces that fact that the glottal [ʔ] from /L'/ occurs in a total PHAR context. See also Appendix IV for further examples of the contrasts between /L, L'/ and /y, y̓ , w, w̓, ɬ/.

[8]Determining the underlying representation for the Roots *one* and *two* is somewhat problematic. These Roots often behave as though they are consonant-final. For example, they do not induce h-epenthesis with the addition of a vowel-initial LS; however, if the Roots are of the shape paL' and saL', then one might expect paɬ and saɬ when L' occurs in word-final position. This issue is not resolved here; it remains a topic for further research.

2.2.6 Geminate Consonants

The resonants [n, m, l, y, w] are lengthened intervocalically, as shown by the data in (68).

(68) Resonants

a. IMP-ɬx̌-m	ɬə-ɬx̌-əm	ɬə́ɬx̌ʌm	*leaking*
a'. IMP-ɬx̌-m a tΘ nxʷiL	ɬə-ɬx̌-əm a tΘ nəxʷiɬ	ɬə́ɬx̌əm:ɑ tᶿΘ nʊ́xʷ:ɩɬ	*Is yr. boat leaking?*

Obstruents are lengthened in intervocalic position after an initial stressed schwa, as in (69).

(69) Obstruents

Input		Output	Gloss
a. nxʷiL	nəxʷiɬ	nʊ́xʷ:ɩɬ	*dugout canoe*
a'. nxʷiL-ma	nəxʷiy-ma	nʊ́xʷ:i·mɑ̀ʔ	*travel by canoe*
b. t̓ᶿx̌u	t̓ᶿəx̌u	t̓ᶿɔ́x̌ʷ:o	*ling cod (fish)*
b'. DIM-t̓ᶿx̌u+[ʔ]	t̓ᶿi-t̓ᶿx̌uʔ	t̓ᶿɩ́t̓ᶿx̌ʷoʔᵒ	*small ling cod*

Gemination of intervocalic consonants after stressed schwa will be discussed in greater detail in §5.3.

2.2.7 Consonant Deletion

The following deletion processes also affect the surface realization of consonants.

2.2.7.1 Identical Consonants

Davis (1970: 42) documents the fact that identical consonants C_iC_i generally reduce to a single instance of that consonant (C_i). The data in (45-46) also show reduction of m-m to a single instance of m, as in /č̓t-a-ʔm=min/ č̓ətqamin [č̓ɩ́tqamɛn] *knife.*

A principled exception to this generalization is presented in (70) and involves Root-final -t followed by the -t of the Control Transitivizing suffix.

(70)

a. č̓ət-t-as	č̓ə́ttas	[č̓ɩ́tᵊtʌs ~ č̓ɩ́tʰ . tas]	*he cut it*

Notice that if consonant deletion were to occur in this context yielding [č̓ə́tʌs], it would have the effect of leaving schwa in a stressed open syllable. As will be argued in Chapter 5, stressed schwa in an open syllable is systematically avoided, if possible.

2.2.7.2 Coronal Deletion

Sliammon also has a number of consonant deletion processes which involve coronal consonants: t, n, ɬ deleting before other coronal consonants. Consonants which undergo deletion are parenthesized (C) in column 2.

2.2.7.2.1 t-deletion

The data in (71) shows that the t-transitivizer undergoes deletion in the environment before a following č.

(71) t-deletion

	Input	t-deletion	Output	Gloss
a.	gq̓ʷ-t ga	gəq̓ʷt gá[ʔ]	gə́q̓ʷt gáʔ ~ gɔ́q̓ʷt	*drag it (request)*
b.	gq̓ʷ-t-as	gəq̓ʷtəs	gə́q̓ʷtəs ~ gɔ́q̓ʷ. təs	*s/he drags it*
c.	gq̓ʷ-t čan	gəq̓ʷ(t) čan	gə́q̓ʷčɪn ~ gɔ́q̓ʷ. čɛn	*I'm dragging it*
d.	gq̓ʷ-t čaxʷ	gəq̓ʷ(t) čaxʷ	gɔ́q̓ʷ . čɛxʷ	*you drag it*

2.2.7.2.2 n-deletion

Nasal n-deletion is illustrated by comparing related forms of the LS =iqʷan *top of head, high point.* The LS is n-final, as shown in (72).

(72)

	Input		Output	Gloss
a.	tih=iqʷan	tihiqʷan	tíhɛqʷʌn	*big head*
b.	t̓ᶿip̓=iqʷan	t̓ᶿip̓iqʷan	t̓ᶿép̓eᵊqʷʌn	*pointed head*
c.	tt̓ᶿ-[i]m=iqʷan	təʔt̓ᶿimiqʷan	táʔt̓ᶿemèqʷʌn	*red head (red hair)*
d.	sp̓=iqʷan-ʔ[i]m=min	səʔp̓iqʷanʔimin	sáʔp̓eqʷʌnʔɛ̀mɪn	*fish club*

When the coronal resonant n precedes either a t or θ, it fails to surface, as shown by the morphologically related forms in (73) (see Watanabe (2000) for some lexical exceptions). Example (73.b) shows that deletion of /n/ before /θ/ results in compensatory lengthening of the preceding full vowel. As discussed in §3.1.1.1, compensatory lengthening occurs in stressed syllables and has not been documented in unstressed syllables.

(73)

	Input	n-deletion	Output	Gloss
a.	x̌im=iqʷan-t-m	x̌imiqʷa(n)təm	x̌ɛ́meqʷàtəm	*get clawed in the head*
b.	sp̓=iqʷan-θ-as	səʔp̓iqʷa(n)θas	sə́ʔp̓ɛqʷà:θʌs	*he hit me on the head*
c.	xʷulk̓ʷ-ay=iqʷan=tn	xʷulk̓ʷayiqʷa(n)tən	xʷúlk̓ʷàyɛqʷàtən	*hair ribbon*

2.2.7.2.3 ɬ-deletion

The example in.(74.a) shows that the past tense marker /-'uɬ/ is ɬ-final (cf. §2.2.3.2.7 on other realizations of the past tense marker). The data in (74.b) shows that ɬ deletes before -s. Both the past marker /-'uɬ/ and the third person possessive marker -s are within the affixal domain. Root-final ɬ is retained before an s-initial suffix, as in ƛ̓əɬ-sxʷ (Watanabe p.c.).

(74) ɬ-deletion

	Input	ɬ-deletion	Output	Gloss
a.	gay-t-[cgl]uɬ č		gáyɛtòɬč	*I asked him*
b.	mn̓a-ʔuɬ-s	məʔna-ʔu(ɬ)-s	mə́ʔᵊnaʔòs	*his/her child* (former)
b'.	mn̓a	məʔna	mə́ʔna	*one's offspring, child*

2.3 Theoretical Assumptions

2.3.1 Features

The next section provides a general introduction to the phonolgical features which identify natural classes of sounds which pattern together in the language. These features are listed in (75) and discussed in detail in the following sections.

(75) Features

Continuant [-cont]

Sonorant [son] (all resonants)

Consonant [-cons] (vowels and glides)

Laryngeal: constricted glottis [LAR[cgl]]

Labial (LAB) (primary place: labials)

Round [rd] (labialized consonants: labio-velar and labio-uvulars)

Coronal (COR) (interdentals, coronals, laterals)

Dorsal (DOR) (alveopalatals, palatals, plain velars, uvulars)

High [hi] (alveopalatals, palatals, velars)

Back [-back] (alveopalatals, palatals)

Low [lo] (low vowel /a/)

Pharyngeal (PHAR) (post-velars: uvulars and laryngeals)

Lateral (lat): ƛ, ƛ̓, ɬ, l, l̓, L, L'

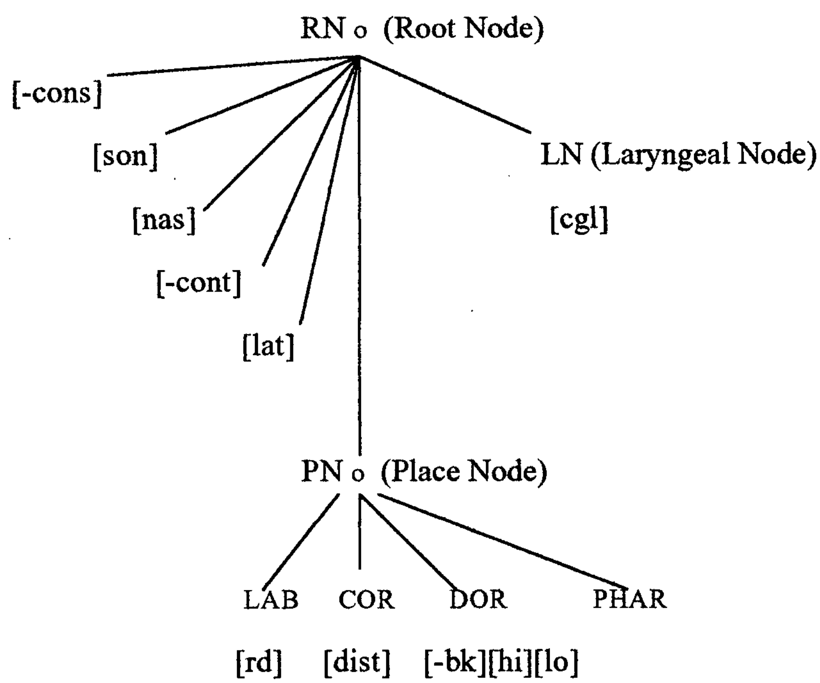
Nasal (nas)

Distributed (dist)

2.3.2 Feature Geometry

The phonological features in (75) are represented in the articulator-based Feature Geometry presented in (76), following earlier proposals that features are hierarchically ordered (cf. Sagey (1986), McCarthy (1988), Halle (1992), Archangeli and Pulleyblank (1994), amongst others). I have included only the part of the geometry which is relevant for characterizing the Sliammon data presented in this thesis. This is essentially the same model argued for in Blake (1992:8-9). The features as well as articulator nodes are privative - they are either present or absent from the representation.

(76) Feature Geometry



2.3.2.1 Representation of Sliammon Consonants

The following sections (§2.3.2.1.1-§2.3.2.1.5) provide the feature geometric representations which I am assuming for each of the consonants in the language (cf. also Blake (1992)). The representation of each of the consonants is central to an understanding of the consonant-vowel (C-V) interaction discussed in §2.4. The adjacent consonants also determine the surface realization of schwa which will be discussed in §2.4.4.

2.3.2.1.1 Labials

Labial consonants are specified as LAB and not as LAB[rd] since they do not seem to exert a rounding effect on a preceding schwa unlike velar and uvular consonants which have secondary labialization. The presence of the feature [rd] entails the existence of the Dorsal node ([rd] ⊃ DOR).

(77)

Geometry	p	p̓	m	m̓
RN	o	o	o	o
[son]			[son]	[son]
[nas]			[nas]	[nas]
[-cont]	[-cont]	[-cont]		
LN		o		o
[cgl]		[cgl]		[cgl]
PN	o	o	o	o
LAB	LAB	LAB	LAB	LAB

2.3.2.1.2 Coronals and Laterals

The class of coronals includes dentals and alveolars. The dental consonants t^{θ} and $t̓^{\theta}$ and the interdental fricative θ are distinguished from the other coronals in the system by the nature of their consonant release; they are overtly marked as [distributed], as in (78).

(78) Coronals

Geometry	t^{θ}	$t̓^{\theta}$	θ	t	t̓	s	n	n̓
RN	o	o	o	o	o	o	o	o
[son]							[son]	[son]
[nas]							[nas]	[nas]
[-cont]	[-cont]	[-cont]		[-cont]	[-cont]			
LN		o			o			o
[cgl]		[cgl]			[cgl]			[cgl]
PN	o	o	o	o	o	o	o	o
COR	COR	COR	COR	COR	COR	COR	COR	COR
[dist]	[dist]	[dist]	[dist]					

(79) Laterals

Geometry	ƛ	ƛ̓	ɬ	l	l̓	L	L’
RN	o	o	o	o	o	o	o
[son]				[son]	[son]	[son]	[son]
[-cont]	[-cont]	[-cont]					
[lat]	[lat]	[lat]	[lat]	[lat]	[lat]	[lat]	[lat]
LN		o			o		o
[cgl]		[cgl]			[cgl]		[cgl]
PN	o	o	o	o	o	o	o
COR	COR	COR	COR	COR	COR	COR	COR
DOR						DOR	DOR
[hi]						[hi]	[hi]

2.3.2.1.3 Alveopalatals

The alveopalatals in (80) are marked as DOR[hi, -bk] following Blake (1992). Motivation for their DOR[hi, -bk] specification rather than a featural representation such as COR DOR[hi] comes from the fact that alveopalatals front /a/ to [ɛ] (see discussion of V-features, §2.4), whereas the class of coronal consonants do not. Alveopalatals are specified as [hi] since they affect the height of the non-low vowel /i/ or /u/.

(80)

Geometry	č	č̓	š	ǰ	ǰ̓	y	y̓
RN	o	o	o	o	o	o	o
[son]				[son]	[son]	[son]	[son]
[-cont]	[-cont]	[-cont]		[-cont]	[-cont]		
[lat]							
LN		o			o		o
[cgl]		[cgl]			[cgl]		[cgl]
PN	o	o	o	o	o	o	o
DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR
[hi]	[hi]	[hi]	[hi]	[hi]	[hi]	[hi]	[hi]
[-bk]	[-bk]	[-bk]	[-bk]	[-bk]	[-bk]	[-bk]	[-bk]

2.3.2.1.4 Velars

Both the plain velars and the labio-velars determine the height of adjacent vowels, as will be discussed in §2.4.3-§2.4.4. These consonants are therefore marked as DOR[hi].

(81)

Geometry	**k**	**k̓**	**kʷ**	**k̓ʷ**	**xʷ**	**g**	**g̓**	**w**	**w̓**
RN	o	o	o	o	o	o	o	o	o
[son]						[son]	[son]	[son]	[son]
[-cont]	[-cont]	[-cont]	[-cont]	[-cont]		[-cont]	[-cont]		
LN		o		o			o		o
[cgl]		[cgl]		[cgl]			[cgl]		[cgl]
PN	o	o	o	o	o	o	o	o	o
LAB			LAB	LAB	LAB	LAB	LAB	LAB	LAB
[rd]			[rd]	[rd]	[rd]	[rd]	[rd]	[rd]	[rd]
DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR
[hi]	[hi]	[hi]	[hi]	[hi]	[hi]	[hi]	[hi]	[hi]	[hi]

2.3.2.1.5 Post-Velars: Uvulars and Laryngeals

The uvulars and laryngeals are represented as in (82). Uvulars are characterized here as complex DOR PHAR whereas laryngeals are specified as PHAR, following Cole (1987), McCarthy (1991), Shaw (1991), amongst others.

(82) Uvulars and Laryngeals

Geometry	q	q̓	x̌	qʷ	q̓ʷ	x̌ʷ	ʔ	h
RN	o	o	o	o	o	o	o	o
[son]								
[-cont]	[-cont]	[-cont]		[-cont]	[-cont]		[-cont]	
LN		o			o		o	
[cgl]		[cgl]			[cgl]		[cgl]	
PN	o	o	o	o	o	o	o	o
LAB				LAB	LAB	LAB		
[rd]				[rd]	[rd]	[rd]		
DOR	DOR	DOR	DOR	DOR	DOR	DOR		
PHAR	PHAR	PHAR	PHAR	PHAR	PHAR	PHAR	PHAR	PHAR

There is some difficulty in determining the appropriate representation of [h] in Sliammon. Schwa colouration before the consonants ʔ and h is not perfectly symmetrical. Schwa systematically lowers to [ɑ́] before the glottal [ʔ], as shown by the data in (83.a-e) and discussed by Kroeber (1989). The diminutive examples in (83.c'-e') are provided in order to provide morphological evidence for the weak roots (CC) posited in (83.c-e).

(83)

	Input		**Output**	**Gloss**
a.	mʔ-t	məʔt	mɑ́ʔtʰ	*get s.t.*
b.	sp̓=iqʷan	səʔp̓iqʷan	sɑ́ʔp̓eqʷʌn	*get hit on the head*
c.	ƛ̓ʔɬum̓	ƛ̓əʔɬum̓	ƛ̓ɑ́ʔᵊɬom̓	*wolf*
c'.	DIM-ƛ̓ʔɬum̓=uɬ	ƛ̓i-ƛ̓əʔɬumuɬ	ƛ̓ɪ́ƛ̓ɑʔɬòmʊɬ	*young wolf, wolf cub*
d.	mq̓ʷt̓ᶿ	məʔq̓ʷt̓ᶿ	mɑ́ʔqʷt̓ᶿ	*onion, wild onion*
d'.	DIM-mq̓ʷt̓ᶿ+[i]	mi-m̓əʔq̓ʷ[i]t̓ᶿ	mɛ́ʔmɑʔqʷɛt̓ᶿ	*small onion*
e.	kʷn̓ay	kʷəʔnay	kʷɑ́ʔᵊnʌy	*cover, lid*
e'.	DIM-kʷn̓ay+[ʔ]	kʷi-kʷnay̓	kʷɪ̀kʷnʌy̓ ~ kʷɪ́kʷnʌy̓	*small lid*

Notice, however, that schwa varies between [ʌ́ ~ ɑ́] before h, as shown in (84). This type of variation is not recorded before [ʔ].

(84) schwa before h

	Input		Output	Gloss
a.	qh-t	qəht	qʌ́ht ~ qɑ́ht	*lift s.t.*
a'.	qh-t-'uɬ čan	qəhtuɬ čan	qʌ́htoɬ čɛ́n	*I lifted it up*
a".	qh-t čan sm	qəh(t) čan səm	qɑ́h čɛ́n səm	*I'm gonna lift it up*
b.	θh-t	θəh-t	θʌ́ht ~ θɑ́ht	*prop s.t. up*
b'.	hu ga θh-t	hu ga θəht	hó gʌ θʌ́ht^h	*go prop it up*
b".	θh-ʔm=min	θəh-ʔamin	θʌ́hʔʌmɛn	*centre pole for tent*

The data in (85) provides evidence that /i/ is retracted and lowered to [ɛ] in the environment of [h]; therefore, /h/ is marked as PHAR. The different effects on schwa before /ʔ/ may be attributed to the other marked properties of /ʔ/.

(85)

	Input		Output	Gloss
a.	hiw=čis	hiwčis	hɛ́wčɩs	*paddle*
a'.	IMP-hiw=čis-ma	hi-hiwčisma	hɛ́hɛwčɩsma	*get there by paddling*

The fact that [h] is the epenthetic (Onset) consonant in the language provides support for its default representation; it is the least specified consonant in the system.

2.4 Vowel System

The goal of the remainder of this chapter is to present the phonetic vowel inventory and show how the surface vowels are derived from the four vowel system: i, u, a, ə. Schwa is treated as an epenthetic non-moraic Nucleus. Its prosodic distribution and properties will be discussed in more detail in Chapters 3-6 but its phonetic realization is addressed here. §2.4.2 provides evidence for a three way weight contrast in the language: schwa which is proposed to be non-moraic, full vowels which are moraic, and long vowels which are bimoraic, and are derived via Compensatory Lengthening. The hypothesis put forward here is that this weight contrast in Sliammon is encoded phonologically in terms of moraic structure, following the generalizations originally made in Blake (1992), and recast within the Nuclear Moraic Model of Shaw (1993 et seq.). §2.4.3 discusses the full vowels /i, u, a/ and the consonant-vowel interaction which accounts for the variant surface realization of each of these vowels. §2.4.4 documents the effects of adjacent consonants (and vowels) on the surface realization of schwa. §2.4.5 introduces the issue of Full Vowel Reduction which occurs in unstressed syllables; this is discussed further in Chapter 4.

2.4.1 Vowel Inventory

Sliammon has a large number of phonetic vowels, as shown by the inventory in (86), following Davis (1971), Blake (1992), Watanabe (1994).

(86)

i ɨ u

ɪ ᵻ

ʊ

o

e

ɛ ə ɔ

(æ) ʌ

a ɑ

The surface inventory includes tense and lax variants, front-central-back and hi-mid-low realizations. As shown by (86), there are no front rounded vowels nor are there any low rounded vowels in the system (i.e. [ɔ] is treated as non-low).

The phonetic vowels in (86) are allophones of a vowel system based on three underlying contrasts /i, u, a/ plus an epenthetic default vowel "schwa". The vowel contrast in Sliammon is low/non-low distinction (cf. Blake 1992). The non-low vowels /i, u/ are most often realized as [e, o] respectively. The allophones of the low vowel /a/ range from [ɛ (æ) ~ a ~ ɑ] and depend on the place of articulation of the adjacent consonants. I have changed my former usage (Blake (1992)) of /e, o, a/ as the basic phonemic symbols to adopt /i, u, a/, in order to minimize phonemic transcription differences between authors writing on Sliammon, and to also make it easier for those wishing to do comparative research in Salish.[1] The underlying representation for each of the Full vowels /i, u, a/ is presented in (87).

(87) i, u, a

i	u	a
√o |\ [-cons] | PN | DOR [-bk]	√o |\ [-cons] | PN / \ LAB DOR [rd]	√o |\ [-cons] | PN | DOR [lo]

The surface height of the non-low vowels /i, u/ is determined by the height of adjacent consonants, via consonant-vowel (C-V) feature sharing. The phonemes /i, u/ are [i, u] next to alveopalatals/palatals, whereas they are [e, o] in a "neutral" context, and are retracted to [ɛ, ɔ] in the environment of PHAR consonants. The vowel system of Sliammon has received a fair bit of

[1]Kinkade (1997: 212, fn.1) makes a similar point with respect to the phonemic vowel inventory of Upper Chehalis.

discussion in J.Davis (1970, 1971), Kroeber (1989), Blake (1992, 1999), Watanabe (1994). The featural specification of the allophones of the full vowels is provided in (88).

(88)

	/i/			/a/				/u/		
	[i]	[e]	[ɛ]	[ɛ]	[a]	[ʌ]	[ɑ]	[u]	[o]	[ɔ]
RN	o	o	o	o	o	o	o	o	o	o
[-cons]	[-cons]	[-cons]	[-cons]	[-cons]	[-cons]	[-cons]	[-cons]	[-cons]	[-cons]	[-cons]
PN	o	o	o	o	o	o	o	o	o	o
LAB								LAB	LAB	LAB
[rd]								[rd]	[rd]	[rd]
DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR
[hi]	[hi]							[hi]		
[-bk]	[-bk]	[-bk]	[-bk]	[-bk]						
[lo]					[lo]	[lo]	[lo]			
PHAR			PHAR	PHAR		(PHAR)	PHAR			PHAR

The basic featural identity of /i/ is DOR [-bk]. Its variant realizations are outlined in (89).

(89)

/i/ is realized as [i] in the environment of a [hi] consonant (alveo-palatals and velars).

/i/ is realized as [ɛ] in the environment of a post-velar consonant (uvulars & laryngeals), i.e. PHAR.

/i/ is realized as [ɛ] in the environment of glottalized consonants.

/i/ is realized as [e] elsewhere.

/i/ is laxed to [ɩ] in unstressed position in the environment of a [hi] consonant.

/i/ is laxed to [ɛ] in other unstressed contexts.

The basic featural identity of /u/ is LAB [rd] DOR. Its variant realizations are outlined in (90).

(90)

/u/ is realized as [u] in the environment of a [hi] consonant (alveo-palatals and velars).

/u/ is realized as [ɔ] in the environment of a post-velar consonant (uvulars & laryngeals), i.e. PHAR.

/u/ is realized as [ɔ] in the environment of glottalized consonants.

/u/ is realized as [o] elsewhere.

/u/ is laxed to [ʊ] in unstressed position in the environment of a [hi] consonant.

/u/ is laxed to [ɔ] in other unstressed contexts.

The basic featural identity of /a/ is DOR [lo]. Its variant realizations are outlined in (91).

(91)

/a/ is realized as [ɛ] after a [-back] consonant (alveo-palatals/palatals).

/a/ is realized as [a ~ æ] in the environment of a non-sonorant lateral (ƛ, ƛ̓, ɬ).

/a/ is realized as [ɑ] in the environment of post-velars (uvulars and laryngeals), i.e. PHAR.

/a/ varies between [a ~ ʌ] in the environment of anterior consonants (coronals and labials).

/a/ is realized as [ɑ] elsewhere.

/a/ is laxed to [ʌ] in unstressed post-tonic position.

The allophones of schwa are given in (92), and discussed in further detail in §2.4.4.

(92)

schwa is realized as [ʊ] in the environment of a tautosyllabic [hi, rd] consonant (labio-velars)

schwa is realized as [ɔ] (rounded midback V) before a non-high [rd] C (labio-uvular)

schwa is realized as [ɩ] in the environment of a [hi, -bk] consonant (alveo-palatal/palatal)

schwa is realized as [ɛ] between a [-back] consonant and a PHAR consonant

schwa is realized as [ɨ ~ ɨ] in the environment of a [hi] consonant (plain velars)

schwa is realized as [ʌ] is the environment of a plain uvular, i.e. DOR PHAR

schwa is realized as [ɑ] in the environment of laryngeals (ʔ, h), i.e. PHAR and LAR.

Sliammon also has a limited number of surface long vowels (i.e. [i:, e:, ɛ:, u:, o:, a:]) which are all derived through compensatory lengthening, here treated as the loss of a moraic coda consonant. Analyses of how surface long vowels are derived are presented in detail in J.Davis (1970: 52-56), and Blake (1992, Chapter 3), and due to space limitations will not be discussed further here.

The primary focus of the remainder of this chapter is on the weight contrast between schwa and the full vowels /i, u, a/, and their respective surface phonetic realizations.

2.4.2 Vowel Quantity

The next section explores the evidence for a distinction in vowel quantity or weight, as represented by the prosodic constituant "mora". Sliammon exhibits a weight contrast between the allophones of schwa, and the allophones of the full vowels /i, u, a/.

2.4.2.1 Phonological Weight Contrast

Phonetically the full vowels /i, u, a/ are half-long [v·] in stressed open syllables, as shown by the data in (93). This point is documented independently by Watanabe (p.c.). Notice that the stressed vowel in (93.a) is also recorded with an off-glide [ei]. Diphthongization is another diagnostic for the constrast between schwa on the one hand, and the full vowels /i, u, a/ on the other hand.

(93)

	Input		Output	Gloss
a.	pilaq	pilaq	pé·lʌq^{h} (~ péilʌq^{h})	*bracket fungus*
b.	ʔimin	ʔimin	ʔɛ́·mɪn	*door*
c.	qigaθ	qigaθ	qé·gʌθ	*deer*
d.	k^{w}upa	k^{w}upa	k^{w}ú·pa ~ k^{w}ú·pʌ	*grandfather, grampa*
e.	ʔupan	ʔupan	ʔó·pʌn	*ten*
f.	x̌aƛ̓-ng-mi č	x̌áƛ̓numič	x̌ɑ́ƛ̓nò·mɪč	*I love you*
g.	t̓ap̓as	t̓áp̓as	t̓á·p̓ʌs	*cave*
h.	t̓^{θ}at̓iq̓	t̓^{θ}át̓iq̓	t̓^{θ}á·t̓ɛq̓	*a drop of water*
i.	ʔamamuʔ	ʔamamuʔ	ʔɑ́·mamɔ̀ʔ	*chiton*

Schwa, on the other hand, is noticeably shorter in duration, and surfaces consistently as a brief lax vowel, as in (94).

(94)

	Input		Output	Gloss
a.	č̓ɬ	č̓əɬ	č̓ɪ́ɬ	*rain*
b.	θč̓	θəč̓	θɪ́č̓	*straight*
c.	mkʷ-t	məkʷ-t	mʊ́kʷtʰ	*eat it*
d.	č̓ʔ=umixʷ=tn	č̓əʔumixʷtən[2]	č̓ɔ́ʔomɛ̀xʷtən	*floor rug, carpet*
e.	t̓ᶿm=tn	t̓ᶿəmtn	t̓ᶿə́mtn̩	*breast*
f.	sq̓-t	səq̓t	sʌ́q̓t	*peel it off*
g.	mʔ-t	məʔt	mɑ́ʔt	*get it*

Kroeber (1989: 108) also observes that schwa and the surface variants of schwa are generally "lax and a bit shorter than the allophones of non-schwa vowels, at least in stressed open syllables."

2.4.2.2 Theoretical Assumptions

The main purpose of the next section is to put forth a proposal which captures this observed durational contrast. The question which this observation raises is how is this length contrast encoded phonologically?

Blake (1992) proposes that schwa and the following moraic coda consonant share a mora resulting in a mono-moraic syllable whereas a full vowel and following moraic coda consonant are both moraic resulting in a bi-moraic syllable. This entails a syntagmatic rule of weight-by-position which is sensitive to whether or not the coda consonant is preceded by a full vowel or by schwa.

---

[2]The labialization of schwa to [ɔ] in this context comes from the full vowel /u/ in the following syllable. This is an instance of translaryngeal harmony (see §2.4.4.5). The root č̓əʔ- *be on top of* surfaces as [č̓ɛ́ʔ-] in other phonological contexts, as shown by forms like /č̓ʔ=nač=tn/ [č̓ɛ́ʔnʌčtɪn] *small blanket to sit on.*

2.4.2.3 Representation of Weight Contrast: Nuclear Moraic Model

In this dissertation, this leading idea is recast within the Nuclear Moraic Model of Shaw (1993, 1994, 1996c). Within this model, schwa is Nuclear, and non-moraic. The prosodic representation for schwa is given in (95).

(95) Nuc

The hypothesis put forward within the Nuclear Moraic Model is that schwa is weightless. Since it lacks phonological weight (i.e. a mora), the fact that it is perceptually shorter in duration is encoded in its phonological representation. In addition to the prosodic representation of this vowel (i.e. a bare nucleus), it is also claimed here that schwa lacks inherent phonological features and as such is subject to colouration by adjacent consonants (and vocalic nuclei), as argued in Blake (1992:35-42). The range of phonetic colouration of schwa is sketched in §2.4.1 above, and explored in greater detail in §2.4.4.

Full vowels, on the other hand, are represented as both Nuclear and moraic, as in (96). The full vowels /i, u, a/ each dominate specific vocalic place features as specified in (88), and schematically represented here as [f].

(96)

Nuc
|
μ
|
[f]

The fact that schwa is shorter than the full vowels /i, u, a/ is encoded here by a difference in moraic structure. The proposal that schwa is non-moraic in Sliammon is supported by the phonological behaviour of CəC weak roots versus CAC Strong Roots (cf. Blake 1992:40-42; Blake 1999).

This proposed difference in prosodic structure (Nuclear non-moraic versus Nuclear moraic) will play a central role in determining the distribution of schwa. Prosodic structure of Sliammon is discussed in more detail in Chapter 3 where additional evidence is provided in favour of the weight contrast introduced here.

This proposal regarding the distinction between schwa on the one hand, and the full vowels on the other hand draws significantly on the research of Shaw (1993 et seq.) on other neighbouring Salish languages (St'át'imcets (Lillooet), Nuχalk (Bella Coola), and hən̓q̓əmin̓əm̓ (Musqueam Salish). This theoretical model provides insight into the behaviour of schwa in Sliammon, and provides an alternative analysis to Blake (1992).

2.4.3 Full Vowels

2.4.3.1 Surface Realization of the Full Vowels

The next section discusses the allophonic realization of the full vowels /i, u, a/.

2.4.3.1.1 Retraction

The Full Vowels are systematically lowered before and after uvulars, and laryngeals ʔ/h indicating that these post-velar sounds function together as a natural class. As seen in §2.3.2.1.5, it is proposed that this class is captured by hypothesizing that these segments share PHAR specification. This PHAR specification triggers retraction of /i, u, a/, as in (97).

(97) **Retraction**

/i/	→	[ɛ] / PHAR
/u/	→	[ɔ] / PHAR
/a/	→	[ɑ] / PHAR

This lowering takes place in both stressed and unstressed syllables, and is illustrated by the data in (98-106). Since full vowels are generally laxed in unstressed closed syllables, the discussion here will focus on full vowels in stressed syllables.

The [-bk] vowel /i/ is retracted in the environment before and after post-velars (uvulars and laryngeals), as shown by the data in (98-101). It is retracted in stressed open and stressed closed syllables alike which shows that the presence of [ɛ] cannot be attributed to a constraint on closed syllable shortening, for example.

(98) Retraction of /i/ with uvulars

	Input		Output	Gloss
a.	qiqtiʔ (DIM?)	qiqtiʔ	qɛ́q . tɛʔ	*youngest in family*
b.	L'-DIM-x̌nq̓+[i]	x̌[iʔ]i-x̌n[i]q̓	x̌ɛ́ . ʔɛx̌ . nɛq̓	*Owl's Grove*
c.	mix̌aɬ	mix̌aɬ	mɛ́ . x̌ʌɬ	*black bear*

(99) Retraction of /i/ with laryngeals

	Input		Output	Gloss
a.	ʔilq̓=ay	ʔilq̓ay	ʔɛ́l . q̓ay	*barbecued deer meat*
b.	ʔiɬtan	ʔiɬtan	ʔɛ́ɬ . tən ~ ʔɛ́ɬ . tʌn	*to eat, food*
b'.	IMP-ʔiɬtan+[ʔ] č	ʔi-ʔiɬtan̓ č	ʔɛ́ . ʔɛɬ . tʌ̀n̓čʰ	*I'm eating*
c.	ʔinhus	ʔinhus	ʔɛ́n . hos ~ ʔɛ́n . hɔs	*new moon, month*
d.	θiʔθa	θiʔθa	θɛ́ʔ . θa	*that one (fem.)*
e.	hig̓in	hiʔgin	hɛ́ʔ . gɪn	*strawberry*
f.	DIM-hkʷiʔ[i]qʷ	hihkʷiʔiqʷ	hɛ́h . kʷi . ʔɛqʷ	*great-gr. grandmother*
g.	DIM-higus	hi-həgus	hɛ́ . həgus ~ hɛ́həgʊs	*small chief*

The data in (100) shows that /i/ is also systematically retracted in the environment of glottalized consonants.

(100) Retraction of /i/ with glottalized consonants

	Input		Output	Gloss
a.	t̓in	t̓in	t̓ɛ́n	*barbecued fish*
a'.	IMP-t̓in-ʔm	t̓i-t̓in-ʔəm	t̓ɛ́ . t̓ɛn . ʔəm	*barbecuing fish*
b.	k̓ʷin	k̓ʷin	k̓ʷɛ́n	*how many*
c.	t̓ᶿit̓ᶿik̓ʷ	t̓ᶿit̓ᶿik̓ʷ	t̓ᶿɛ́ . t̓ᶿɛk̓ʷ	*worm*
d.	t̓ᶿit̓ᶿiq̓	t̓ᶿit̓ᶿiq̓	t̓ᶿɛ́ . t̓ᶿɛq̓	*mud*
e.	t̓in̓iqʷ	t̓iʔniqʷ	t̓ɛ́ʔ . nɛqʷ	*salmonberries*

Note that Retraction is obligatory, as indicated by the contrast between the grammatical examples in (101) Column 2 versus the ungrammatical examples in (101) Column 3. Focus on the quality of the stressed vowel in each example. Failure to retract the vowel /i/ in the environment of a post-velar or glottalized consonant is clearly ungrammatical, judging from comments made by speakers of the language.

(101)

	Input	Retraction	No Retraction	Gloss
a.	qiqtiʔ	qɛ́q . tɛʔ	*qíq . tɛʔ	*youngest in family*
a'.			*qéq . tɛʔ	
b.	mix̌aɬ	mɛ́ . x̌ʌɬ	*mí . x̌ʌɬ	*black bear*
b'.			*mé . x̌ʌɬ	
c.	ʔiɬtan	ʔɛ́ɬ . tʌn	*ʔíɬ . tʌn	*to eat, food*
c'.			*ʔéɬ . tʌn	
d.	ʔinhus	ʔɛ́n . hos ~ ʔɛ́n . hɔs	*ʔín . hɔs	*new moon, month*
d'.			*ʔén . hɔs	
e.	t̓in	t̓ɛ́n	*t̓ín	*barbecued salmon*
e'.			*t̓én	
f.	k̓ʷin	k̓ʷɛ́n	*k̓ʷín	*how many*

f'.			*k̓ʷén	
g.	t̓ᶿit̓ᶿik̓ʷ	t̓ᶿɛ́ . t̓ᶿɛk̓ʷ	*t̓ᶿí . t̓ᶿɛk̓ʷ	*worm*
g'.			*t̓ᶿé . t̓ᶿɛk̓ʷ	
h.	t̓in̓iqʷ	t̓ɛ́ʔ . nɛqʷ	*t̓íʔ . nɛqʷ	*salmonberries*
h'.			*t̓éʔ . nɛqʷ	

The vowel /u/ is retracted and realized as [ɔ] before post-velars or glottalized consonants, as shown by the data in (102-104). The retraction of /u/ parallels the observed behaviour of /i/ discussed in (98-101) above.

(102) Retraction of /u/ with post-velars

	Input		Output	Gloss
a.	ǰuqʷǰuqʷ / ǰəqʷ	ǰuqʷǰuqʷ	ǰɔ́qʷ . ǰɔqʷ .	*lukewarm water*
b.	DIM-x̌ʷusm+[i]+[ʔ]	x̌ʷu-x̌ʷsim̓	x̌ʷɔ́x̌ʷ . sɪm̓ .	*small soapberry*
c.	p̓uhu	p̓uhu	p̓ɔ́ . hɔ .	*raven*
d.	ʔamamuʔ	ʔamamuʔ	ʔɑ́ . mɑ . mɔ̀ʔ .	*chiton*
e.	č̓uʔč̓uʔ	č̓uʔč̓uʔ	č̓ɔ́ʔ . č̓ɔʔ	*wren*
f.	IMP-ʔuɬqʷu+[ʔ]	ʔu-ʔuɬqʷuʔ	ʔó . ʔɔɬ . qʷɔ̀ʔ .	*digging clams*

(103) Retraction of /u/ with glottalized consonants

	Input		Output	Gloss
a.	k̓ʷun̓ut̓	k̓ʷun̓ut̓	k̓ʷɔ́ʔ . nɔt̓	*porpoise*
b.	hum̓hum	hum̓hum	hɔ́m̓ . hɔm	*blue grouse*
c.	ɬuɬmum̓	ɬuɬmum̓	ɬóɬ . mɔ̀m̓	*littleneck clam*

Failure to undergo retraction is judged as ungrammatical, as shown by the data in (104).

(104)

	Input	Retraction	No Retraction	Gloss
a.	DIM-x̌ʷusm+[i]+[ʔ]	x̌ʷɔ́x̌ʷ . sɩm̓ .	*x̌ʷúx̌ʷ . sɩm̓ .	*small soapberry*
b.	p̓uhu	p̓ɔ́ . hɔ .	*p̓ú . hu .	*raven*
c.	ʔamamuʔ	ʔɑ́ . mɑ . mɔ̀ʔ .	*ʔɑ́ . mɑ . mùʔ .	*chiton*
c'.			*ʔɑ́ . mɑ . mòʔ .	
d.	č̓uʔč̓uʔ	č̓ɔ́ʔ . č̓ɔʔ .	*č̓ɔ́ʔ . č̓ɔʔ	*wren (also: č̓ɛ́č̓ɔʔč̓ɔʔ)*
d'.			*č̓óʔ . č̓ɔʔ	
e.	hum̓hum	hɔ́m̓ . hɔm .	*húm̓ . hɔm .	*blue grouse*
e'.			*hóm̓ . hɔm .	
f.	ɬuɬmum̓	ɬóɬ . mɔ̀m̓ .	*ɬóɬ . mùm̓ .	*littleneck clam*
f'.			*ɬóɬ . mòm̓ .	

The low vowel /a/ is retracted and realized as [ɑ] in the environment of post-velars, as shown by the data in (105-106).

(105) Retraction of /a/ in the environment of uvulars

	Input		Output	Gloss
a.	DIM-qayx̌=uɬ	qa-qyx̌ʷuɬ	qɑ́ . qe . x̌ʷʊɬ	*small Mink*
b.	IMP-qʷasm+[ʔ]	qʷa-qʷasəm̓	qʷɑ́ . qʷɑ . səm̓	*blooming, flowering*
b'.	DIM-qʷasm+[ʔ]	qʷa-qʷs[ə]m̓	qʷɑ́qʷ. səm̓	*little flower*
c.	DIM-q̓ʷat̓m[-i-]+[ʔ]	q̓ʷa-q̓ʷt̓[i]m̓	q̓ʷɑ́q̓ʷ . t̓ɛm̓	*small river, creek*
d.	IMP-x̌ʷaǰ-t-awɬ	x̌ʷa-x̌ʷaǰ[a]tawɬ	x̌ʷɑ́x̌ʷ . ǰe . tʌwɬ	*fighting each other*

(106) Retraction of /a/ with laryngeals

	Input		Output	Gloss
a.	IMP-ʔaθ-m+[ʔ]	ʔa-ʔaθ-əm̓	ʔɑ́ . ʔɑ . θʌm̓	*giving (at a potlatch)*
b.	ʔah	ʔah	ʔɑ́h	*sore, pain*
b'.	IMP-ʔah-m+[ʔ] č	ʔa-ʔah-əm̓ č	ʔɑ́ . ʔɑ . hʌm̓č^{h}	*I'm hurting*
c.	IMP-ʔax^{w}+[ʔ]	ʔa-ʔax^{w}	ʔɑ́ . ʔɑx^{w} .	*it's snowing*
d.	DIM-k^{w}upa+[ʔ]	k^{w}u-k^{w}paʔ	k^{w}úk^{w} . pɑʔ .	*grandfather*

The allophone [a] (DOR [lo]) and the retracted allophone [ɑ] (DOR [lo] PHAR) are both written as a script 'a' in the remainder to this thesis.

Retraction results from consonant-vowel feature sharing, as illustrated in (107). A capital Q is used to refer to the class of PHAR consonants in the language.

(107) Retraction

```
a.                      b.                        c.

 i       Q               u       Q                 a      Q
 |       |               |       |                 |      |
 PN      PN              PN      PN                PN     PN
 | \     /               |   \   /                 |  \   /
 |  \   /                |    \ /                  |   \ /
DOR  PHAR              LAB DOR  PHAR              DOR  PHAR
[-bk]                  [rd]                       [lo]

   [ɛ]                      [ɔ]                       [ɑ]
```

As shown by the representations in (107), each retracted vowel [ɛ, ɔ, ɑ] is characterized by its surface PHAR specification.

2.4.3.1.2 Place Assimilation

The non-low vowels /i, u/ are realized as [i, u] in the environment of DOR[hi] consonants (alveo-palatals and velars), as shown by the data in (108).

(108)

	Input		Output	Gloss
a.	DIM-čuǰ̓=uɬ	ču-čǰ̓=uɬ	čúč . ǰʊɬ	*small child*
b.	IMP-ǰux̌ʷ-t+[ʔ]	ǰu-ǰux̌ʷ-ət	ǰú . ǰo . x̌ʷʌt	*vomiting*
c.	IMP-guh-Vm+[ʔ]	gu-guh-um̓	gú . gu . hom̓	*barking*

(109)

```
   u          č
   |          |
   PN         PN
   /\         |
LAB DOR      DOR
[rd]   \     / |
        \   /  [-bk]
        [hi]
```

The low vowel /a/ is realized as [ɛ] after alveo-palatals, as in (110).

(110) [ɛ]

	Input		Output	Gloss
a.	ʔayaʔ-hV	ʔaya-ha-ʔ	ʔá . yɛ . hàʔ	*he's got a house*
b.	DIM-say̓ǰa+[ʔ]	sa-syǰaʔ	sá . si· . ǰɛʔ	*small leaf*
c.	DIM-č̓an̓u+[ʔ]	č̓a-č̓n̓uʔ	č̓ɛ́č̓ . noʔ	*little dog*
d.	DIM-č̓ag=’ay+[ʔ]	č̓a-č̓g̓ay̓	č̓ɛ́č̓ . gʌý̓	*small wooden spoon*
e.	DIM-ǰanxʷ[-i-]=uɬ+[ʔ]	ǰa-ǰn[i]xʷ=uɬ	ǰɛ́ǰ . ne . xʷùɬ	*small fish*
f.	DIM-yax̌ay+[ʔ]	ya-yx̌ay̓	yɛ́y . x̌ʌý̓	*small clam basket*
g.	IMP-č̓ah-m+[ʔ]	č̓a-č̓ah-əm̓	č̓ɛ́ . č̓ɛ . həm̓	*praying*
g'.	IMP-č̓ah-’Vg-m	č̓a-č̓ah-ag-əm	č̓ɛ́ . č̓ɛ . hà . gəm	*they're all praying*
h.	IMP-yax̌+[ʔ]	ya-yax̌	yɛ́ . yʌx̌	*sobering up*

This is analyzed here as partial assimilation to the preceding alveo-palatal. This is illustrated by the representation in (111).

(111)

```
   č        a
   |        |
   PN       PN
   |        |
  DOR      DOR
  /   \   /   \
[hi] [-bk] [lo]

   [čɛ]
```

The fact that the feature [hi] fails to spread is encoded in the grounded constraints *HI/LO and *LO/HI. It is also proposed here that spreading of [-bk] entails the loss of the feature [lo] (if [-bk] then not [lo]).

As noted earlier, the low vowel /a/ is never rounded. This follows from the general lack of low round vowels in system, and is analyzed formally as a high-ranking grounded constraint *LO/RD, following Archangeli and Pulleyblank (1994).

Archangeli and Pulleyblank (1994) develop a model in which features (f-elements) freely combine in order to derive the inventory of consonants and vowels in a particular language. Combinatorial specification is constrained by phonetically-motivated grounded conditions which ban antagonistic articulatory gestures (i.e. a vowel cannot be both high and low at the same time - *HI/LO) and permit combinations which are compatible from an articulatory perspective. It will be argued here that consonant-vowel interaction in Sliammon is also constrained by grounded constraints.

2.4.3.1.3 Effect of Anterior Consonants on /a/

The low vowel /a/ [a] occurs in free variation with [ʌ] in the environment of labial and coronal (anterior) consonants. The effect is gradient and variable. Examples of free variation [á ~ ʌ́] are given in (112).

(112)

	Input		Output	Gloss
a.	tan	tan	tə́n ~ tʌ́n	*mother*
b.	man	man	mə́n ~ mʌ́n	*father*
c.	nat	nat	nə́t ~ nʌ́t	*night*
d.	pipa	pipa	pípa ~ pípʌ	*paper*
e.	ppa	pəpa	pə́pa ~ pə́pʌ	*pepper*

In the context of consonants specified for [hi], /a/ is realized as [ʌ], as shown by the morphologically related forms in (113). The vowel and surface form of the following [hi] consonant /g/ are underlined in Column 3.

(113)

	Input		Output	Gloss
a.	maga[3]	maga	mʌ́gʌ	*cougar*
b.	DIM-maga=uɬ	ma-m<u>aga</u>-wəɬ	mʌ́m<u>ʌg</u>òwəɬ	*little cougar*
c.	CəCPL-maga	məw-m<u>aga</u>	mə́wm<u>ʌ́g</u>ə	*cougars*
d.	mi-mag+[ʔ]	mi-m<u>aw̓</u>	mé:m<u>ʌw̓</u>	*cat*

2.4.3.1.4 Interaction of Retraction and Place Assimilation

In general, Retraction takes precedence over spreading of DOR[hi], as shown in (102.a; 108.b) for example. Retraction and the spreading of DOR[-bk] are sympathetic, as shown by the data in (110.b). The data in (114-115) show some conflicting tendencies. The data in (114) shows that the vowel /u/ is realized as DOR[hi] when it occurs between DOR[hi] consonants (k̓ʷ_ǰ and xʷ_ǰ) even though the vowel /u/ is immediately followed by the laryngeal constriction associated with /ǰ/. This provides evidence that the glottalization associated with /ǰ/ does not entail the

---

[3] This Root also shows some irregular behaviour. It is written elsewhere in this dissertation as /mga/ məga 'cougar'; however, the diminutive form with the retention of the Root vowel is expected with strong roots of the form CACA, and not with weak CCA Roots.

presence of the PHAR node (cf. the representation of /ʕ̓/ in (80)). The examples involve the surface realization of the LS=uʕ̓a *hand, lower arm.*

(114) =uʕ̓a [=uʔʕ̌ɛ]

	Input		Output	Gloss
a.	t̓ᶿik̓ʷ=uʕ̓a	t̓ᶿík̓ʷùʔʕ̌a	t̓ᶿɛ́k̓ʷùʔʕ̌ɛ	*left-handed*
b.	ƛ̓pxʷ=uʕ̓a	ƛ̓ə́pxʷuʔʕ̌a	ƛ̓ʌ́pxʷuʔʕ̌ɛ	*break one's arm, hand*

When /u/ is preceded by a labial or coronal consonant, the non-low back rounded vowel /u/ is realized as [o] (its most "neutral" realization), as shown by the morphologically related forms in (115).

(115) =uʕ̓a [=oʔʕ̌ɛ]

	Input		Output	Gloss
a.	č̓t̓=uʕ̓a	č̓ə́t̓uʔʕ̌a	č̓ít̓oʔʕ̌ɛʰ	*cut one's hand*
b.	šɬp̓=uʕ̓a	šə́ɬp̓ùʔʕ̌a	šíɬp̓òʔʕ̌ɛ	*slip out of one's hand*
c.	č̓m̓=uʕ̓a	č̓áʔmuʔʕ̌a	č̓éʔᵊmoʔʕ̌ɛʰ	*cold hands*

The vowel /a/ also surfaces as [ʌ] in the environment of a uvular, as shown in (116).

(116)

	Input		Output	Gloss
a.	q̓ʷalas	q̓ʷalas	q̓ʷɑ́l:ʌs	*raccoon*
a'.	DIM-q̓ʷalas=uɬ	q̓ʷa-q̓ʷalasuɬ	q̓ʷʌ́q̓ʷəla·sòɬ	*little raccoon*
a".	CəCPL-q̓ʷalas	q̓ʷəl-q̓ʷalas	q̓ʷʌ́lq̓ʷɑlʌs	*raccoons*
b.	x̌ap̓	x̌ap̓	x̌ɑ́p̓ ~ x̌ʌ́p̓	*papoose basket*
c.	yax̌ay	yax̌ay	yʌ́x̌ʌy ~ yɛ́x̌ʌy	*berry-picking basket*
d.	q̓ast	q̓ast	q̓ɑ́st ~ q̓ʌ́st	*special person in yr. life*

The example which is of particular interest is the diminutive (DIM) in (116.a'). Notice that the low vowel a is realized as [ʌ] is a stressed open syllable which is preceded and followed by a labio-uvular consonant. Uvulars are proposed to be DOR PHAR. Notice that the resulting vowel [ʌ] is not rounded which follows from the fact that there are no low round vowels in the language. If the root were q̓ʷəlas, we would expect a diminutive form in Ci- as well as labialization of the stressed vowel in a total labio-uvular context (cf. Blake (1992), Watanabe (1994, 2000), and Blake (in prep) on Reduplication in Sliammon). The morphological evidence clearly points to the underlying vowel here being /a/; however, the surface realization [ʌ́] instead of [ɑ] entails total Place Assimilation to the uvular. The low vowel /a/ is realized as DOR PHAR. The effects of uvulars (and post-velars in general) on vowels in Sliammon merits further study.

2.4.3.2 Full Vowel / Consonant Interaction

The next section presents a summary of the effects of both preceding and following consonants on the full vowels /i, u, a/. The tables in (117-119) summarize the realization of the full vowels /i, u, a/ in an initial stressed closed syllable.

(117) /i/ DOR [-bk]

C2 C1	LAB	COR	DOR[hi]	PHAR
LAB	é ~ í	é	é	έ
COR	é	é ~ í	í	έ
DOR[hi]	í	í	í	έ
PHAR	έ	έ	έ	έ

The specification DOR[hi] is used here to include alveopalatals, palatals and velars irrespective of their specification for the feature [back]. PHAR identifies the class of post-velars.

(118) /ú/ LAB[rd] DOR

C2 C1	LAB	COR	DOR[hi]	PHAR
LAB	ó	ó ~ ú	ú	ɔ́ ~ ó
COR	ó	ó	ú	ɔ́ ~ ó
DOR [hi]	ú	ú ~ ó	ú	ɔ́ ~ ó
PHAR	ɔ́ ~ ó	ó	ó	ɔ́ ~ ó

It should be noted that the following consonant appears to exert a stronger influence on the resultant vowel quality than the preceding consonant does; although, in the case of the preceding PHAR and following DOR[hi], /u/ is realized as [ó] and not as *[ú] showing that Retraction is less costly than DOR[hi] assimilation. This is a classic case of constraint conflict, and provides evidence for the ranking: *DOR[hi] >> *PHAR.

The summary of the surface realization of /a/ in (119) includes a distinction between alveopalatals/palatals (DOR[hi, -bk]) and the velars (DOR[hi]) in order to underscore the effects of a preceding alveopalatal on the realization of /a/, as discussed in (110).

(119) /a/ DOR [lo]

C2 C1	LAB	COR	DOR[hi, -bk]	DOR[hi]	PHAR
LAB	ɑ́	ɑ́ ~ ʌ́	ɑ́	ɑ́	ɑ́
COR	ɑ́	ɑ́	á ~ ǽ	á ~ ɑ́	ɑ́
DOR[hi, -bk]	ɛ́	ɛ́	é ~ ɛ́	ɛ́	ɛ́
DOR[hi]	á ~ ǽ	ɑ́	ɑ́	ɑ́	ɑ́
PHAR	ɑ́	ɑ́	á ~ ɑ́	á ~ ʌ́	ɑ́

2.4.3.2.1 Proposed Analysis

The surface vowels can be shown to arise from the interaction of constraints which drive Retraction and Place Assimilation. The intuition behind this analysis is that consonants and vowels which share Place specifications are more highly valued than ones which do not. Consonant-vowel feature sharing occurs subject to a set of constraints which are phonetically grounded in the sense of Archangeli and Pulleyblank (1994). Sympathetic (compatible) articulatory gestures are enhanced and licensed whereas antagonistic articulatory gestures are banned by constraints on possible co-articulation. The grounded constraints which are clearly operative in Sliammon are given in (120).

(120) Grounded Constraints

a.	If a vowel is [-bk], then it is not [rd]	*-BK/RD
b.	If a vowel is [rd], then it is not [-bk]	*RD/-BK
c.	If a vowel is [lo], then it is not [hi]	*LO/HI
d.	If a vowel is [lo], then it is not [rd]	*LO/RD

A high-ranking constraint ensures that Retraction occurs (PHAR place is shared with an adjacent vowel) at the expense of spreading [hi]. This generalization suggests that the grounded condition *PHAR/HI is also operative in Sliammon.

(121)

If PHAR, then not [hi] *PHAR/HI

This accounts for the height of vowels which occur after alveopalatals and before uvulars. The study of Glide Vocalization §2.4.6 also motivates the constraint in (122).

(122)

If [hi], then not PHAR *HI/PHAR

The effect of adjacent consonants on Full Vowels is summarized in (123).

(123)

Full Vowel	Retraction	DOR [hi]	*DOR[hi] >> *PHAR	Grounded Condition
/i/ DOR[-bk]	[ɛ]	[i]	[ɛ]	*-BK/RD
/u/ LAB[rd] DOR	[ɔ]	[u]	[ɔ]	*RD/-BK
/a/ DOR [lo]	[ɑ]	[ɛ]	[ɛ]	*LO/RD
		*LO/HI	*LO/HI	

The output of Full Vowel assimilation to adjacent consonants is subject to the grounded conditions in (120-121). These high-ranking grounded constraints reflect generalizations about Sliammon. There are no front rounded vowels in the language, nor are there any low rounded vowels. These grounded constraints are therefore proposed to be undominated constraints.

The output of Retraction never yields a [hi] retracted vowel (cf. Bessell 1992a). Since full vowels are retracted whenever they are adjacent to a post-velar consonant, I assume that the presence of PHAR (retraction) prohibits the spread of DOR[hi]. This is reflected in the grounded constraint *PHAR/HI in (121)

Sharing of DOR features [hi] and [hi, -bk] occurs from adjacent alveopalatals and velars, the output is given in (123) Column 3. Notice that the low vowel /a/ is never [hi] expressing the fact that vowels can not be both low and high at the same time (120.c). (123) Column 4 shows the effect of consonants on either side of the full vowel. As observed from the data, Retraction (spread of the PHAR node) takes precedence over the spread of the Dorsal feature [hi].

Vowel assimilation to neighbouring consonants in the language seems to be subject to two different sets of constraints - first of all, Faithfulness to the lexical vowel features which establish the contrast between /i, u, a/, and second of all, to the phonetic grounded conditions. A constraint which drives Vowel Assimilation to the neighbouring consonants may be in conflict with the grounded conditions. The grounded constraints must outrank VAssimilation since the opposite ranking would create total assimilation without consideration for the phonetic viability of such a feature-sharing relation. The tableau in (124) shows the effects of this ranking.

(124)

<table>
<tr><th></th><th>FAITH I-O[f]</th><th>Grounded Conditions</th><th>V Assimilation</th></tr>
<tr><td>☞ a. V C
| |
-bk rd</td><td></td><td></td><td>*</td></tr>
<tr><td>b. V C
|\ |
| \|
-bk rd</td><td></td><td>*! (*-BK/RD)</td><td></td></tr>
<tr><td>c. V C
|\ |
| \|
<-bk> rd</td><td>*!</td><td></td><td></td></tr>
</table>

As shown by the optimal candidate in (124.a), C-V feature sharing is violated in order to satisfy the high-ranking Grounded constraint *-BK/RD. Violation of this constraint is ruled out as in (124.b). It is also necessary to consider what rules out candidate (124.c).

Since lexical features of each full vowel are present in the output of Vowel assimilation, this means that Faithfulness and the Grounded Constraints both outrank Vowel Assimilation. It is also proposed here that the vowels never lose their featural content in order to assimilate and satisfy the grounding conditions. Faithfulness of the lexical features (FAITH [f]) associated with both consonants and vowels is high-ranking.

(125) Faith[f] , Grounding >> V Assimilation

What is the cost associated with Vowel Assimilation? There is no insertion of a feature not present in the Input; rather assimilation involves the insertion of a path (association line) between a vowel and adjacent consonantal place features (i.e. a DEP-PATH violation) (cf. Pulleyblank 1996:289-299).

(126)

Faith[f] , Grounding >> V Assimilation >> DEP-PATH

Consider the partial tableau which shows how this works for the full vowels /i, u, a/ when followed by a rounded uvular consonant (Q^w). In order to consider a full range of candidates, the optimal candidate as well as other non-optimal ones, I adopt the following conventions here: [ɛ, ɔ, ɑ] represent the retracted counterparts of the full vowels /i, u, a/ as above. I will use the addition of a small raised ^{w} ([$ɛ^w$, $ɔ^w$, $ɑ^w$]) to indicate a candidate which has undergone both retraction and labial assimilation (the leftward spread of [rd] from the consonant onto the preceding full vowel (or in the case of ɔ sharing of [rd]). The candidates containing [$ɛ^w$, $ɑ^w$] will shown to be non-optimal since they violate the grounded constraints *-BK/RD and *LO/RD respectively.

(127)

Input: /C i Q^w/ V: DOR[-bk] Q^w:LAB[rd] DOR PHAR	FAITH [f]	GROUNDING	V ASSIMILATION	DEP-PATH
☞ a. C ɛ Q^w			* DOR, *RD	*
b. C $ɛ^w$ Q^w		*! (*-BK/RD)	* DOR	**
c. C ɔ Q^w	*! MAX-V [-BK]			*

The symbol ü used in (128.c) stands for a front rounded vowel (i.e. the consonant has spread all of its place features and the vowel u has retained its lexical [rd] specification).

(128)

Input: /C u š/ u: LAB[rd] DOR š: DOR[hi, -bk]	FAITH [f]	GROUNDING	V ASSIMILATION	DEP-PATH
☞ a. C u š			*[-bk]	*
b. C i š	*! <LAB [rd]>			*
c. C ü š		*! (*RD/-BK)		*
d. C o š			*!* DOR[hi, -bk]	

The tableau in (129) shows that /a/ shares a PHAR specification with a following labio-uvular consonant, but that its [rd] specification is not spread onto the vowel due to the high-ranking grounded constraint *LO/RD , which bans low rounded vowels. So although the optimal candidate in (129.a) fails to undergo complete C-V feature sharing as shown by the violation of the constraint V-Assimilation, it does so in order to satisfy the higher-ranked constraints on Faithfulness and Grounding. Candidate (129.b) is ruled out since the [rd] specification has been spread onto an adjacent low vowel; this constitutes a violation of the grounded constraint *LO/RD. Candidate (129.c) is ruled out due to a violation of Faithfulness; the feature [lo] which defines the low vowel /a/ is not present in the Output. Candidate (129.d) is ruled out since consonant-vowel feature sharing (i.e. vowel assimilation) does not take place at all; failure to spread the PHAR node rules this out.

(129)

Input: /C a Q^w/	FAITH [f]	GROUNDING	V ASSIMILATION	DEP-PATH
☞ a. C ɑ Q^w			*[rd]	*
b. C $ɑ^w$ Q^w		*! (*LO/RD)		*
c. C ɔ Q^w	*! <[lo]>			*
d. C a Q^w			*! PHAR, *[rd]	

2.4.4 Schwa

Schwa in Sliammon is subject to colouration from adjacent consonants and vowels. The allophones of schwa are brief in duration. Their quality results from feature sharing with adjacent consonantal and/or vowel place features, with some degree of variation.

Schwa becomes [ι ~ ᵻ ~ ɨ] in the environment of alveopalatals, palatals and plain velars. Schwa is realized as [ʊ] in the environment of labio-velars whereas it is slightly lower and rounded [ɔ] in the environment of labialized uvulars. Schwa is lowered to [ʌ] in the context of plain uvulars, whereas it is lowered to a brief [ɑ] in the environment of ʔ. It should be noted that [ʔ] appears to have a systematic lowering effect on a preceding stressed schwa, a property not always exhibited by [h]. Schwa before [h] varies [ʌ ~ ɑ], as discussed in §2.3.2.1.5 above. Since schwa is realized as [ə ~ ι ~ ᵻ ~ ʊ ~ ɔ ~ ʌ ~ ɑ], it is important to distinguish schwa and the allophones of schwa from the allophones of the full vowels /i, u, a/. The reader is referred to J. Davis (1970 et seq.), Kroeber (1989), Blake (1992), and Watanabe (1994) for similar discussion regarding the surface allophones of schwa.

As argued in §2.4.2.2.1, schwa in Sliammon is analyzed here as a bare Nucleus, devoid of inherent phonological features, and lacking in phonological weight, following Shaw's (1996a, 1996b) analysis of other neighbouring Salishan languages (Lillooet, and Bella Coola). Kinkade (1998: 208) argues that epenthetic schwa in Upper Chehalis is both *non-moraic* and *unspecified for phonological features*, providing additional comparative evidence supporting the proposed representation of schwa in Sliammon.

Matthewson (1994: 4) in her discussion of Lillooet schwa states that "consonants on both sides of /ə/ colour its realization, in a non-discrete fashion, suggesting phonetic interpolation effects rather than phonological processes." Sliammon seems to exhibit some patterns of schwa colouration which are systematic; these are (i) Retraction, (ii) Labialization, and (iii) the effects of preceding Alveopalatals. These three effects are therefore derived by constraint interaction. These effects are distinct from the effects of some preceding consonants on schwa - here I have recorded greater amount of variation, the forms are gradient, and do not seem to have the same status within the grammar - their variability may well be attributed to phonetic interpolation rather than phonological constraints.

The following section provides examples of the allophones of schwa and the range of variation in the output of this vowel.

Schwa is realized as [ə] in a 'neutral' context, as shown by the data in (130). Consider the realization of schwa in the initial stressed closed syllable. These examples are derived via CəC-Plural reduplication; the schwa in question occurs within the reduplicative prefix. As shown by the placement of stress, the reduplicant occurs within the domain of the Prosodic Word.

(130) CəC- Plural Reduplication

	Input		Output	Gloss
a.	CəCPL-p̓m̓a	p̓əm-p̓əʔma	p̓ə́m . p̓ɑ̀ʔ . ma	*wooden floats*
b.	CəCPL-masiq^w	məs-masiq^w	mə́s . mʌ . sɛq^w	*purple sea urchins*
c.	CəCPL-θumin	θəm-θumin	θə́m . θo . mɛn	*eyebrows*
d.	CəCPL-t̓^{θ}amq^{w}ɬ	t̓^{θ}əm-t̓^{θ}amq^{w}ɬ	t̓^{θ}ə́m . t̓^{θ}ʌm . q^{w}ɬ	*lots of clouds*
e.	CəCPL-sup=nač=min	səp-supnačmin	sə́p . sop . nʌč . mɩn	*stumps*
f.	CəCPL-sm̓a	səm-səʔma	sə́m . sɑʔ . ma	*mussels*
g.	CəCPL-tumiš	təm-tumiš	tə́m . to . mɩš	*young men*
h.	CəCPL-tan	tən-tan	tə́n . tan	*lots of mothers*
i.	CəCPL-tala=aya-ap	təl-tala[h]aya[h]ap	tə́l .ta. la. hà . yɛ . hʌp	*your (pl) purses*
j.	CəCPL-t̓in	t̓ən-t̓in	t̓ə́n . t̓ɛn	*barbecued fish*
k.	CəCPL-t̓in̓iq^w	t̓ən-t̓iʔniq^w	t̓ə́n . t̓ɛʔ . nɛq^w	*salmonberries*
l.	CəCPL-ƛ̓apatiɬ root?	ƛ̓əp-ƛ̓apatiɬ	ƛ̓ə́p . ƛ̓ə . pa . tɩɬ	*cedar bark baskets*
m.	CəCPL-q^{w}n̓=iq^{w}ɬa	q^{w}ən-q^{w}əʔniq^{w}ɬa	q^{w}ə́n .q^{w}aʔ .nʊq^w. ɬa	*knees*
n.	CəCPL-ʔasx^w	ʔəs-ʔasx^w	ʔə́s . ʔas . x^w	*seals*

2.4.4.1 Schwa and Retraction

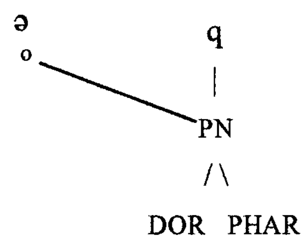
Schwa is realized as [ʌ] in the environment before a plain (non-labialized) uvular consonant, as shown by the data in (131.a-f).

(131) [ʌ]

	Input		Output	Gloss
a.	CəCPL-pq	pəq-pəq	pʌ́q . pʌq	*it's all white*
b.	CəCPL-mqsin	məq-məqsin	mʌ́q . mʌq . sɩn	*noses*
c.	CəCPL-mix̌ał	məx̌-mix̌ał	mʌ́x̌ . mɛ . x̌ʌł	*black bears*
d.	CəCPL-sx̌m	səx̌-səx̌əm	sʌ́x̌ . sʌx̌ʌm	*racing canoes*
e.	CəCPL-t̓$^{\theta}$x̌u	t̓$^{\theta}$əx̌-t̓$^{\theta}$əx̌u	t̓$^{\theta}$ʌ́x̌ . t̓$^{\theta}$ə . x̌^{w}o	*lots of ling cod*
f.	CəCPL-ƛ̓q̓=šin	ƛ̓əq̓-ƛ̓əq̓šin	ƛ̓ʌ́q̓ . ƛ̓ʌq̓ . šin	*lots of moccasins*

This is analyzed as C-V feature sharing; in particular, sharing of the consonantal place node (PN) as shown by the autosegmental representation in (132).

(132)



Schwa is also retracted and realized as [ʌ] before a tautosyllabic glottalized consonant, as shown by the data in (133).

(133) [ʌ]

	Input		Output	Gloss
a.	ƛ̕əm̓-ƛ̕əm	ƛ̕əm̓-ƛ̕əm	ƛ̕ʌ́m̓ƛ̕ʌm	*square*
b.	ɬn̓-t	ɬən̓t	ɬʌ́n̓t	*to weave s.t.*
c.	mƛ̕	məƛ̕	mʌ́ƛ̕	*calm (on water)*
d.	CəCPL-ʔap̓tn	ʔəp̓-ʔap̓tən	ʔʌ́p̓ . ʔap̓ . tən	*green sea urchins*
e.	CəCPL-tm̓	təm-təm̓	tə́m . tʌm̓	*lots of belts*

When schwa follows a uvular or laryngeal consonant it varies between [ə́ ~ ʌ], showing that the preceding segment does not exert as strong an influence on schwa as the one which follows it.

(134) [ə́ ~ ʌ́]

	Input		Output	Gloss
a.	CəCPL-q̓ʷalas	q̓ʷəl-q̓ʷalas	q̓ʷʌ́l . q̓ʷa . ləs	*raccoons*
b.	CəCPL-qʷns	qʷən-qʷənəs	qʷʌ́n . qʷʌn . nɪs	*humpback whales*
c.	CəCPL-qʷasm	qʷəs-qʷasəm	qʷə́s . qʷʌ . səm	*lots of grouse*
d.	CəCPL-ʔatnupil	ʔət-ʔatnupil	ʔʌ́t . ʔat . no . pɛ̀l	*cars*
e.	CəCPL-qap̓=awus	qəp̓-qap̓awus	qʌ́p̓ . qɑ . p̓a . wʊs	*bats*

Schwa becomes [ɑ] before a tautosyllabic glottal, i.e. one not followed by another V. This [ɑ] is brief in duration, and is not as long as [ɑ] from /a/ (cf. Kroeber 1989). Notice that this occurs both before /ʔ/ as in (135.a-c), and before the [ʔ] associated with a glottalized resonant, as in (135.d-f).

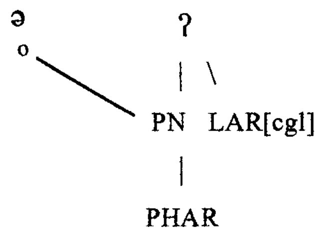
(135) [ɑ]

	Input		Output	Gloss
a.	CəCPL-RED-puʔpxʷ	pəʔ-paʔ-puʔpxʷ	pʌ́ʔ . pɑʔ . pùʔ . pxʷ	*lots of kindling*
b.	CəCPL-qʷaʔɬ	qʷəʔ-qʷaʔɬ	qʷɑ́ʔ . qʷʌʔɬ	*lots of raspberries*
c.	CəCPL-x̌ʷuʔp̓	x̌ʷəʔ-x̌ʷuʔp̓	x̌ʷɑ́ʔ . x̌ʷòʔp̓	*lots of awls*
d.	sm̓a	səʔma	sɑ́ʔmʌ	*mussel*

e. mn̓a	məʔna	mɑ́ʔna ~ mɑ́ʔnʌ	*child, one's offspring*
f. qy̓a	qəʔya	qɑ́ʔyɛ	*water*

The autosegmental representation in (136) illustrates lowering of schwa to [a] before ʔ.

(136)



Although the uvulars and laryngeals form a natural class of PHAR consonants, uvulars are distinct from laryngeals by virtue of their DOR specification (akin to DOR [-hi] within a model which admits binary features). As shown by the data in (135), glottal stop which is specified as both PHAR and LAR [cgl] has a significant lowering affect on schwa, an effect which is not shared with the plain uvulars.

2.4.4.2 Schwa and Labialization

Schwa is realized as [ʊ] when it occurs either before or after a labio-velar consonant, as in (137).

(137) [ʊ] in environment of labio-velar

Input		Output	Gloss
a. CəCPL-pukʷ	pəkʷ-pukʷ	pʊ́kʷ . pukʷ	*lots of books*
b. CəCPL-t̓ᶿkʷa	t̓ᶿəkʷ-t̓ᶿəkʷa	t̓ᶿʊ́kʷ . t̓ᶿə . kʷa	*edible rootstalks*
c. CəCPL-θkʷ=nač=tn	θəkʷ-θəkʷnačtn	θʊ́kʷ . θʊkʷ . nàč . tn̩	*lots of chairs*
d. CəCPL-tixʷθaɬ	təxʷ-tixʷθaɬ	tʊ́xʷ . tixʷ . θʌɬ	*tongues*
e. CəCPL-kʷn̓ay	kʷən-kʷəʔnay	kʷʊ́n . kʷaʔ . nʌy	*lots of lids*
f. CəCPL-k̓ʷaɬt	k̓ʷəɬ-k̓ʷaɬt	k̓ʷʊ́ɬ . k̓ʷʌɬt	*lots of plates*

(138)

```
ə           kʷ
o           |
            PN
            /\
         LAB DOR
         [rd] [hi]
```

Schwa is both retracted and rounded before a labio-uvular consonant, as shown in (139).

(139) [ɔ]

	Input		Output	Gloss
a.	CəCPL-ƛ̓iqʷ=an̓a	ƛ̓əqʷ-ƛ̓iqʷʔana	ƛ̓ɔ́qʷ . ƛ̓ɛqʷ . ʔa . na	*earlobes*
b.	CəCPL-ƛ̓qʷ=inas	ƛ̓əqʷ-ƛ̓əqʷinas	ƛ̓ɔ́qʷ . ƛ̓ɔ . qʷe . nʌs	*hearts*
c.	CəCPL-ɬəq̓ʷ	ɬəq̓ʷ-ɬəq̓ʷ	ɬɔ́q̓ʷ . ɬɔq̓ʷ	*arrows*
d.	CəCPL-ƛ̓x̌ʷ=ay	ƛ̓əx̌ʷ-ƛ̓əx̌ʷay	ƛ̓ɔ́x̌ʷ . ƛ̓ɔ . x̌ʷʌy	*lots of dog salmon*

(140)

```
ə           qʷ
o           |
            PN
           / | \
       LAB DOR PHAR
       [rd]
```

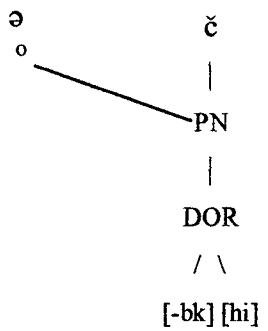
2.4.4.3 Schwa and Place Assimilation

Schwa is realized as [ɩ] between coronals, and as [ɩ] in the environment of DOR[hi] consonants (alveopalatals and plain velars). The relevant syllable is underlined in the Output column of (141).

(141) [ɩ]

	Input		Output	Gloss
a.	CəCPL-θuθin	θəθ-θuθin	θɩ́θ . θo . θɩn	*lips (pl)*
b.	čuǰ̓ CəCPL-saɬtx^{w}	səɬ-saɬtx^{w}	čúy̓ . sɩ́ɬ . saɬ . tx^{w}	*young women*
c.	CəCPL-ƛ̓l̓aq̓an	ƛ̓əl-ƛ̓əʔlaq̓an	ƛ̓ɩ́l . ƛ̓aʔ . là . q̓ʌn	*lots of slugs*
d.	CəCPL-ǰƛ̓=umix^{w}	ǰəƛ̓-ǰəʔƛ̓umix^{w}	ǰɩ́ƛ̓ . ǰɛʔ . ƛ̓ò . mɩx^{w}	*car, vehicle*
e.	CəCPL-mač̓in	məč̓-mač̓in	mɩ́č̓ . ma . č̓ɩn	*lice*
f.	CəCPL-kapu	kəp-kapu	k^{y}ɩ́p . k^{y}æ . po	*lots of coats*

(142)



2.4.4.4 Interaction of Retraction and Place Assimilation

J.Davis (1970) and Urbanczyk (1999) state that schwa becomes [ɛ] when it occurs after an alveopalatal and before a laryngeal. As documented here in §2.4.4.6, when schwa occurs after an alveopalatal and before a plain uvular stop, it is realized variably as [ʌ ~ ɛ]. Blake (1992, 1995), and Watanabe (1994, 2000) make a slightly different claim in which schwa neutralizes with the low vowel /a/ before a laryngeal, and then, like /a/ assimilates to the preceding alveo-palatal yielding [ɛ]. The morphological status of the Root in question is taken here to be the deciding factor as to whether the vowel is underlyingly an /a/ or is a schwa. If the Root behaves as a Weak Root for morphological purposes, the surface [ɛ] is analyzed as schwa whereas if the Root were to behave as a Strong Root, then surface [ɛ] is analyzed as /a/. Recall that surface [ɛ] also comes from /i/ in the environment of a following post-velar consonant, but that the allophones of schwa are perceptually shorter in duration than the allophones of the full vowels.

Examples in which schwa is realized as [ɛ] are documented in (143). Notice that in each case both the alveopalatal and the following laryngeal ʔ belong to the same syllable. A comparison of the examples in (148.b-b'), repeated here as (143.d-e), shows that this is a necessary condition for assimilation.

(143)

	Input		**Output**	**Gloss**
a.	šm̓-it	šəʔmit	šɛ́ʔ . mɛt	*dried (stative)*
b.	hu čap CəCPL-ǰuʔ	hu čap ǰəʔ-ǰuʔ	hó . čɛp . ǰɛ́ʔ . ǰuʔ	*you (pl) go home*
c.	šʔt ga	šəʔt ga	šɛ́ʔt gʌ	*go upstairs*
d.	č̓ʔ=umix^{w}=tn	č̓əʔumix^{w}tən	č̓ó . ʔo . mɪx^{w} . tən	*rug on floor*
e.	č̓ʔ=nač=tn	č̓əʔnačtən	č̓ɛ́ʔ . nʌč . tɪn .	*small blanket to sit on*

The surface realization [ɛ] involves the rightward spread of DOR[-bk] and the leftward spread of PHAR given the present analysis, as in (144).

(144)

```
   š            ə      ʔ
   |            '      |
   PN           PN     PN
   |            / \    /
  DOR     DOR     PHAR
   |    \ /
  [hi]  [-bk]

        [šɛʔ]
```

The examples in (145.a-c) show that for some speakers Retraction takes precedence over the effect of a preceding alveopalatal, since schwa is realized as [ʌ] and not as [ɛ]. The examples in (145.d-f) show that schwa is realized as [ʌ] before a plain uvular, as in (131) above.

(145) [ʌ] in the environment before a plain post-velar

	Input		Output	Gloss
a.	č̓q	č̓əq	č̓ʌ́q	*robin*
b.	č̓x̌	č̓əx̌	č̓ʌ́x̌	*ripe, cooked, done*
c.	ǰq̓	ǰəq̓	ǰʌ́q̓	*smooth*
d.	pq	pəq	pʌ́q	*white*
e.	ƛ̓q̓	ƛ̓əq̓	ƛ̓ʌ́q̓	*rot*
f.	qx̌	qəx̌	qʌ́x̌	*many*

(146)

```
      č̓            ə       q
      |           o ______|
      PN                 PN
      |                  /\
     DOR            DOR PHAR
     / \
  [hi][-bk]
```

Height assimilation of schwa to the following alveopalatal (spread of DOR[hi]) occurs consistently, but the effect of the preceding labialized consonant on schwa varies across speakers, giving the surface variation recorded in (147.a-b). Again the tautosyllabic consonant which follows schwa exerts a stronger effect on the surface realization of this epenthetic nucleus than the preceding consonant does.

(147) different speakers

	Input		Different Speakers	Gloss
a.	k̓^{w}š-t	k̓^{w}əšt	k̓^{w}ʊšt ~ k̓^{w}ɩšt	*count s.t.*
b.	k̓^{w}š=uθin-m	k̓^{w}əšuθinəm	k̓^{w}ʊ́šoθènəm ~ k̓^{w}ɩ́šoθènəm	*to tell a joke*
c.	CəCPL-k^{w}n̓ay	k^{w}ən-k^{w}əʔnay	k^{w}ʊ́nk^{w}ɑʔnʌy ~ k^{w}ɩ́nk^{w}ɑʔnʌy	*lots of lids*

2.4.4.5 Translaryngeal Harmony

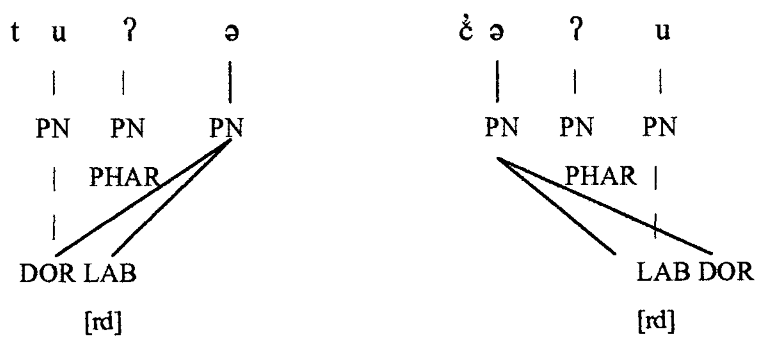
Not only is the surface realization of schwa determined by adjacent consonants, it can also be influenced by the quality of adjacent vowels. The example in (148.a) shows that schwa may be coloured by a preceding vowel, and that assimilation occurs across an intervening laryngeal. The example in (148.b) shows that translaryngeal harmony can also occur in the other direction; schwa becomes harmonic with a following vowel, and assimilation occurs across an intervening laryngeal.

(148)

	Input		Output	Gloss
a.	tg̓-ʔm-t-'uɬ č	túʔəmtùɬ č	túʔəmtòɬč ~ túʔomtòɬč	*I froze it for her*
b.	č̓ʔ=umix^{w}=tn	č̓əʔumix^{w}tən	č̓ó . ʔo . mɪx^{w} . tən	*rug on floor*
b'.	č̓ʔ=nač=tn	č̓əʔnačtən	č̓ɛ́ʔ . nʌč . tɪn .	*small blanket to sit on*
b''.	č̓ʔ-	č̓əʔ-	č̓ɛʔ-	*be on top of*

(149)

a. b.



2.4.4.6 Summary of Allophones of Schwa

The following table presents a summary of the allophones of schwa: C_1 indicates the place of articulation consonant which precedes schwa, and C_2 is used to indicate the place of articulation of the consonant which follows schwa. The dotted line (----) indicates that there are no clear examples in the present data base. The gap in (150) involves the plain velars in C_2 position, a position in which plain velars are severely limited in distribution (cf. Appendix IV). This is directly due to the fact that Proto-Salishan *k/k̓ were fronted to č/č̓ respectively. Examples of [k] and [k̓] within the synchronic grammar are loan words from either English or Chinook Jargon, or the neighbouring Wakashan language Kwakwala.

(150)

C_2 / C_1	LAB	COR	Alveopalatal	Velar	Labio-Velar	Uvular	Labio-Uvular	Glottal ʔ
LAB	ə́	ə́ ~ ʌ́	ə́	----	ə́ ~ ə́ʷ	ʌ́	ʊ́ ~ ɔ́	ɑ́
COR	ə́ ~ ʌ́	ə́ ~ ɩ́	ɩ́	ɩ́	ʊ́ ~ ú	ʌ́	ʊ́ ~ ɔ́	ɑ́
Alveopalatal	ɩ́	ɩ́ ~ ɛ́	ɩ́ ~ í	----	ʊ́ ~ ú	ʌ́ ~ ɛ́	ɔ́	ɛ́
Velar	ɩ́	ɩ́	ɩ́	----	ə́ʷ ~ ʊ́	ʌ́	ʊ́ ~ ɔ́	ɑ́
Labio-Velar	ʊ́	ʊ́	ɩ́ ~ ʊ́	----	ʊ́ ~ ó	ʌ́	ʊ́ ~ ɔ́	ɑ́
Uvular	ʌ́	ʌ́	əy [é·] ~ ʌ́	----	ʌ́	ʌ́	ɔ́ ~ ə́ʷ	ɑ́ ~ ʌ́
Labio-Uvular	ʌ́	ʌ́	ʌ́ ~ ə́	----	ə́ʷ ~ ó	ʌ́ ~ ɑ́	ɔ́	ɑ́
Glottal	ʌ́	ə́ ~ ʌ́	əy [í·]	ə́ ~ ʌ́	ʌ́	ʌ́	ʌ́	ɑ́

As we have observed, schwa retracts to [ʌ] in the environment of plain uvulars (PHAR DOR) whereas it retracts and lowers to a brief [ɑ] in the environment before glottal stop (PHAR). Retraction always takes place when schwa is adjacent to a post-velar consonant. Schwa is labialized when it precedes a labialized (i.e. [rd]) consonant. As seen from (147) above a preceding Labialized consonant does not tend to affect a following schwa to the same degree that a following labialized consonant does. Labialization spreads leftward but tends not to spread rightward (note the variability mentioned in §2.4.4.2). Labialization takes precedence over assimilation to a preceding alveopalatal (DOR[-bk]).

2.4.4.7 Proposed Analysis

The analysis proposed here follows from same constraints proposed for the Full Vowels /i, u, a/ and the fact that schwa lacks lexical feature specification.

When schwa is followed by a tautosyllabic laryngeal consonant ʔ, it is systematically lowered to [ɑ́]. Retraction to the low vowel [ɑ́] interacts with Labialization in the following way. Retraction from a following glottal seems to take precedence over rounding from a preceding labialized consonant. This not only shows that Retraction to [ɑ] outranks Labialization but underscores the fact that consonants which follow schwa seem to have a stronger effect than consonants which precede schwa. Notice that retraction to [ɑ] and Labialization are in conflict since there are no low rounded vowels in the language, as discussed in §2.4.3.2.1. Again this follows from the grounded constraint which states that if a vowel is DOR [lo], then it is not round. This is abbreviated as *LO/RD.

A preceding alveopalatal (DOR [hi, -bk]) can affect the height and place of articulation of schwa depending on the place features of the following consonant, as shown by the data in (143-145) above. Alveopalatals generally share their [hi] specification with a following schwa *except* when schwa is followed by a post-velar (PHAR) consonant. Since retraction of schwa in the environment of a following post-velar consonant (PHAR) seems to be categorical (that is, it always takes place), the failure of [hi] spread from a preceding alveopalatal consonants is analyzed as a high-ranking grounded constraint which states that if the vowel (in this case schwa) is PHAR, then it is not [hi] (*PHAR/HI). A preceding alveopalatal also shares its [-bk] specification with a following schwa *as long as* schwa is not followed by a tautosyllabic labialized consonant. In this case, rounding takes precedence over the spread of [-bk]. This is analyzed here as a grounded constraint which states that if a vowel is [rd], then it is not [-bk] (*RD/-BK). This constraint also captures the fact that Sliammon lacks front rounded vowels in its inventory.

It is not fortuitous that schwa colouration and the realization of the underlying full vowels show many parallels; in particular, Retraction and the effects of a preceding Alveopalatal. One question we might address here is why does schwa colouration also involve Labialization whereas the realization of the full vowels does not? This is explained in a straightforward manner given the lexical representation of the Full Vowels and the grounded constraints proposed above. Labialization can not occur to either /i/ or /a/ due to the grounded constraints *-BK/RD and *LO/RD. The effects of labialization on /u/ are not perceived since /u/ is lexically specified as LAB[rd] DOR. This observation is important since it provides us with a diagnostic for differentiating schwa (and the allophones of schwa) from a reduced full vowel. Full Vowel Reduction is discussed in the next section.

2.4.5 Reduced Full Vowels

The prosodic properties of Full Vowel Reduction in Sliammon will be discussed in detail in Chapter 4 where it will be argued that reduction is sensitive to stress. A full vowel is reduced in a closed unstressed (post-tonic) syllable in order to improve the resulting Foot structure (cf. §3.3 on Metrical Structure in Sliammon and §4.3 on Full Vowel Reduction). Representative data are presented here in (151) in which full vowels alternate with their lax counterparts.

(151) Full Vowel Reduction

	Input		Output	Gloss
a.	yax̌-t-anapi-as-'uɬ	yax̌-[a]t-anapi-s-uɬ	yɛ́ .x̌a .tà .na .pè . sɔɬ	*He was thinking of you*
a'.	yax̌-t-anapi č	yax̌-[a]t-anapi č	yɛ́ . x̌a . tà . na . pɪč.	*I remembered you (pl)*
b.	hi hw č x̌aƛ̓-ng-mi	hihiwč x̌aƛ̓numi	hɛ́:wč x̌áƛ̓ . no . me.	*I love you very much*
b'.	x̌aƛ̓-ng-mi č	x̌aƛ̓numič	x̌áƛ̓ . no . mɪč.	*I love you (sg)* [1]

[1]Notice that if this proposal is correct, then we have evidence that the first person subject clitic č *I* in these contexts is syllabified with the preceding object suffix and is therefore part of the Prosodic Word domain. This will become important in determining the position of clitics within prosodic and morphological domains (cf. Selkirk 1995 on the position of clitics, and Watanabe 2000 on clitics in Sliammon).

c. ʔawuk^{w}-hV č	ʔawu-hu-k^{w} č	ʔʌ́ . wo . hòk^{w}č	*I have tobacco*
c'. ʔawuk^{w}	ʔawuk^{w}	ʔá . wʊk^{w} ~ ʔʌ́wʊk^{w}	*tobacco*
d. t̓ug-θ-as	t̓ug-[u]-θ-as	t̓ó . gu . θʌs	*she recognizes me*
d'. t̓ug-t č	t̓ug-[ə]<t>č	t̓ó . gʊč	*I recognize her*
e. DIM-mix̌ał=uł	mi-m<i>x̌ałuł	mɛ́m . x̌a . łòł	*black bear cub*
e'. mix̌ał	mix̌ał	mɛ́ . x̌ʌł	*black bear*
f. ʔiłtan-hV č	ʔiłta-ha-n č	ʔɛ́ł . ta . hʌ̀nč	*I've got food*
f'. ʔiłtan	ʔiłtan	ʔɛ́ł . tʌn	*eat, food*
g. sup=nač-hV a	supna-ha-č a	sóp . na . hà . ča .	*Has he got a tail?*
g'. sup=nač	supnač	sóp . nʌč	*tail*

It is proposed that Full Vowel Reduction entails the loss of a mora associated with the Full Vowel, but that the full vowel retains its phonological features, following Blake (1999).

Traditionally, full vowel reduction is often treated as reduction to schwa; that is, the loss of a mora *and* the phonological features which it dominates. Within Optimality Theory, the constraints which govern the prosodic structure can be ranked independently from the constraints on featural Faithfulness. It therefore seems entirely feasible to "adjust" the prosodic representation (in this case underparse a mora <μ>) in order to create an optimal Foot without affecting the featural content which it dominates. In this way, constraint violation is minimal.

It seems important therefore to consider whether or not Full Vowel Reduction in Sliammon is the same as reduction to schwa. It is claimed here that the output of Full Vowel Reduction has the prosodic structure of schwa and the featural content of a full vowel. In order to see this, consider the representation of the three "types" of output vowels (schwa, full vowel and reduced full vowel) presented in (152).

(152)

Schwa	*Full Vowel*	*Reduced Full Vowel*
C Nuc C | ' | | ' | | o | | / \ | [f] [f]	Nuc | μ | [f]	Nuc | <μ> | [f]

Notice that the difference between the surface representation of schwa and the output of full vowel reduction is not whether or not the vowel has features (both do) rather *the source* of those features. The surface output of schwa is completely determined by the features associated with adjacent consonants (and vowels) whereas the output of Full Vowel Reduction retains its lexical featural content (DOR[-bk] for /i/ [ɩ], LAB [rd] DOR for /u/ [ʊ ~ ɔ], and DOR[lo] for /a/ [ʌ]). The height of the reduced full vowel is still determined by the height of the adjacent consonants; however, the lexical content of the reduced vowel prevents total place assimilation, in keeping with the grounded constraints and faithfulness, as discussed above.

2.4.5.1 Evidence that Full Vowel Reduction (laxing) ≠ Reduction to Schwa

The next section presents two cases which supports this claim. Basically, the quality of a reduced full vowel is distinct from the surface realization of schwa in a number of contexts.

The first case involves what happens to unstressed /i/ when it is followed by a labialized consonant (C^w). If full vowel reduction were the loss of a mora *and the phonological features associated with this vowel*, then we would expect the surface reduced vowel (i.e. the Output) to be identical to schwa in the same context. The data in (153.a'-c') shows that schwa is rounded before a labialized consonant whereas (153.a"-c") Column 3 shows that schwa does not surface as a mid central unrounded vowel [ə] in this context.

(153) Schwa Colouration

	Input		Output	Gloss
a.	q̓ʷx̌-t ga tə qigaθ	q̓ʷəx̌t	q̓ʷʌ́x̌t ~ q̓ʷɑ́x̌t	*butcher the deer!*
a'.	IMP-q̓ʷx̌-t čan	q̓ʷə-q̓ʷx̌t čən	q̓ʷɔ́q̓ʷx̌tᵊ čɩn	*I'm butchering it*
a".			*q̓ʷə́q̓ʷx̌tᵊ čɩn	
b.	nxʷiɬ	nəxʷiɬ	nʊ́xʷɩɬ ~ núxʷɩɬ	*dugout canoe*
b'.	CəCPL-nxʷiɬ	nəxʷ-nəxʷiɬ	nʊ́xʷnʊxʷɛɬ	*canoes*
b".			*nə́xʷnʊxʷɛɬ	
c.	DIM-ƛ̓x̌ʷ=ay+[ʔ]	ƛ̓i-ƛ̓x̌ʷay̓	ƛ̓ɩ́ƛ̓x̌ʷʌy̓	*small chum salmon*
c'.	ƛ̓x̌ʷ=ay	ƛ̓əx̌ʷay	ƛ̓ɔ́x̌ʷʌy	*chum, dog salmon*
c".			*ƛ̓əx̌ʷʌy	

Contrast this with the following data in (154) which shows unstressed /i/ [ɛ / ɩ] in the same phonological context (i.e. before a labialized consonant). Notice that reduced /i/ surfaces as [ɛ / ɩ], and crucially does not surface as [ɔ / ʊ], as shown by the starred (*) forms in (154.a'-e').

(154) Full Vowel Reduction /i/ [ɛ/ɩ]

	Input	V-reduction <μ>	Output	Gloss
a.	masiqʷ	(má$_{\mu}$. siqʷ$_{<\mu>\mu}$)	má·sɛqʷ	*purple sea urchin*
a'.		*ma . səqʷ	*masɔqʷ	
b.	t̓ᶿip̓=iqʷ	(t̓ᶿí$_{\mu}$. p̓iqʷ$_{<\mu>\mu}$)	t̓ᶿɛ́·p̓ɛqʷ	*pointed nose*
b'.		*t̓ᶿi . p̓əqʷ	*t̓ᶿɛ́p̓ɔqʷ	
c.	ƛ̓iq̓iw	(ƛ̓í$_{\mu}$. q̓iw$_{<\mu>\mu}$)	ƛ̓ɛ́q̓ɛw	*dark*
c'.		*ƛ̓i . q̓əw	*ƛ̓ɛ́q̓əw	
d.	tiqiw	(tí$_{\mu}$. qiw$_{<\mu>\mu}$)	tɛ́qɛw	*horse*
d'.		*ti . qəw	*tɛ́qəw	
e.	ʔiʔagik̓ʷ	(ʔí$_{\mu}$. ʔa$_{\mu}$. gik̓ʷ$_{<\mu>\mu}$)	ʔɛ́ʔagɩk̓ʷ	*clothes*
e'.		*ʔi . ʔa . gək̓ʷ	*ʔɛ́ʔagʊk̓ʷ	

The grounded constraints posited to explain the full vowel allophones §2.4.3 and the output of schwa colouration §2.4.4, also provide an explanation for why reduced /i/ [ɛ / ɩ] fails to undergo rounding. Since /i/ is lexically specified DOR[-bk], place assimilation and consonant-vowel interaction is subject to the grounded constraint *-BK/RD which states that if a vowel is [-back], then it is not round. Reduction, which is construed as the underparsing of a mora (Max[μ] violation), does not affect the correspondence relations of the features it dominates. Since schwa lacks inherent place features, it is free to undergo Labialization, thus explaining the observed contrast between the Output of Full Vowel Reduction and Schwa Colouration.

The second case which shows that the Output of Full Vowel Reduction is distinct from schwa colouration involves /u/ in an unstressed syllable between adjacent coronals, and a comparison with schwa in the same phonological context. Consider the realization of schwa between coronals. As shown by the data in (155) schwa is realized as [ə́ ~ ɩ́].

(155)

	Input		Output	Gloss
a.	CəCPL-saƚtxʷ	səƚ-saƚtxʷ	sɩ́ƚsaƚtxʷ	*women*
b.	CəCPL-t̓in̓iqʷ	t̓ən-t̓iʔniqʷ	t̓ə́nt̓ɛʔnɛqʷ	*salmonberries*

If full vowel reduction of /u/ were reduction to schwa (i.e. a bare nucleus), then we would expect it to surface as [ə́ ~ ɩ] between coronals. The data in (156) shows that this is not the case. Reduced /u/ is realized as [ʊ ~ ɔ] in keeping with the proposed analysis; crucially it retains its inherent DOR [rd] specification.

(156) Reduced /u/ [ɔ ~ ʊ]

	Input		Output	Gloss
a.	ǰas-'uɬ	ǰasuɬ	ǰɛ́sɔɬ	*yesterday*
a'.		*ǰasəɬ	*ǰɛ́sɪɬ , *ǰɛ́səɬ	
b.	ƛpx^w-t-'uɬ č	ƛəpx^{w}atʊɬč	ƛə́px^{w}atʊɬč	*I broke it*
b'.		*ƛəpx^{w}atəɬč	*ƛəpx^{w}atɪɬč	
b".		*ƛəpx^{w}atəɬč	*ƛəpx^{w}atəɬč	
c.	k̓^{w}un̓ut̓	k̓^{w}uʔnut̓	k̓^{w}óʔnɔt̓	*porpoise*
c'.		*k̓^{w}uʔnət̓	*k̓^{w}óʔnət̓	
d.	x̌at̓^{θ}-θut	x̌at̓^{θ}θut	x̌ɑ́t̓^{θ}θɔt^h	*fit* (clothes)
d'.		*x̌at̓^{θ}θət	*x̌ɑ́t̓^{θ}θət, *x̌ɑ́t̓^{θ}θɪt	

The explanation is parallel to the one presented above. When moras are parsed into Feet they are subject to constraints on well formedness, in particular Foot Binarity at the moraic level (FTBINμ). The constraint conflict therefore is between the pressure to parse moras (Max[μ]) into well-formed Feet, and to construct Feet which obey Foot Binarity. Since the constraint conflict is of a prosodic nature, additional violations of Faithfulness (i.e. the loss of phonological features) will always entail non-minimal violation of the constraint hierarchy. In the case of /u/, the loss of the features DOR[rd] would involve exactly these kind of non-minimal violations. The resulting candidate would have more constraint violations, and therefore be less optimal than a candidate which incurs minimal violations (just enough in order to satisfy the constraint ranking). Consider the following tableau which illustrates this point.

(157) ǰasuɬ [ǰɛ́sɔɬ] *yesterday*

Input: ǰa$_\mu$. su$_\mu$ɬ$_\mu$ | DOR [rd]	FTBINμ	FAITH [f]	MAX[μ]
☞ a. (ǰá$_\mu$. sɔɬ$_\mu$) | DOR [rd]			*
b. (ǰá$_\mu$. su$_\mu$ɬ$_\mu$) | DOR [rd]	*!		
c. (ǰá$_\mu$. səɬ$_\mu$)		*!**	*

This is illustrated briefly here to show that the output of Full Vowel Reduction is distinct from Schwa Colouration. Detailed discussion and analysis of the prosodic properties of Full Vowel Reduction will be presented in Chapter 4.

Chapter 3: Prosodic Structure of Sliammon

Raven did not come on Thursday, He sent nothing.
Not a word. Not a sign.
Nothing on Thursday. Nothing on Friday.
Nothing on Saturday. Nothing on Sunday.
Then he sent eagles.
Phyllis Webb

3.0 Introduction

This chapter is a pivotal chapter. It provides additional evidence for a phonological weight contrast between the full vowels and schwa, thus confirming the hypothesis made in Chapter 2, and it motivates the prosodic structures which will be assumed in Chapters 4 and 5. Arguments regarding the moraic structure of the language are presented in §3.1. §3.2 introduces the basic syllable-structure constraints, and §3.3 is a brief introduction to Sliammon metrical structure.

Kenstowicz (1993), and Blevins (1995) both summarize the central role of the syllable within linguistic theory. Speech sounds are not simply ordered with respect to one another in accordance with the constraints on possible sequencing; rather speech sounds are proposed to be organized into higher prosodic units of Mora (μ), Syllable (σ), Foot (Ft), and Prosodic Word (PrWd), following Selkirk (1980a, 1980b), McCarthy and Prince (1986 et seq.). The modified version of the Prosodic Hierarchy which is adopted here is presented in (1), and re-introduces the Nucleus (N) as a linguistic prime, following work by Shaw (1992, 1993, 1995, 1996).

(1) Prosodic Hierarchy

PrWd
|
Ft
|
σ
|
N
|
μ

Shaw (1995, 1996) provides the syllable typology in (2):

(2) Nuclear Moraic Model of Syllable Structure (Shaw 1993, 1995, 1996)

```
Super-light   Light         Light         Heavy       Heavy       Super-heavy
non-moraic    mono-moraic   mono-moraic   bi-moraic   bi-moraic   tri-moraic

a.            b.            c.            d.          e.          f.
     σ              σ             σ            σ           σ            σ
    /|             / |           /|           /|          /|\          /|\
   /N             / N           / |          /N          /N \         /N \
  / |            /  |          /  |         / /\        / |  \       / /\ \
 /  |           /   μ         /   μ        /  μ μ      /  μ   μ     /  μ μ μ
/   |          /    |        /    |       /   \/      /   |   |    /   \/  |
C  [ə]         C    V        C    C       C   V:      C   V   C    C   V:  C
```

This model allows for super-light syllables which are characterized as Nuclear but non-moraic (=2.a). The model also groups mono-moraic nuclear CV syllables (2.b) together with the mono-moraic non-nuclear CC syllables in (2.c). Although they differ in the presence/absence of a vocalic Nucleus, the claim made by this model is that they behave in a similar fashion with respect to their phonological weight. The non-nuclear syllables such as the ones in (2.c) provide a representation for obstruent-only syllables; these are also referred to as 'Minor Syllables', following Sloan (1988), Shaw (1996.a, 1996.b). As will be shown in §3.2, Sliammon has minor syllables at the right-edge of the word. The reader is also referred to Shaw (1996.a) on Minor Syllables in Lillooet and Bella Coola, and to Bates and Carlson (1997) on Minor Syllables in Spokane (Salish).

This model also predicts mono-moraic syllables of following form, following Shaw (1996.b):

(3)

```
Light: mono-moraic
a.       σ
        /|\
       / N \
      /  |  \
     /   |   μ
    /    |   |
   C    [ə]  C
```

The structure in (3) represents a mono-moraic closed syllable which contains a non-moraic Nuclear schwa and a moraic coda consonant. Schwa most often occurs in this configuration, as discussed in detail in Chapter 5.

If schwa is weightless, and syllables are maximally bi-moraic, then we may also expect to find evidence for bi-moraic syllables of the form in (4). (cf. Shaw (1996b) who questions whether or not schwa can license a complex coda.)

(4)

Heavy: bi-moraic

a.

```
        σ
      /| \\
     / N \ \
    /  |  μ μ
   /   |  | |
  C   [ə]  C C
```

As will be shown in §3.2, both CəC and CəCC syllables are attested in Sliammon. What is of particular interest is the fact that Sliammon exhibits a constraint against trimoraic CACC syllables whereas CəCC syllables are attested. This contrast provides additional evidence for the hypothesis that schwa is Nuclear and non-moraic whereas the full vowels /i, u, a/ are Nuclear and moraic.

3.1 Moraic Structure

Within this model, the mora (μ) is the basic unit of phonological weight in keeping with a growing body of literature (Hyman (1985), Hayes (1995), Zec (1988), Bagemihl (1991), Pulleyblank (1994), amongst others). Pulleyblank (1994) presents arguments that moras are present in the Input rather than assigned by weight-by-position (cf. Hayes 1995).

It will be argued in this section that Sliammon displays a contrastive weight distinction. In particular, schwa is weightless whereas the full vowels /i, u, a/ are mono-moraic. For example, Weak Roots of the shape CəC are proposed here to be mono-moraic whereas Strong Roots of the shape CAC are bimoraic. (Recall that "A" in CAC stands for a full vowel). The independent existence of Compensatory Lengthening (CL) in the language motivates preservation of underlying moraic structure and provides evidence that coda consonants are moraic (cf. Hayes 1989 on CL; Blake 1992 on CL in Sliammon).

The goal of §3.1.1 is to establish the fact that coda consonants in Sliammon are moraic. Once this point has been established, §3.1.2 shows that CəC syllables behave differently than CAC syllables. Since there is evidence that a single post-vocalic coda consonant is moraic, then this difference in behaviour is therefore attributed to a difference in phonological weight of the vowel; schwa is weightless whereas the full vowels /i, u, a/ are mono-moraic. This corroborates the claim made in Chapter 2 where it was noted that schwa is shorter in duration than the full vowels. The hypothesis that all post-vocalic coda consonants are moraic is central to the discussion of the constraints on the distribution of schwa which will be developed in detail in Chapter 5.

3.1.1 Coda consonants are Moraic

The purpose of this section is to show that post-vocalic coda consonants are moraic in Sliammon. Evidence is presented from Compensatory Lengthening facts §3.1.1.1, Stress assignment and Full Vowel Reduction §3.1.1.2, and the stress properties of the Stative suffix -it §3.1.1.3. The conclusion that coda consonants are moraic in the language finds additional confirmation from judgements regarding prosodic constituency provided by speakers of Sliammon in §3.1.1.4.

3.1.1.1 Compensatory Lengthening

As shown by the data in (5) and following Blake (1992), the loss of a syllable-final glottal [ʔ] gives rise to Compensatory Lengthening of the preceding full vowel nucleus, following Blake (1992). The relevant syllable is underlined in (5) Column 3. Although the data in (5.c-d) show that two variants appear to be in free variation, the existence of vowel lengthening provides evidence for the moraic status of the coda consonant.

(5) Compensatory Lengthening: loss of ʔ

	Input		Output	Gloss
a.	gaʔ-gaʔt̓ᶿap	gaʔgaʔt̓ᶿap	gáʔ.gaʔ.t̓ᶿʌpʰ	*he's gone driving*
a'.	gaʔt̓ᶿap	gaʔt̓ᶿap	gá:t̓ᶿʌpʰ	*drive, steer*
b.	x̌ʷat̓ᶿ=iqʷ=uj̓a	x̌ʷat̓ᶿiqʷuʔǰa	x̌ʷʌ́ . t̓ᶿɛ .qʷòʔ . ǰɛ	*joint* (human body)
b'.	x̌ʷat̓ᶿ=iqʷ=uj̓a	x̌ʷat̓ᶿqʷuʔǰa	x̌ʷʌ́t̓ᶿ. qʷò:ǰɛ	*wrist*
c.	tẏ̓ta	tiʔta	tíʔtʌ ~ tí:tʌ	*that one* (gen.)
d.	θẏ̓θa	θiʔθa	θíʔθʌ ~ θí:θʌ	*that one* (fem)

Loss of syllable-final [h] also gives rise to Compensatory Lengthening, as in (6). The morphologically related forms show that the Root is h-final.

(6) Compensatory Lengthening: loss of h

	Input		Output	Gloss
a.	tih	tih	tíh ~ tí:	*big*
a'.	tih=us	tihus	tíhos	*big head*
a".	tih=iqʷ	tihiqʷ	tíhɛqʷ	*big nose*
a'".	IMP-tih-INC	ti-tih-ih	títihɛ̀h	*it is getting big*
b.	IMP-puh-INC	pu-puh-uh	púpuhuh	*it is getting windy*
b'.	puh-ʔm	puhʔəm	púhʔʌm ~ pú:ʔəm	*to blow (wind)*
b".	puh-ʔm[i]	puhʔim	púhʔɛm ~ pú:hɛm	*it's windy* (state)
c.	ʔah	ʔah	ʔah	*be hurt, sore*
c'.	ʔah-stg	ʔahsxʷ	ʔá:sxʷ	*hurts*
c".	ʔah-stg č	ʔahsxʷ č	ʔá:sxʷč	*I'm hurt*

A third context illustrating Compensatory Lengthening entails the loss of a final n in the environment before t, or θ, as shown by the data in (7.a-b). The form in (7.c) shows that the Lexical Suffix (LS) =iq^{w}an *head* is n-final.

(7) Compensatory Lengthening: loss of n

	Input	n-deletion	Output	Gloss
a.	sṗ=iq^{w}an-θ-as	sə́ʔṗiq^{w}à<n>θas	sə́ʔṗɛq^{w}à:θʌs	*he hit me on the head*
b.	x̌im=iq^{w}an-t-m	x̌ímiq^{w}à<n>təm	x̌ɛ́meq^{w}à:təm	*get clawed in the head*
c.	np=iq^{w}an	nə́piq^{w}an	nə́pɛq^{w}ʌn	*brain*

To summarize, the loss of a syllable-final {ʔ, h, n} causes Compensatory Lengthening, and therefore provides evidence that post-vocalic syllable-final consonants are moraic. Since h is a fricative, and n patterns with the class of Resonants, the hypothesis made here is that all coda consonants are moraic in Sliammon, following Blake (1992). This is illustrated by the Input/Output representations in (8).

(8)

Input $\qquad\qquad\qquad$ Output

$$\begin{array}{ccc} & \mu & \mu \\ & | & | \\ C & V & C \end{array} \quad \rightarrow \quad \begin{array}{cc} & \mu \;\; \mu \\ & \backslash \; / \\ C & V: \end{array}$$

It should also be noted that Compensatory Lengthening seems to be restricted to stressed syllables. One may also wonder why Compensatory Lengthening does not take place more frequently than it does. Since many cases of consonant deletion (Coronal deletion: n-deletion, t-deletion, ɬ-deletion cf. §2.2.7.2) occur in order to reduce the phonological weight of the syllable in question, conservation of the moraic structure via Compensatory Lengthening is non-optimal in these contexts. Furthermore, as will be argued in Chapter 4 there is a high-ranking constraint

PEAK PROM FT which ensures that the phonological weight of the head of the Foot is greater than or equal to the phonological weight of the non-head. Conservation of moraic structure in an unstressed syllable would therefore cause a violation of this constraint.

3.1.1.2 Stress Assignment and Vowel Reduction

One of the central claims made in Chapter 4 is that Full Vowel Reduction occurs in unstressed closed syllables in order to reduce the phonological weight of the non-head. The proposed analysis of the stress facts and of Full Vowel Reduction entail that coda consonants are moraic, as shown by the data in (9.a-d). The brackets in the Output indicate the foot structure: a period is used to indicate syllable boundaries, and μ indicates the moraic status of each segment. The data in (9.a'-d') provides morphologically related forms which provide evidence for the representations assumed here.

(9)

	Input		Output	Gloss
a.	saL'=awus	saʔa[ʔ]awus	(sá$_{\mu}$ʔa$_{\mu}$) (ʔà$_{\mu}$wʊs$_{\mu}$)	*two eyes*
a'.	saL'	saʔa	sáʔa	*two*
b.	ƛ̓ip=awus	ƛ̓ipawus	(ƛ̓é$_{\mu}$. pa$_{\mu}$. wʊs$_{\mu}$)	*area below the eye*
b'.	ƛ̓ip	ƛ̓ip	ƛ̓ɛ́p	*under*
c.	ƛ̓ax̌=ay	ƛ̓ax̌ay	(ƛ̓á$_{\mu}$. x̌ʌy$_{\mu}$)	*elder* (most respectful)
c'.	DIM-ƛ̓ax̌=ay+[ʔ]	ƛ̓aƛ̓x̌aỷ	ƛ̓áƛ̓x̌ʌỷ ~ ƛ̓áƛ̓x̌aỷ	*old person*
c''.	IMP-ƛ̓ax̌-INC	ƛ̓a-ƛ̓ax̌-ax̌	(ƛ̓á$_{\mu}$. ƛ̓a$_{\mu}$. x̌ʌx̌$_{\mu}$)	*getting old*
d.	k̓^{w}uyuk^{w}	k̓^{w}uyuk^{w}	(k̓^{w}ú$_{\mu}$ yʊk$^{w}{}_{\mu}$)	*fish hook, troll*
d'.	IMP-k̓^{w}uyuk^{w}-m	k̓^{w}u-k̓^{w}uyuk^{w}-əm	k̓^{w}úk̓^{w}oyùk^{w}ʊm	*trolling*

If coda consonants were non-moraic, then there would need to be a different explanation for what drives Full Vowel Reduction.

3.1.1.3 Stative -it

The special stress behaviour of the stative morpheme provides evidence that this suffix is bimoraic: -$i_{\mu}t_{\mu}$. Consider the data in (10) which show that the stative always bears secondary stressed when it follows a Strong Root of the form CAC. This fact is noted and discussed in detail in Watanabe (2000). What is of interest here is that the final CAC syllable is stressed, and resists reduction, as shown by the contrast between the grammatical examples in (10.a-d) and the ungrammatical examples in (10.a'-d').

(10) Stative

	Input	μ-conservation	Output	Gloss
a.	x̌ʷu$_{\mu}$q̓ʷ$_{\mu}$ - i$_{\mu}$t$_{\mu}$	x̌u$_{\mu\mu}$. q̓ʷi$_{\mu}$t$_{\mu}$	(x̌ʷǿ:) (q̓ʷɛ̂tʰ)	*s.o. snoring (state)*
a'.			*(x̌ʷǿq̓ʷɛt)	
b.	hu$_{\mu}$ y̌$_{\mu}$ - i$_{\mu}$t$_{\mu}$	hu$_{\mu\mu}$. y̌i$_{\mu}$t$_{\mu}$	(hǿ:) (y̌ɪt)	*already done*
b'.			*(hǿy̌ɪt)	
c.	ta$_{\mu}$ p$_{\mu}$ - i$_{\mu}$t$_{\mu}$	ta$_{\mu\mu}$. pi$_{\mu}$t$_{\mu}$	(tá:) (pɛ̀tʰ)~(tá:)(pɛ̀tʰ)	*tight*
c'.			*(tápɛt)	
d.	t̓ᶿa$_{\mu}$ y̌̓$_{\mu}$ - i$_{\mu}$t$_{\mu}$	t̓ᶿa$_{\mu}$ʔ$_{\mu}$. y̌i$_{\mu}$t$_{\mu}$	(t̓ᶿá:) (y̌ɪtʰ)~(t̓ᶿáʔ)(y̌ɪtʰ)	*shade*
d'.			*(t̓ᶿáʔy̌ɪt)	

The fact that the stative bears secondary stress and resists full vowel reduction suggests that it is lexically footed (cf. Shaw et.al. 1999). Lengthening of the Root vowel preserves the bimoraic status of the initial syllable, since the Root-final consonant is parsed as an Onset to the stative suffix -it, as shown in (10.a-c). The second variant in (10.d) shows that the phonological weight of the second consonant of the Root is preserved when a vowel-initial suffix is added. The glottal portion [ʔ] of y̌̓ continues to occupy the coda of the first syllable, and the y̌ functions as the Onset to the second syllable. This satisfies the Onset constraint while also being Faithful to the moraic structure of the Root, as shown by the Foot structure in (11).

(11) Input: t̓$^{\theta}$a$_{\mu}$ǰ̓$_{\mu}$ - i$_{\mu}$t$_{\mu}$ Output: [t̓$^{\theta}$áʔǰ̆it^{h}] *shade*

```
         FT               FT
         σ                σ
        /|\              /|\
       / N \            / N \
      /  |  \          /  |  \
     /   μ   μ        /   μ   μ
    /    |   |       /    |   |
  t̓θ     a   ʔ      ǰ̆     i   t
```

This kind of conservation of moraic structure provides evidence that post-vocalic consonants are moraic, and that the moraic content of Roots is present in the Input. Restructuring of glottalized resonants is discussed further in §5.2. See Appendix V for a list of Strong and Weak Roots in Sliammon.

3.1.1.4 Moraic Structure: Speaker Judgements

Additional confirmation that coda consonants are moraic comes from judgements regarding sub-syllabic constituency provided by speakers of the language. One elder consistently provides moraic units when asked to divide words into "syllables". She often taps out the number of rhythmic beats for each word. It is clear from a comparison of other forms syllabified by other speakers, and from syllable-sensitive processes in the language such as the vowel/glide/obstruent alternations discussed in §2.2.4, that the prosodic constituents provided by this speaker are smaller than a syllable. The fact that these are moraic-sized units is inferred by a comparison of a large number of forms which were morafied by this speaker. Relevant data was collected over a two year period and carefully compared with the judgements given by other speakers. A comparison of related data also enables us to rule out (a) morpheme-by-morpheme breakdown, (b) counting vowels, or (c) counting consonants as a possible interpretation of this speaker's judgements. A sample of the clearest data is presented in (12-13) below.

(12)

	Input	Moraic Structure	Output	Gloss
a.	tk̓^{w}-t	tək̓$^{w}_{\mu}$ t$_{\mu}$	tʊ́k̓^{w}t^{h}	*pull it (cedar root)*
b.	px̌-t	pə́x̌$_{\mu}$ t$_{\mu}$	pʌ́x̌t^{h}	*tear s.t.*
c.	ʔsp̓	ʔəs$_{\mu}$ p̓$_{\mu}$	ʔə́sp̓	*finished*
d.	plk^{w}-t	pə́l$_{\mu}$ k^{w}ət$_{\mu}$	pə́lk^{w}ət^{h}	*roll it*

(13)

	Input	Moraic Structure	Output	Gloss
a.	x̌it̓$^{\theta}$	x̌i$_{\mu}$ t̓$^{\theta}_{\mu}$	x̌ɛ́t̓$^{\theta}$	*iron, metal*
b.	x^{w}ip-t	x^{w}i$_{\mu}$ pət$_{\mu}$	x^{w}ɪ́pɪt^{h}	*sweep it*
b'.	x^{w}ip-ʔamin	x^{w}ɪ́ $_{\mu}$p$_{\mu}$ ʔà$_{\mu}$ mɪn$_{\mu}$	x^{w}ɪ́pʔàmɪn	*duster, brush*

These judgements regarding moraic structure provide further evidence for the non-moraic status of schwa. Compare (12.a) with (13.a) for example. The word tək̓^{w}t *pull it* is parsed prosodically as tək̓$^{w}_{\mu}$ t$_{\mu}$ not *tə$_{\mu}$k̓$^{w}_{\mu}$. t$_{\mu}$. If the initial CəC were bimoraic tə$_{\mu}$k̓$^{w}_{\mu}$, then it would be morafied in a similar fashion to the first two moras in (13.a): x̌í$_{\mu}$t̓$^{\theta}_{\mu}$. However, this is not the case. This kind of contrast provides additional evidence that schwa is non-moraic in these examples.

The data in (14) provides further evidence for the moraic status of post-vocalic consonants.

(14)

	Input	Moraic Structure	Output	Gloss
a.	čapθ	ča$_{\mu}$ p$_{\mu}$ θ$_{\mu}$	čɛ́pθ	*aunt, uncle*
b.	k̓^{w}aq̓t	k̓^{w}á$_{\mu}$ q̓$_{\mu}$ t$_{\mu}$	k̓^{w}áq̓t^{h}	*holler, scream*
c.	IMP-t̓$^{\theta}$k̓-it	t̓$^{\theta}$ɪ́ $_{\mu}$ t̓$^{\theta}_{\mu}$ k̓^{y}i$_{\mu}$ t$_{\mu}$	t̓$^{\theta}$ɪ́t̓$^{\theta}$k̓^{y}it^{h}	*they're all screaming*
d.	p̓l̓asč̓an̓	p̓ə́ʔ$_{\mu}$ ləs$_{\mu}$ č̓à$_{\mu}$ n̓$_{\mu}$	p̓áʔ^{ə}lʌsč̓ɛ̀n̓	*cone of tree (pine, fir)*

3.1.1.5 Onset consonants are non-moraic

Onsets are non-moraic as seen from the data in (15), in keeping with the cross-linguistic generalization that Onsets do not contribute to the phonological weight of the syllable (cf. Hayes 1995).

(15)

	Input	Output	Gloss
a.	k̓ʷaǰ-θut-'uɬ a čxʷ	k̓ʷáǰɛθòtoɬæ̀čxʷ	*Did you suffer?*
a'.	(k̓ʷá$_\mu$. ǰa$_\mu$)(θò$_\mu$. to$_\mu$)(ɬæ̀$_\mu$. čxʷ$_\mu$)		6 moras; 3 Feet
b.	IMP-gasx̌-ʔm[i]+[ʔ] a čxʷ	gágʌsx̌ɛ̀ʔɛmʌ̀čxʷ	*Are you making lot of noise?*
b'.	(gá$_\mu$. gʌs$_\mu$)(x̌ɛ̀$_\mu$. ʔɛ$_\mu$)(mʌ̀$_\mu$. čxʷ$_\mu$)		6 moras; 3 Feet

If following Hyman (1985), all consonants and vowels are moraic in the underlying representation, then satisfaction of the undominated constraint which requires that all syllables have Onsets in the language will be ranked higher than MAX[μ], the constraint which keeps track of correspondence violations. In particular, a mora which is present in the Input but is absent in the Output incurs a MAX[μ] violation, following McCarthy and Prince (1995 on Correspondence).

3.1.2 Moraic status of Vowels

The data in §3.1.1 establishes that coda consonants are moraic. Now consider the moraic status of the vowels. The following section presents evidence from Stress Assignment in the language which shows that schwa behaves differently than the full vowels /i, u, a/. This difference in behaviour is captured by their difference in phonological weight: schwa is non-moraic whereas the full vowels are moraic, thus providing independent confirmation of the hypothesis made in Chapter 2, and additional support for the Nuclear Moraic Model of Shaw (1993 et seq.).

3.1.2.1 Long vowels are bimoraic

Recall that surface long vowels are derived in Sliammon via Compensatory Lengthening. Long vowels are represented as bimoraic, in keeping with standard assumptions of Moraic Theory.

(16) Compensatory Lengthening

	Input	Output 1	Output 2	Gloss
a.	tỷta	tíʔta	tí:ta ~ tí:tʌ	*that one* (gen.)
b.	θỷθa	θíʔθa ~ θέʔθa	θí:θa	*that one* (fem.)
c.	məʔ-t-as	máʔtʌs	má:tʌs	*he got it*

(17)

```
NUC
 /\
μ μ
 \/
 V:
```

The data in (18.a'-c') shows that Strong Roots of the form CAC retain their bimoraic status with the addition of a bisyllabic Lexical Suffix.

(18)

	Input		Output	Gloss
a.	$ti_{\mu}h_{\mu}$	tih	tíh ~ tí:	*big*
a'.	tih=uθin	tihuθin	tí:hòθɛn	*big mouth*
b.	$q^{w}u_{\mu}p_{\mu}$-	q^{w}up-	q^{w}op-	*body hair*
b'.	q^{w}up=iθx̌an	q^{w}upiθx̌an	q^{w}ó:pèθx̌ʌn	*hair under arms*
b".	q^{w}up=uθin	q^{w}upuθin	q^{w}ó:pòθɛn	*beard, facial hair*
c.	$q̓^{w}i_{\mu}t_{\mu}$	$q̓^{w}$it	$q̓^{w}$έt	*beach*
c'.	$q̓^{w}$it=ax̌an	$q̓^{w}$itax̌an	$q̓^{w}$έ:tàx̌ʌn	*front of house*

As shown by the autosegmental representation in (19), the second consonant of the Root functions as the Onset to the vowel-initial Lexical Suffix, and the full vowel of the Root is lengthened in order to maintain the bimoraic status of the Root.

(19) /tih=uθin/ [tí:hòθɛn] *big mouth*

```
        FT                 FT
        σ           σ          σ
       / |         /|        / | \
      /  N        / N      /  N \
     /   μ μ     /  μ     /   |  μ
    /    \/     /   |   /     |  |
   t     i:    h    o   θ     ɛ  n
```

Both feet satisfy Foot Binarity at the level of the mora (FTBINμ) and therefore also satisfy Minimality. This results in a surface candidate which has adjacent stresses: (σ́)(σ̀ σ).

3.1.2.2 Full vowels are moraic

The stress facts in (20) also provide evidence that coda consonants are moraic in Sliammon since the bisyllabic word [t̓^{θ}ít̓^{θ}k̓^{y}it^{h}] *they're all screaming* bears secondary stress.

(20)

	Input	Output	Gloss
a.	IMP-t̓^{θ}k̓-it	t̓^{θ}ít̓^{θ}k̓^{y}it^{h}	*they're all screaming*
a'.	(t̓^{θ}í$_{\mu}$t̓^{θ}$_{\mu}$) (k̓^{y}ì$_{\mu}$t$_{\mu}$)		2 feet, 4 moras

If moras are grouped together in a binary fashion in order to form trochees, then CAC . CAC is quadra-moraic and consists of two feet. If coda consonants were non-moraic, then we would predict a single bimoraic foot: (t̓^{θ}í$_{\mu}$t̓^{θ} . k̓i$_{\mu}$t), and not *(t̓^{θ}í$_{\mu}$t̓^{θ}$_{\mu}$) (k̓ì $_{\mu}$t$_{\mu}$).

3.1.2.3 Schwa is non-moraic

Compare the behaviour of the full Vowels in (20) with the behaviour of schwa in (21). As shown by the data in (21), two adjacent CəC syllables form a single foot. If schwa were moraic then the output in (21) should be parallel to the stress facts in (20) above. This is not the case, as shown by the ungrammatical examples in (21.a"-b").

(21)

	Input	Output	Gloss
a.	č̓m-č̓m̓ tə q̓ya	č̓ímč̓ɩm̓ t^{ə} qáʔ^{ə}yɛ	*the water is cold*
a'.		(č̓ə́m$_{\mu}$. č̓əm̓$_{\mu}$)	
a".		*(č̓ə́$_{\mu}$m$_{\mu}$) (č̓ə̀$_{\mu}$m̓$_{\mu}$)	*4 moras
b.	pq-pq	pʌ́q^{h}pʌq^{h}	*all white*
b'.		(pə́q$_{\mu}$. pəq$_{\mu}$)	
b".		*(pə́$_{\mu}$q$_{\mu}$) (pə̀$_{\mu}$q$_{\mu}$)	*4 moras

The goal of this section has been to present additional evidence which shows that schwa is distinct from the full vowels /i,u ,a / in terms of its phonological weight. This provides additional support that schwa is non-moraic (weightless) whereas the full vowels /i, u, a/ are mono-moraic. This hypothesis has implications which are explored in the subsequent section.

3.1.3 Implications: CC Roots and Minimality

3.1.3.1 The Problem

Words in Sliammon can be long involving complex affixation and reduplication; however, there are also restrictions on the minimal size of free-standing lexical items.

McCarthy and Prince (1993: 44) provide the following explanation of the derived notion Minimal Word:

(22)

> *The prosodic hierarchy and Foot Binarity, taken together, derive the notion "Minimal Word" (Prince 1980, Broselow 1982, McCarthy and Prince 1986, 1990a, 1991a, 1991b). According to the Prosodic Hierarchy, an instance of the category Prosodic Word (PrWd) must contain at least one Foot (Ft). By Foot Binarity, every Foot must be bimoraic or disyllabic. By transitivity, then, a Prosodic Word must contain at least two moras or syllables.*

By observing some of the smallest stressed free-standing words in Sliammon, we can see that Minimality is generally respected. A word which consists of a Foot is either bimoraic (μμ) as shown by the data in (23) or is disyllabic (σσ) as shown by the data in (24).

(23) Bimoraic Words

	Input	Bimoraic Foot	Output	Gloss
a.	p̓ix̌ʷ	(p̓í$_{\mu}$ x̌$^{w}{}_{\mu}$)	p̓ɛ́x̌ʷ	*flood*
b.	t̓in	(t̓í$_{\mu}$ n$_{\mu}$)	t̓ɛ́n	*barbecued salmon*
c.	p̓uq̓ʷ	(p̓ú$_{\mu}$ q̓$^{w}{}_{\mu}$)	p̓óq̓ʷ	*brown, grey*
d.	čuy̓	(čú$_{\mu}$ y̓$_{\mu}$)	čúy̓	*child*
e.	x̌aƛ̓	(x̌á$_{\mu}$ ƛ̓$_{\mu}$)	x̌áƛ̓	*want*
f.	tan	(tá$_{\mu}$ n$_{\mu}$)	tán	*mother*

(24) Disyllabic Words

	Input	Disyllabic Foot	Output	Gloss
a.	ppa	(pə́ . pʌ)	pə́pʌ	*pepper*
b.	pču	(pə́ . ču)	píču	*cedar root basket*
c.	qǰi	(qə́ . ǰi)	qʌ́ǰi ~ qə́ǰi	*again*

Furthermore, at the present point in time only two mono-moraic Roots of the shape CV have been recorded. They are θu and hu which are both variants of the verbal auxiliary *go.* (cf. Appendix V, and Watanabe 2000 for a similar observation regarding the general lack of CV Roots in Sliammon). This observation seems to indicate that content words which are mono-moraic are in some sense "too small", and are therefore generally excluded by constraints on Minimal Word in the language. The question then is how are θu ~ hu licensed?

It should also be noted that the verbal auxiliary θu/hu occurs in predicate-initial position, and is often followed by a second-position enclitic (subject, imperative, quotative etc.,) which seem to be footed with the preceding auxiliary, as shown by the examples in (25). By subsuming the enclitic within the domain of the Prosodic Word, the resulting Foot satisfies Foot Binarity.

(25)

	Input		Output	Gloss
a.	hu ga t̓ᶿux̌ʷ=unis-m	húga t̓ᶿúx̌ʷuniˇsəm	hógʌ t̓ᶿóx̌ʷonɛ̀səm	*go brush your teeth!*
b.	hu ga mʔ-t	húga mə́ʔt	hógʌ máʔtʰ	*go get it!*
c.	hu ga šʔ	húga šə́ʔ	hógʌ šɛ́ʔ	*go upstairs!*
d.	hu č IMP-nšm+[ʔ]	húč nə́n̓šəm	hóčʰ nín̓šəm	*I'm going swimming*

The problem which we need to address here however, concerns the status of free-standing Cə́C Roots/Stems, such as those cited in (26).

(26)

	Input	Epenthesis	Output	Gloss
a.	ƛ̓p	ƛ̓əp	ƛ̓ʌ́pʰ	*deep*
b.	č̓ɬ	č̓əɬ	č̓íɬ	*rain*
c.	mƛ̓	məƛ̓	mʌ́ƛ̓	*calm* (on water)
d.	pq	pəq	pʌ́qʰ	*white*
f.	x̌ƛ	x̌əƛ	x̌ʌ́ƛ	*break* (e.g. a rope)
g.	mq̓	məq̓	mʌ́q̓	*full* (from eating)

h. qx̌	qəx̌	qʌ́x̌	*many, lots*
i. ƛ̓q	ƛ̓əq	ƛ̓ʌ́qʰ	*outside*
j. ƛ̓q̓	ƛ̓əq̓	ƛ̓ʌ́q̓	*rotten* (fruit, berries)

Notice that when these Roots occur in a sentential context, they are stressed, as shown by the data in (27). The predicate in question either occurs in word-initial position, as in (27.a-d) or in the position of the main verb with the presence of a verbal auxiliary or other predicative element (27.e-g). The example in (27.h) shows the Cə́C Root in an overt DP preceded by the article kʷ.

(27)

Input	Foot Structure	Output	Gloss
a. mƛ̓ s t̓ᶿuk̓ʷ	(mə́ƛ̓) s t̓ᶿók̓ʷ	mʌ́ƛ̓	*calm today*
b. pq tə ʔayaʔ	(pə́qʰ) tə ʔáyɛʔ	pʌ́qʰ	*the house is white*
c. x̌ƛ tə x̌ʷil̓m	(x̌ə́ƛ) tᵊ x̌ʷéʔləm	x̌ʌ́ƛ	*the rope broke*
d. qx̌ puʔpxʷ	(qə́x̌) púʔpxʷ	qʌ́x̌	*lots of kindling*
e. hi hw ƛ̓p	hɛ́:w (ƛ̓ə́pʰ)	ƛ̓ʌ́p	*it's really deep*
f. kʷn a čxʷ mq̓	kʷʌ́næčxʷ (mə́q̓)	mʌ́q̓	*Are you full?*
g. hu ga ƛ̓q	hógʌ (ƛ̓ə́qʰ)	ƛ̓ʌ́q	*go outside!*
h. hi hw say-mut kʷ č̓ɬ	hɛ́:w sáymʊtʰ kʷ (č̓ə́ɬ)	č̓íɬ	*it's really raining*

The (Cə́C) Root in question is footed as indicated by the presence of primary stress and the brackets to indicate the Foot boundary. It should be noted that the article tə and the syntactic nominalizer s are proclitics, and are therefore phonologically dependent on the Prosodic Word which follows in (27.a-c); these proclitics do not affect the footing of the (Cə́C) predicate which precedes them.

Given the model adopted in this thesis, schwa is characterized as a bare Nucleus, and does not have any phonological weight associated with it (i.e. it is non-moraic), as argued in Chapter 2. The question, then, is do these stressed lexical words of the form Cə́C in (26-27) satisfy or violate

Minimality? Recall that Minimality is derived from the Prosodic Hierarchy and its interaction with FOOT BINARITY, as in (22). It is clear from the examples in (26-27) that Cə́C words do not satisfy Foot Binarity at the level of the syllable since they are clearly not disyllabic; however, do these words satisfy Foot Binarity at the moraic level? In other words, are they represented as in (28.a) or (28.b)?

(28)

	Input		Output	Gloss
a.	č̓ɬ$_\mu$	č̓[ə]ɬ$_\mu$	(č̓ə́ɬ$_\mu$)	*rain*
b.	č̓ɬ$_\mu$	č̓[ə$_\mu$]ɬ$_\mu$	(č̓ə́$_\mu$ɬ$_\mu$)	*rain*

3.1.3.2 Discussion and Proposed Analysis

There seem to be two plausible lines of argumentation. First, although schwa often behaves phonologically as though it is non-moraic, schwa in this context could be constrained to be both Nuclear and moraic in order to satisfy Foot Binarity (=28.b). The cost of such an analysis would be the insertion of additional structure; in particular, a violation of both DEP[NUC] and DEP[μ]. This implies the following partial constraint ranking:

(29) FTBINμ >> DEP[NUC], DEP[μ]

In this case, Foot Binarity at the level of the mora must be satisfied at the expense of a DEP[NUC] and a DEP[μ] violation.

The other possible analysis is that the constraint FTBINμ is ranked in such a way that it is violated in this context, and that these Cə́C forms represent degenerate feet in Sliammon. Given Optimality Theory, FTBINμ would be violated in order to satisfy some higher-ranked constraint in the grammar, yielding the output in (28.a). A plausible candidate is the interface constraint which ensures that every lexical content word receives stress. The following discussion pursues this hypothesis.

Prince and Smolensky (1993: 43) discuss Lx≈PR(MCat) which requires that a member of a morphological category (MCat: Root, Stem, Word) corresponds to a prosodic category (PCat: Foot, PrWd). They also propose that these relations between morphological categories and prosodic categories can be achieved via Alignment (cf. also McCarthy and Prince 1993.b on Generalized Alignment). Alignment ensures that the left or right edge of a morphological category matches with the corresponding edge of the relevant prosodic category, making special reference to an edge (cf. also Chen 1987, Selkirk, Nespor and Vogel, McCarthy and Prince 1993). The alignment constraint in the case of Sliammon is given in (30).

(30) Align L (MStem ; Foot)

Align the left edge of every morphological stem with the left edge of a Foot (Ft).

If the interface constraint Align L (MStem; Ft) is ranked above Foot Binarity (FTBINμ, σ), then it will be more important to ensure that the left-edge of every stem is aligned with a Foot than it is to satisfy FTBINμ. Therefore, CəC Roots, which themselves are well-formed stems, are stressed eventhough they fail to satisfy Foot Binarity, as shown by the partial ranking in (31).

(31) č̓ɬ č̓əɬ [č̓íɬ] *rain*

Input: č̓ɬ $_{\mu}$	ALIGN L (MSTEM ; FT)	FTBINμ	DEP[NUC]
☞ a. (č̓ə́ɬ$_{\mu}$)		*	*
b. č̓əɬ$_{\mu}$	*!		*

The optimal candidate in (31.a) is footed and satisfies the Align constraint at the expense of creating a mono-moraic Foot. Candidate (31.b) is ruled out since the lexical content word č̓əɬ, which is itself a stem, fails to be aligned with the left-edge of the Foot.

One of the questions which this proposal raises is why there is no augmentation in order to satisfy Foot Binarity? If the constraints on Root Faithfulness are dominant, in particular

DEP[μ]$_{Root}$, then strengthening will be ruled out, as shown by the tableau in (32). Weak Roots are faithful to moraic structure.

(32) čɬ čə́ɬ [čɨ́ɬ] *rain*

Input: čɬ μ	ROOT FAITH: DEP[μ]	ALIGN L (MSTEM ; FT)	FTBINμ	DEP[NUC]
☞ a. (čə́ɬ μ)			*	*
b. (čə́ μɬμ)	*!			*
c. čəɬμ		*!		*

This may be considered an unorthodox proposal given the claims of Prince and Smolensky (1993: 109) who suggest that "Lx≈PR and FTBIN are universally undominated." However, in the true spirit of OT, all constraints are violable. The proposal which is made here is that in a limited set of cases Foot Binarity is violated in order to satisfy Root Faithfulness. A Root in a non-derived domain can be sub-minimal because of Faithfulness. This appropriately characterizes the degenerate mono-moraic (Cə́C$_{\mu}$) feet in Sliammon. This proposal seems to find support in the fact that these words are shorter in duration than free-standing bimoraic words, such as those in (23), and as documented in Chapter 2.

3.1.4 Summary

This section has presented arguments for the moraic structure which is assumed in this thesis. Of particular importance is the claim that all coda consonants are moraic in Sliammon. In addition, evidence from stress assignment provides support for the claim that schwa is non-moraic in contrast to the full vowels which are moraic, since CəC functions as light whereas CAC behaves as heavy. This claim has interesting implications regarding the licensing of free-standing Cə́C stems.

3.2 Syllable Structure

This section outlines the basic syllable structure constraints in Sliammon, building on the basic descriptive generalizations of Blake (1992). Two new observations are worth noting. First of all, Sliammon makes limited use of so-called "minor syllables"; these are obstruent-only syllables of the shape CC. These non-nuclear syllables occur at the right-edge of mono-morphemic stems, such as sáɬ . txʷ *woman* or t̓ᶿám . qʷɬ *cloud*. These syllables are of particular interest with respect to our discussion of the distribution of schwa in Sliammon since these "extra" consonants do not trigger schwa epenthesis in order to satisfy the constraint that all syllables have Nuclei (cf. §3.2.1.2).

The second observation relates to the general ban on Complex Onsets in the language. Although Sliammon lacks word-initial Complex Onsets, there are a limited number of word-internal st- Onsets which have not been discussed elsewhere.

3.2.1 Simple Syllables

This section discusses "simple" CVC syllable structure in Sliammon, and establishes the constraints on the occurrence of syllable-internal "constituents" : Onset, Nucleus and Coda. Within the Nuclear Moraic model, the "Onset" is identified as the non-moraic consonant which precedes either a Nucleus, or a moraic consonant (e.g. in the case of a CCμ Minor syllable). The term "coda" refers to the moraic consonant which occurs either after the vocalic nucleus and within the same syllable, or after the non-moraic onset in the case of CCμ syllables. I will continue to use the convenient labels "onset" and "coda" in the discussion which follows. It will be argued here that all syllables in the language have a single Onset consonant, and that coda consonants are permitted. Section 3.2.1.2 argues that although all content words surface with a vocalic nucleus, not all syllables do. This section makes an important contribution to our understanding of Sliammon phonology in that it documents the existence of so-called Minor Syllables in the language, and explains the observed asymmetry between the numbers of consonants allowed at the beginning of words versus the number of consonants permitted word-finally (cf. Blake 1992 on extra-metrical consonants at the right-hand edge of the word domain). Complex constituents, such as Complex Onsets and Complex Codas, are discussed in §3.2.2.

3.2.1.1 Onset

3.2.1.1.1 The Data

Words in Sliammon generally begin with a single consonant, as shown by the mono-morphemic lexical items presented in (33).

(33)

	Input		Output	Gloss
a.	mix̌aɬ	méx̌ʌɬ	mé . x̌ʌɬ .	*black bear*
b.	p̓uhu	p̓óho	p̓ó . ho .	*raven* (messenger)
c.	kʷuma	kʷúma	kʷú . ma .	*ratfish*
d.	qʷuwət	qʷówʊt ~ qʷówɪt	qʷó . wʊt .	*beaver*
e.	q̓ʷalas	q̓ʷálʌs	q̓ʷá . lʌs .	*raccoon*
f.	wax̌as	wáx̌ʌs	wá . x̌ʌs .	*green frog*

There are no vowel-initial words in the language, nor is there any evidence for vowel-initial Roots either. Roots are always consonant initial, as shown by the data throughout this dissertation, and by the Root List in Appendix 5. When a vowel-final Root is followed by a vowel-initial Lexical Suffix, an epenthetic [h] intervenes, as shown by the data in (34).

(34) Root=LS

	Input		Output	Gloss
a.	wax̌at̓ᶿi=aya	wáx̌at̓ᶿi[h]àya	wáx̌at̓ᶿɛ[h]àyɛ	*pipe case*
a'.	wax̌at̓ᶿi		wáx̌at̓ᶿɛ	*pipe (for smoking tobacco)*
b.	kapi=aya	kápi[h]àya	kʸápi[h]àyɛ	*coffee pot*
b'.	kapi		kʸápi ~ kápi	*coffee*

c. q̓nayu=aya	q̓ə́nayu[h]àya	q̓ʌ́nayo[h]àyɛ	*sewing needle case*
c'. q̓n=ayu	q̓ənayu	q̓ʌ́nayo	*sewing needle*
d. lamatu=ukʷt	lámatu[h]ùkʷt	lámato[h]òkʷtʰ	*sheep's wool, I. sweater*
d'. lamatu		lámato	*sheep* (< Fr. via C.Jargon)

Other cases of vowel hiatus within the affixal domain involve deletion, as shown in (35), and discussed in detail in Blake (2000).

(35)

	Input		Output	Gloss
a.	č̓a-č̓ag-aθi-as	č̓áč̓agàθis	č̓ɛ́č̓ɛgàθɩs	*s/he is helping you (sg)*
b.	ya-yaɬ-aθi-as	yáyaɬàθis	yɛ́yɛɬàθɩs	*s/he is calling you (sg)*
c.	č̓a-č̓ag-at-an̓api-as	č̓áč̓agatàʔnapis	č̓ɛ́č̓ɛgatàʔnapɩs	*s/he is helping you (pl)*
d.	ya-yaɬ-at-anapi-as	yáyaɬatànapis	yɛ́yɛɬatànapɩs	*s/he is calling you (pl)*

3.2.1.1.2 Proposed Analysis

The Onset constraint is defined in (36) following Prince and Smolensky (1993:25) and McCarthy and Prince (1993). Since there is no evidence that this constraint is ever violated, it is proposed here that it is undominated in Sliammon.

(36) ONSET   Every syllable has an Onset

The constraint ONSET must dominate DEP[h] which militates against the insertion of epenthetic [h]. Since [h] is the least specified consonant in the system, and is arguably characterized as having a PHAR specification, the constraint DEP[h] or DEP[PHAR] will keep track of the cost associated with h-epenthesis.

(37) DEP[h]

An [h] which is present in the Output and not present in the Input will incur a DEP[h] violation.

DEP[h] belongs to the family of Faithfulness constraints within a correspondence model of Optimality Theory, following Prince and Smolensky (1993) and McCarthy and Prince (1994). An [h] which is present in the Output but is not present in the Input violates DEP[h] since there is a lack of correspondence between the Input and the Output.

If ONSET and ROOT FAITH (i.e. MAX[f]) outrank DEP[h], then an epenthetic [h] occurs in order to provide an Onset, and also to avoid deletion of either the vowel belonging to the Root or the vowel belonging to the following Lexical Suffix (LS). As argued in Blake (2000), Lexical Suffixes in Sliammon behave like Roots with respect to vowel hiatus, and are therefore analyzed as bound Roots. As bound Roots, Lexical Suffixes will be subject to Root Faithfulness constraints rather than to Affix Faithfulness, following Blake (1995, 1996, 2000). Consider the tableau in (38) which shows h-epenthesis between a Root and following LS =aya *place, container.*

(38) tala=aya [tálahàyɛ] *purse*

Input: tala=aya	ONSET	ROOT FAITH (MAX)	DEP[h]
☞ a. ta . la . [h]a . ya			*
b. ta . la<a> . ya		*!	
c. ta . la . a . ya	*!		

What is interesting about Sliammon is that vowels in hiatus are treated differently depending on their morphological affiliation, but the high-ranking Onset constraint is always satisfied.

3.2.1.1.3 Gemination: Onsets and Faithfulness to Moraic Structure

The data in (39) show that an intervocalic resonant is systematically parsed by speakers as the coda to the preceding syllable and as the Onset to the following syllable. This occurs with CC and CCC Roots in (39), and with some examples of Roots containing a full vowel in (40).

(39)

	Input	Output	Syllabification	Gloss
a.	qʷl̓ a čxʷm	qʷʊ́l̓æčxʷʊm	qʷə́l̓ . læč . xʷəm	*Are you sg. coming?*
b.	qʷl̓ a čap sm	qʷʊ́l̓æčɩpsəm	qʷə́l̓ . læ . čɩp . səm	*Are you pl. coming?*
c.	wn-ʔm-min	wə́namɩn	wə́n . na . mɩn	*a drill*
d.	k̓lθ+[i]	k̓ɩ́lɩθ	k̓ə́l . lɩθ	*crooked*
e.	t̓lk̓+[i]	t̓ʌ́lɩk̓	t̓ə́l . lɩk̓	*a hole*

(40)

	Input	Output	Syllabification	Gloss
a.	ʔimaθ	ʔɛ́mʌθ	ʔɛ́m . mʌθ	*grandchild*
b.	ʔayiš	ʔáyiš ~ ʔáyɩš	ʔáy . yɩš	*man's sister, cousin*
c.	ʔayaʔ-s	ʔáyɛʔs	ʔáy . yɛʔs	*his house*
d.	CəC$_{PL}$-ǰanxʷ	ǰɩ́nǰɛ̀nʊxʷ	ǰə́n . ǰɛ̀n . nəxʷ	*lots of fish*
e.	kʷul=aw̓txʷ	kʷúlàwtxʷ	kʷúl . làw . txʷ	*school*

If all coda consonants are moraic in the language as evidenced by Compensatory Lengthening, and the stress facts in §3.1.1 above, then there is no inherent length contrast in post-vocalic consonants in the language. If post-vocalic consonants were ambi-syllabic (non-moraic) then these would be the only non-moraic coda consonants in the language. Since this would be non-structure preserving in the sense of Kiparsky, it is proposed here that these consonants are moraic, and that gemination satisfies the constraint that all syllables have Onsets. In addition, gemination also satisfies the constraint MAX[μ] which ensures a Faithful parse of underlying moraic contrasts. This proposal is confirmed in a number of different ways. Native speakers certainly syllabify these strings differently, and Harris (1981) writing on Island Comox treats these consonants as geminates. Both P. Kroeber and H. Watanabe (p.c.) both note that these consonants may be longer in duration, judging from their own transcriptions of Sliammon. These array of facts leads me to hypothesize here that these consonants are moraic.

Notice that gemination of an intervocalic consonant has the effect of satisfying the high-ranking Onset constraint in the language while also maintaining the moraic structure of the Root (cf. Chapter 5).

3.2.1.2 Nucleus

This next section addresses the status of the Nucleus in Sliammon. There is a growing body of literature which recognizes the Nucleus as the core of the syllable. For example, Levin (1985) argues that the syllable is projected from a single primitive category Nucleus which is the head of the syllable. Shaw (1992) adduces templatic evidence in favour of a Nucleus based on her analysis of reduplication in Nootka and Nitinaht (Wakashan), and Ojibwe (Algonquian). Early reference to the role of the Nucleus in syllable structure include Trubetzkoy (1939), and Fudge (1976), amongst others (cf. also references in Anderson (1985), and Kenstowicz (1994)). Bagemihl (1991), Shaw (1993, 1996) make reference to the Nucleus in their discussion of Nuχalk (Bella Coola) and St'at'imcets (Lillooet).

Within Optimality Theory, the central role of the Nucleus is characterized by the constraint SYLL NUC, following Prince and Smolensky (1993: 87).

(41.a) SYLL NUC — Syllables have vocalic nuclei

Shaw (1996.c) captues this same generalization with reference to Proper Headedness:

(41.b) PROPHEAD σ — A syllable is headed by a NUC [=SYLL NUC]

This is important since it will be argued in §3.2.2.3 that although many/most syllables in Sliammon satisfy SYLL NUC/PROPHEADσ, there are a limited number of obstruent-only syllables in the language -- syllables which clearly violate this constraint .

The presence of a surface full vowel satisfies SYLL NUC / PROPHEADσ in the data in (42).

(42) Full Vowels

	Input		Output	Gloss
a.	x̌it̓ᶿ	x̌it̓ᶿ	x̌ɛ́t̓ᶿ	*iron, metal*
b.	k̓ʷin	k̓ʷin	k̓ʷɛ́n	*how many?*
c.	ɬuk̓ʷ	ɬuk̓ʷ	ɬúk̓ʷ	*to fly*
d.	wuk̓ʷ	wuk̓ʷ	wúk̓ʷ	*scoop net*
e.	k̓ʷas	k̓ʷas	k̓ʷás	*hot* (temperature)
f.	pal̓	pal̓	pál̓	*heron*

The presence of schwa in the Output in (43-44) also satisfies this constraint. Since constraints in OT are constraints on outputs, whether or not schwa is present in the Input is irrelevant to the satisfaction of SYLL NUC - the constraint evaluates whether or not each syllable contains a Nucleus in the Output.

(43) Schwa

	Input		Output	Gloss
a.	qəǰi	qəǰi	qə́ǰi	*again, still*
b.	pəču	pəču	píču	*cedar root basket*
c.	nəxʷiɬ	nəxʷiɬ	nʊ́xʷɩɬ	*dugout canoe*
d.	təkʷɬi	təkʷɬi	tʊ́kʷɬe	*rabbit*
e.	təq̓ʷa	təʔq̓ʷa	táʔq̓ʷa	*octopus, devil fish*
f.	qəy̓a	qəʔya	qáʔyɛ	*water*
g.	mən̓a	məʔna	máʔna	*one's child, offspring*

(44) Schwa epenthesis

	Root	Schwa Epenthesis	Output	Gloss
a.	qǰi	q[ə]ǰi	qə́ǰi	*again, still*
b.	pču	p[ə]ču	pɪ́ču	*cedar root basket*
c.	nxʷiɬ	n[ə]xʷiɬ	nʊ́xʷɪɬ	*dugout canoe*
d.	tkʷɬi	t[ə]kʷɬi	tʊ́kʷɬe	*rabbit*
e.	tq̓ʷa	t[ə]q̓ʷa	táʔq̓ʷa	*octopus, devil fish*
f.	qy̓a	q[ə]y̓a	qáʔyɛ	*water*
g.	mn̓a	m[ə]n̓a	máʔna	*one's child, offspring*

3.2.1.3 Coda

3.2.1.3.1 The Data

Sliammon has syllables which are closed by a moraic coda consonant, as shown by the data in (45). The syllabification in Column 2 is provided by speakers of Sliammon.

(45) Closed syllables

	Input	Syllabification	Output	Gloss
a.	DIM-kʷupa+[ʔ]	. kʷukʷ . paʔ .	kʷúkʷpaʔ	*grandfather*
b.	x̌ap̓	. x̌ap̓ .	x̌áp̓	*cradle basket*
c.	t̓ᶿixʷ-t̓ᶿixʷ	. t̓ᶿixʷ . t̓ᶿixʷ .	t̓ᶿéxʷt̓ᶿexʷ	*fish hawk*
d.	muš-muš	. muš . muš .	múšmuš	*cow*
e.	t̓aq-t̓aq	. t̓aq . t̓aq .	t̓áqt̓aq	*slow*

It will be argued in §3.2.2.1 that Sliammon generally lacks Complex Onsets, so that [kʷp, xʷt̓ᶿ, šm, qt] are not licit Onsets.

3.2.1.3.2 Proposed Analysis

Since coda consonants occur frequently in the language, this entails that the constraint NO CODA must be low-ranking in Sliammon. In addition, the family of Faithfulness constraints which ensure that a lexically specified post-vocalic consonant has a surface correspondence must be higher-ranking. The relevant constraints are given in (46).

(46)

NO CODA	Syllables are open (M&P 1993: 10)
MAX[f]	Each feature [f-element] in the Input is in a correspondence relation with a feature in the Output.
DEP[f]	Each feature in the Output is in a correspondence relation with a feature in the Input.

The constraint MAX[C] is a constraint which evaluates the cost associated with deletion of a consonant whereas DEP[C] is the constraint which evaluates the insertion of a consonant which is not in the Input. The constraint which ensures that syllables are open (NO CODA) is violated in order to satisfy Faithfulness (MAX and DEP constraints), as shown by the partial ranking in (47) and the tableau in (48).

(47) FAITHFULNESS >> NO CODA

(48) x̌ap̓ [x̌áp̓] *cradle basket*

Input: x̌ap̓	FAITHFULNESS	NO CODA
☞ a. x̌ap̓		*
b. x̌a <p̓>	*! MAX [C]	
c. x̌ap̓[a]	*! DEP [a]	

As shown by the tableau in (48), there is a faithful parse of the consonants and vowels in the Input and the correspondence relations between segments/features in the Input/Output are maintained. Since Faithfulness is ranked higher than NO CODA, deletion of the coda consonant is ruled out, as shown by candidate (48.b). Faithfulness also rules out vowel epenthesis which occurs in order to try and avoid a violation of NO CODA, as in (48.c).

3.2.2 Complex Syllable-Internal Constituents

More traditional linguistic theories use surface phonotactics to determine the possible types of syllables in a language. It will be argued in §3.2.2.1, that while Sliammon typically avoids Complex Onsets, a limited number of word-internal [st-] Onsets do occur in order to satisfy higher-ranking constraints on the Alignment of prosodic and morphological constituents. Violation of *Complex Onset is therefore optimal in a specific context - and occurs just when required to do so by a higher-ranking constraint. The ban on Complex Onsets cannot be viewed as a surface true generalization across the entire set of syllabified words. Again it is constraint ranking, constraint conflict and minimal violation which determine the most harmonic output.

In §3.2.2.2, it will be argued that Sliammon avoids heteromorphemic CA-CC syllables since they violate the constraint against trimoraic syllables in the language ($*\mu\mu\mu]_{\sigma}$). At the same time, trimoraic syllables do occur in mono-morphemic Roots, such as CACC. High-ranking Root Faithfulness and the constraint on Root Contiguity drive violation of $*\mu\mu\mu]\sigma$. It is therefore not possible to make a statement regarding the output of syllabification which follows simply from the surface phonotactics and which does not take the morphological constituency into consideration.

As pointed out by McCarthy and Prince (1993), a model of phonology in which constraints or generalizations about the language *must be* surface true is untenable. Within OT, the optimal candidate may actually violate a number of constraints in order to satisfy some higher-ranked constraint within the grammar. The syllable typology which immerges is therefore complex and derived from the interaction of prosodic and morphological constraints.

3.2.2.1 *Complex Onset

Not only do syllables in Sliammon have an obligatory Onset but there is also a general lack of word-initial consonant clusters in Sliammon. The general ban on Complex Onsets is discussed in the next section.

3.2.2.1.1 The Data

Schwa occurs between the first two consonants of a CR'V Root, as shown by the data in (49) Column 2. Given a theoretical framework which lacks constraints on Inputs, consider what would happen if the speaker posits an Input representation in which schwa is not present in the Input. As shown by the output forms in (49), schwa occurs between the first two consonants, and avoids a violation of the constraint *COMPLEX ONSET. The ungrammatical forms in (49.a'-e') show that Sliammon lacks word-initial CR' Onsets.

(49) CR'V Roots

	Input		Output	Gloss
a.	sm̓a	səʔ . ma	sə́ʔma	*mussel*
a'.	sm̓a		*sm̓á	
a".	sm̓a		*sm̩ . ʔa	
b.	mn̓a	məʔ . na	mə́ʔna	*one's child, offspring*
b'.	mn̓a		*mn̓á	
b".	mn̓a		*mn̩ . ʔa	
c.	ʔl̓as / ʔal̓əs	ʔəʔ . las	ʔə́ʔlʌs	*sea cucumber*
c'.	ʔl̓as		*ʔl̓ás	
c".	ʔl̓as		*ʔl̩ . ʔas	
d.	qy̓a	qəʔ . ya	qə́ʔyɛ	*water*
d'.	qy̓a		*qy̓a	
d'.	qy̓a		*qi . ʔa .	

e. k̓ʷw̓a	k̓ʷəʔ . wa	k̓ʷáʔwa	*stomach, belly*
e'. k̓ʷw̓a		*k̓ʷw̓a	
e". k̓ʷw̓a		*k̓ʷu . ʔa .	

Note also that the resonants m , n , l , y , w are not syllabic, as shown by the ungrammatical forms in (49.a"-e"). The glides y, w do not undergo vocalization in this position either in order to satisfy the constraint which requires a vocalic nucleus, as shown by the contrast between (49.a-e) and (49.a"-e")[1].

A survey of word-internal obstruent resonant clusters and the syllabification of these clusters shows that *CR Onsets are banned in word-internal syllables as well.

(50)

Input	Syllabification	Output	Gloss
a. ʔatnupil	ʔát . nu . p̓il	ʔátnop̓ɛl	*car, automobile*
a'.	*ʔá . tnu . p̓il		
b. saplin	sáp . lin	sáplɛn	*bread*
b'.	*sá . plin		
c. θičmus	θíč . mus	θíčmɔs	*back of house*
c'.	*θí . čmus		
d. lkli	lə́k . li	lɪ́klɛ	*key*
d'.	*lə́ . kli		
e. watla	wát . la	wátla ~ wátʰla	*sweetheart*
e'.	*wá . tla		
f. DIM-x̌ʷil̓[-i-]m+[ʔ]	x̌ʷíx̌ʷ . lim̓	x̌ʷɛ́x̌ʷlɛm̓	*string, thread*
f'.	*x̌ʷí . x̌ʷlim̓		

[1] It is not that glides never undergo glide/vowel alternations; they do. The factor which may be affecting the surface form in these cases is the presence of a glottalized resonant R'. Notice that CVR'V is systematically realized as Cv́ʔRv and not as *Cv́Rʔv (§5.2). Glottalization occurs adjacent to the stressed vowel and occupies syllable coda position, not the Onset of the weak member of a stress foot.

Not only does Sliammon lack CR Onsets but it also lacks OO (obstruent) Onsets as well, as shown by the data in (51). It should be noted that it is quite difficult to find mono-morphemic word-internal obstruent clusters since canonical Roots are predominately CVC/CəC or extended CVCV, CVCVC in shape. I have included diminutive forms since the word-internal consonant cluster occurs within the Root and not across a morpheme boundary, so as to avoid complications with syllabification potentially being affected by the presence of the edge of a morphological category.

(51) word-internal CC clusters

	Input	Syllabification	Output	Gloss
a.	x̌ʷatq̓ʷ-m	x̌ʷat . q̓ʷəm	x̌ʷátq̓ʷɔm	*thunder*
a'.		*x̌ʷa . tq̓ʷəm		
b.	tkʷɬi	təkʷ . ɬi	tʊ́kʷɬe	*rabbit*
b'.		*tə . kʷɬi		
c.	DIM-kʷupa+[ʔ]	kʷukʷ . paʔ	kʷúkʷpaʔ	*grandfather*
c'.		*kʷu . kʷpaʔ		
d.	DIM-qʷasm+[ʔ]	qʷaqʷ . səm̓	qʷáqʷsəm̓	*little flower*
d'.		*qʷa . qʷsəm̓		
e.	DIM-x̌us-[i]m+[ʔ]	x̌ʷux̌ʷ . sim̓	x̌ʷóx̌ʷsɩm̓	*small soapberry*
e'.		*x̌ʷu . x̌ʷsim̓		

The lack of CR onsets predicts the lack of obstruent obstruent (OO) onsets given the sonority sequencing generalization of Clements (1990). If a language allows an Onset cluster with a level sonority profile it typically allows an Onset cluster which has a rising sonority towards the nucleus (OR), given markedness. Notice that the word-internal cluster is heterosyllabic, as shown by the Sliammon data in (51.a-e).

3.2.2.1.2 Proposed Analysis

The relevant syllable structure constraints are provided in (52)

(52) NO CODA — Syllables are open — (M&P 1993:10)

*COMPLEX ONSET — Syllables do not have complex onsets

The Sliammon facts in (49-51) show that it is better to incur an extra violation of the constraint NO CODA than it is to violate *COMPLEX ONSET. This partial ranking is given in (53) and illustrated by the tableau in (54).

(53) *COMPLEX ONSET >> NO CODA

(54) DIM-k^wupa+[ʔ] [k^wúk^wpaʔ] *grandfather*

k^wu-k^wpaʔ	COMPLEX ONSET	NO CODA
☞ a. k^wúk^w . paʔ		**
b. k^wú . k^wpaʔ	*!	*

As observed in §3.2.1.3, Faithfulness (here MAX [C]) is ranked higher than NO CODA in order to prevent deletion of a Root consonant, as shown by the tableau in (55).

(55) DIM-k^wupa+[ʔ] k^wúk^wpaʔ *grandfather*

k^wu-k^wpaʔ	ROOT FAITH: MAX [C]	NO CODA
a. k^wúk^w . paʔ		**
b. k^wú<k^w> . paʔ	*!	*
c. k^wú . k^w<p>aʔ	*!	*

3.2.2.1.3 Comparative Evidence for the lack of Complex Onsets

The next section provides comparative evidence which shows the lack of complex onsets in the language. As shown above, only a single consonant appears in word-initial position. In fact, one of the striking properties of Sliammon is the absence of the nominalizing prefix s- which is found in all of the other Salish languages (cf. Davis 1970:15 and §5.6).

3.2.2.1.3.1 Sliammon / Sechelt Data

Compare the Sliammon (Sl) and Sechelt (Se) forms in (56) which show the absence of this widespread prefix in Sliammon, cited from Blake (1992:49). Sechelt data are cited from Beaumont (1985), abbreviated RCB. The forms he cites are provided in the Sechelt practical orthography and appear in angled brackets < >. I have reconstructed the Input/Output forms based on the guide to pronunciation (Beaumont 1985:5-13).

(56) Initial Complex Onsets: A comparison of Sliammon and Sechelt cognates

	Input	Output		Gloss	Language
a.	nxʷiL	nʊ́xʷɩɬ		*dugout canoe*	*Sl*
a'.	s-nxʷiɬ	snə́xʷɩ́ɬ	<snéxwílh>	*canoe* (RCB)	*Se*
b.	q̓ʷay̓x̌	q̓ʷʌ́y̓x̌ ~ q̓ʷéy̓ᵊx̌		*firewood*	*Sl*
b'.	s-q̓ʷyx̌	sq̓ʷʌ́yɩx̌	<sk̲w'éyex̲>	*firewood* (RCB)	*Se*
c.	x̌ʷs	x̌ʷʌ́s		*animal fat, lard*	*Sl*
c'.	s-x̌ʷəs	sx̌ʷʌ́s	<sx̲wes>	*grease* (RCB)	*Se*
d.	tumiš	túmɩš		*man*	*Sl*
d'.	s-tumiš	stʊ́mɩš	<stúmish>	*man* (RCB)	*Se*

3.2.2.1.3.2 Sliammon / hə́n̓q̓əmin̓əm̓ (Musqueam) Data

The historical loss of the widespread nominalizing prefix s- is shown again by a comparison of Sliammon and hən̓q̓əmin̓əm̓ (Musqueam) cognates in (57.a-i'). Musqueam (Msq) is a related Coast Salish language spoken in the lower Fraser River delta, and is separated from Sliammon (Sl) by Squamish and Sechelt territories[2].

(57) Initial Complex Onsets: A comparison of Sliammon and Musqueam cognates

	Output	Gloss	Language
a. nəxʷiL	núxʷɩɬ ~ nʊ́xʷ:ɩɬ	*dugout canoe*	Sl
a'. s-nəxʷəɬ	snəxʷəɬ	*canoe*	Msq[3]
b. q̓aʔƛ̓	q̓aʔƛ̓	*sea otter*	Sl
b'. s-q̓e:ƛ̓	sq̓æ:ƛ̓	*sea otter*	Msq
c. kʷakʷ=aj̓u	kʷákʷaʔǰu	*squirrel*	Sl
c'. s-kʷayaʔ	skʷáyaʔ	*squirrel*	Msq
d. č̓əq	č̓ʌq	*robin, tiny bird*	Sl
d'. s-k̓ʷqeq	sk̓ʷqɛq	*robin*	Msq
e. ɬag̓at̓	ɬáʔgət̓	*herring*	Sl
e'. s-ɬewət̓	sɬɛ́wət̓	*herring*	Msq

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[2]The hən̓q̓əmin̓əm̓ (Musqueam) data are cited with permission from the collaborative Musqueam/UBC FNLG materials: © 1999 Musqueam Indian Band and UBC FNLG. I gratefully acknowledge the contribution of all of the elders who have made this research possible; especially Adeline Point, the late Edna Grant, the late Arnold Guerin, the late Dominic Point: hay ce:p q̓a si:ʔem̓.

[3]These cognates exhibit other well-attested sound correspondences: Sl č̓ corresponds to Msq k̓ʷ. Sl g corresponds to Msq w; Sl š corresponds to Msq x. In addition, Proto-Salish *u became a/e in hən̓q̓əmin̓əm̓, as noted by Elmendorf and Suttles (1960), and u in Sliammon. See also Kuipers (1981, 1982), Kinkade (1998) , Kroeber (1991/1999) for comparative Salish sound correspondences, and Suttles (forthcoming) on hən̓q̓əmin̓əm̓.

f. θəqay	θə́qəy	*sockeye*	Sl
f'. s-θəqəy̓	sθə́qəy̓ ~sθə́qiʔ	*sockeye*	Msq
g. t̓ᶿit̓ᶿik̓ʷ	t̓ᶿét̓ᶿek̓ʷ	*worm*	Sl
g'. s-t̓ᶿək̓ʷ	st̓ᶿək̓ʷ	*worm*	Msq
h. t̓ᶿit̓ᶿiq̓	t̓ᶿét̓ᶿɛq̓	*mud*	Sl
h'. s-t̓ᶿiq̓əl	st̓ᶿiq̓əl	*mud*	Msq
i. tumiš	tú·mɩš ~ tó·mɩš	*man*	Sl
i'. s-taməx	stámɩx	*warrior*	Msq

3.2.2.1.3.3 Proposed Analysis

How do we account for the loss of the nominalizing s-prefix in Sliammon? What would happen if an s-prefix were posited? As observed in (49-51) above, Sliammon generally lacks Complex Onsets. If the constraint which bans complex onsets (*COMPLEX ONSET) is ranked above the constraint which requires a faithful parse of the prefix s-, then it would be better to delete the s-prefix than to violate the constraint which bans complex onsets, as shown by the partial ranking in (58) and the tableau in (59).

(58) *COMPLEX ONSET >> AFFIX FAITH (MAX)

(59) nəxʷiɬ [nʊ́xʷɩɬ ~ nʊ́xʷ:ɩɬ] *dugout canoe*

s-n[ʊ]xʷiɬ	*COMPLEX ONSET	AFFIX FAITH (MAX)
☞ a. <s-> nʊ́xʷɩɬ		*
b. s-nʊ́xʷɩɬ	*!	

This is discussed further in Chapter 5 in which the s-nominalizing prefix is compared with the plural /L'-/ prefix.

3.2.2.1.3.2 Root-Initial Consonant Clusters

If we assume that the distribution of schwa is predicted from the constraint ranking, contrast what happens to an initial C-prefix in Sliammon with what happens to CCVC Roots in the language.

3.2.2.1.3.2.1 Sliammon / hə́n̓q̓əmin̓əm̓ (Musqueam) Data

The Sliammon and Musqueam cognates in (60) show that Musqueam retains Root-initial complex clusters while Sliammon has an epenthetic [ə] between C_1 and C_2 of the Root.

(60) Sliammon / Musqueam Comparative Evidence

	Output	***Complex Onset**	**Gloss**	**Language**
a.	qʷə́ɬeʔ=šən	*qʷɬéʔ . šən	*shoe(s)*	Sl
a'.	qʷɬéy̓=xən		*shoe*	Msq
b.	q̓ə́ɬən	*q̓ɬə́n	*bow of boat*	Sl
b'.	sq̓ɬan		*bow of canoe*	Msq
c.	ƛ̓əxʷ-t	*ƛ̓xʷə́t	*beat s.o. in a contest*	Sl
c'.	ƛ̓xʷ-ət		*beat him in a game*	Msq
d.	t̓əqʷəm	*t̓qʷə́m	*thimbleberry*	Sl
d'.	t̓qʷəm		*thimbleberry*	Msq
e.	pəɬt	*pɬə́t	*thick (layer)*	Sl
e'.	pɬet		*thick*	Msq
f.	k̓ʷəš-t	*k̓ʷšə́t	*count it*	Sl
f'.	k̓ʷx-et		*count them*	Msq
g.	k̓ʷəɬ-t	*k̓ʷɬət	*spill it*	Sl
g'.	k̓ʷɬ-et		*spill it*	Msq

What we observe is that instead of deleting the first consonant of the Root, schwa always surfaces between C_1 and C_2 of the Root in Sliammon. CCVC Roots undergo epenthesis in Sliammon in order to avoid a violation of *COMPLEX ONSET, as illustrated above. This is in contrast to the treatment of the hypothetical cases discussed above which would involve deletion of a nominalizing prefix s-.

3.2.2.1.3.4.2 Proposed Analysis

If a speaker posits an Input such as /q̓ɬun/, the relative ranking of *COMPLEX ONSET and DEP[NUC] (the constraint which keeps track of the cost associated with schwa epenthesis) drives schwa epenthesis and selects candidate (61.a) over candidate (61.b).

(61) q̓ɬun q̓ə́ɬɔn *bow of the boat*

Input: q̓ɬun	COMPLEX ONSET	DEP[NUC]
☞ a. q̓ə́ɬun		*
b. q̓ɬún	*!	

The tableau in (62) shows that MAX[C] ROOT is also ranked higher than DEP[NUC] since deletion of either C_1 or C_2 of the Root in (62.b-c) is clearly less optimal than candidate (62.a) which involves schwa epenthesis.

(62) q̓ɬun q̓ə́ɬɔn *bow of the boat*

Input: q̓ɬun	ROOT FAITH: MAX-C ROOT	DEP[NUC]
☞ a. q̓ə́ɬun		*
b. <q̓>ɬún	*!	
c. q̓<ɬ>ún	*!	

Notice that is the speaker posits /q̓əɬun/ as the Input, then all three constraints are satisfied in the optimal candidate: q̓ə́ɬun.

By transitivity then, we have established the following partial constraint rankings:

(63)	*COMPLEX ONSET	>>	AFFIX FAITH (MAX)
	*COMPLEX ONSET	>>	DEP[NUC]
	*COMPLEX ONSET	>>	NO CODA
	MAX-C ROOT	>>	NO CODA
	MAX-C ROOT	>>	DEP[NUC]

The data in (64) establishes the relative ranking of DEP[NUC] and NO CODA Consider the status of the following CVC Roots which can appear as unaffixed stems.

(64) CVC Roots

	Input		Output	Gloss
a.	t̓in	t̓in	t̓ɛ́n	*barbecued fish*
b.	p̓iq̓	p̓iq̓	p̓ɛ́q̓	*wide*
c.	ƛ̓uqʷ	ƛ̓uqʷ	ƛ̓óqʷ	*hard*
d.	pukʷ	pukʷ	púkʷ	*book*
e.	tan	tan	tán ~ tʌ́n	*mother*
f.	man	man	mán ~ mʌn	*father*

Notice that Root Faithfulness and DEP[NUC] must dominate NO CODA since it is better to have a faithful parse of the coda consonant than to allow epenthesis, as shown in (65).

(65) t̓in [t̓ɛ́n] *barbecued fish (salmon)*

t̓in	ROOT FAITH	DEP[NUC]	NO CODA
☞ a. t̓in			*
b. t̓i . n[ə]		*!	
c. t̓i <n>	*!		

(66) Partial Constraint Ranking by Transitivity

*COMPLEX ONSET	>>	AFFIX FAITH (MAX)		
*COMPLEX ONSET	>>	DEP[NUC]	>>	NO CODA
ROOT FAITH: MAX-C ROOT	>>	DEP[NUC]	>>	NO CODA

The next section provides additional evidence for the lack of Complex Onsets in Sliammon.

3.2.2.1.4 Loan Words: Evidence for lack of Complex Onsets

The phonology of words borrowed into Sliammon from English also provides evidence that Complex Onsets are generally banned in the language. Compare the English words in (67.a-b) which contain complex onsets with the corresponding Sliammon loan words in (68.a-b).

(67) English Source

a. plʌ́mz *plums*

b. bróẃk *broke*

(68) Sliammon loan words

	Input		Output	Gloss
a.	plms	pəlməs	pə́lməs (~ pə́ləməs)	*plum, plums*
b.	plokʷ-it č	pəlokʷi(t) č	pə́lokʷɩč	*I'm broke* (no money)

In the Sliammon loans, the initial consonant cluster is avoided by the presence of [ə́], as shown by the output forms in (68.a-b).

The goal of the preceding section has been to establish the lack of Complex Onsets in the language. The next section addresses some apparent counter examples to this claim.

3.2.2.1.5 Apparent Exceptions to *Complex Onset

3.2.2.1.5.1 Initial sC sequences

The following examples which were uttered in isolation begin with word-initial consonant clusters and therefore appear to be counter examples to the generalization that Sliammon lacks Complex Onsets. All of these examples in (69-70) involve an initial s.

(69)

	Input	Output	Gloss
a.	s q̓ʷaǰim	sq̓ʷʌ́ǰɩm	*he's so poor, in poor health*
a".	s IMP-q̓ʷaǰim+ʔ	sq̓ʷáq̓ʷaǰɩm̓	*worse than poor, sickly*
b.	s kʷiči	skʷí·či	*bothersome, a nuisance*
c.	s nəq̓	snʌ́q̓ ~ sᵊnʌ́q̓	*dear, loved one*

(70) time expressions

	Input	Output	Gloss
a.	s čaʔat	sčɛ́ʔat	*now*
b.	s čan̓uɬ	sčɛ́ʔnɔɬ	*when?*
c.	s čam̓s	sčɛ́m̓s	*why?*
d.	s ǰasuɬ	sǰɛ́soɬ ~ sᵊǰɛ́soɬ	*yesterday*
e.	s t̓ᶿuk̓ʷ-'uɬ	st̓ᶿók̓ʷʊɬ	*at the end of a day*

Although each example involves a sequence of two consonants (sC) from a linear perspective, the claim which is made here is that these two consonants do not form a constituent (i.e. Complex Onset) within the domain of the Prosodic Word (PrWd).

Evidence that the initial s is segmentable is provided by the contrast between the data provided in (69-70) versus the data in (71) which lacks the initial s. Consider the contrast between the related words and phrases provided by one elder who consistently omits the initial s when she produces these words in isolation. Compare the data in (69-70) with the examples in (71) which lack the initial s- proclitic.

(71) Sliammon data

	Input	Output	Gloss
a.	q̓ʷaǰim	q̓ʷə́ǰɩm ~ q̓ʷə́ǰəm	*poor, poor in health*
b.	kʷiči	kʷíʔči	*bothersome*
c.	čam̓ ga	čɩm̓ᵊgʌ ~ čɩm̓ᵊga	*why?*
c'.	čam̓ čxʷ ga	čɩ́m̓ čxʷ ᵊ ga	*what's the matter?*
d.	ǰasuɬ	ǰέsoɬ	*yesterday(cf. sǰέsɔɬ)*
e.	t̓ᶿuk̓ʷ	t̓ᶿók̓ʷ	*today (cf. st̓ᶿók̓ʷ)*
e'.	IMP-t̓ᶿuk̓ʷ-INC	t̓ᶿót̓ᶿok̓ʷùk̓ʷ	*breaking daylight*

Since this s proclitic is a sentence-level constituent and is not part of the word, it is omitted in (71.a-e) when the word is pronounced in isolation. When the word occurs in a sentential context, the initial s reappears, as in (72.a'-a") and (72.d). The form in (72.c) shows that the non-reduced form of this phrase involves ʔəs and that the s is syllabified as the coda of the first syllable; compare this with (71.c) above.

(72) Sliammon data

	Input	Output	Gloss
a.	q̓ʷaǰim	q̓ʷə́ǰɩm ~ q̓ʷə́ǰəm	*poor*
a'.	hi hw s q̓ʷaǰim təy̓ta tumiš	hέhεw sq̓ʷə́ǰɩm tíʔtə túmɩš	*He's a really poor man*
a".	hi hw č ʔə kʷ s q̓ʷaǰim	hέ:hεwč (ʔə) kʷs q̓ʷə́ǰɩm	*I'm poor (really tired)*
b.	kʷiči	kʷíʔči	*bothersome*
c.	ʔəs č̓aʔat	ʔəsč̓έʔʌtʰ ʔəs . č̓έʔ . ʔʌt	*now*
d.	hi hw kʷ s čaʔanuɬ	hέ:w kʷs čέʔanɔɬ	*when was it?*
e.	čam̓ ga	čɩm̓ ᵊ gʌ ~ čɩm̓ ᵊ ga	*why?*
e'.	čam̓ čxʷ ga	čɩ́m̓ čxʷ ᵊ ga	*what's the matter?*

f. ǰasuɬ	ǰέsoɬ	*yesterday*
f'. s ǰasuɬ	s . ǰέs . soɬ	*yesterday*
g. t̓ᶿuk̓ʷ	t̓ᶿók̓ʷ	*today*
g'. IMP-t̓ᶿuk̓ʷ-INC	t̓ᶿót̓ᶿok̓ʷùk̓ʷ	*breaking daylight*
h. mamaɬa	mamaɬa	*white person*
h'. sq̓ s mamaɬa-s	sʌ́q̓ smámʌɬʌs	*s/he's a half breed*

In (72.f-f') this speaker produces both ǰέsoɬ ~ s.ǰέsoɬ for *yesterday* but clearly considers the initial s in the second variant outside of the domain of the first syllable, as indicated by the judgements regarding syllabification.

A single consonant such as s which is not syllabified as part of the initial Onset, is proposed to be licensed moraically, as shown in (73) below (cf. Bagemihl 1991 on moraic licensing in Bella Coola).

(73)

a. s_{μ} (ǰá$_{\mu}$s$_{\mu}$. sɔɬ$_{\mu}$)

It should be noted that the elder who systematically omits the initial s in (71) above did produce two words with the initial sC.

(74)

	Input		Output	Gloss
a.	s qʷay	s qʷay	sqʷáy ~ sqʷʌ́y	*telephone*
b.	s kʷǰ̓-'uɬ	s kʷiʔǰuɬ	skʷíʔǰoɬ ~ skʷíʔǰʊɬ	*this morning*

Unfortunately, these two examples have not been systematically tested with other consultants nor have they been tested in different syntactic environments in order to determine the nature of the initial s. Recall that there are a number of sources for initial s: nominalizing prefix s- which has generally been lost, the proclitic s found in subordinate clauses, and a reduced form of ʔəs/ʔas.

The explanation for the existence of sC initial words involves a complex set of factors, such as those in (75).

(75)

- there are a number of s's which precede the stem in linear string
- Markedness: coronal s often found as an exception cross-linguistically
- Existence of word-internal sC onsets to satisfy metrical constraints
- Contact with other Salish-speaking peoples where s-nominalizer is preserved
- Increasing use of English which has many sC-initial words

What is clear is that Sliammon lacks word-initial CC onsets which do occur in many other Salish languages. Ranking of *COMPLEX ONSET relatively high, but as with all constraints it can be violated if constrained to do so by some higher-ranking conflicting constraint. A case in point will be discussed in §3.2.2.6.1.

3.2.2.1.5.2 Clitic Initial Constructions

The following clitic-initial constructions in the language also appear to be exceptions to the proposal that Sliammon lacks Complex Onsets. These constructions are particularly interesting since the first position in the phrase is typically occupied by the predicate or verbal auxiliary. As shown by the data in (76-78), the subject clitics are the first element in the linear string. In fact, the subject clitic is followed by another second position clitic (k^wu, k^wiʔ, k^waʔ) which indicates that the entire clitic group occupies this first position.

These constructions are of interest from a phonological perspective since we need to determine how these phrase-initial consonants are licensed? The output forms in (76.a-g) were recorded with a very brief excrescent schwa following the clitic which seems to suggest that these clitics are not syllabified with the following syllable, and therefore do not violate

*COMPLEX ONSET. The data in (76) involves the first person subject clitic č and the clitic kʷu whereas (77) involves combination of č with kʷiʔ.

(76) First Person (sg) Subject Clitic: č *I* (usually an enclitic)

	Input	**Output**	**Gloss**
a.	č kʷu kʷan=nač-it	čᵊ kʷu kʷáʔᵃnæčit	*I'm sitting down*
b.	č kʷu ʔiɬtan-it	čᵊ kʷu ʔɛ́ɬta·nit	*I've eaten*
c.	č kʷu ƛ̓um	čᵊ kʷu ƛ̓óm	*I've had enough; I'm almost there*
d.	č kʷu q̓aq̓əm	čᵊ kʷu q̓áq̓ʌm	*I'm hungry*
e.	č kʷu ƛ̓əčt-am	čᵊ kʷu ƛ̓ɩ́čtam	*I'm sleepy*
f.	č kʷu č̓əm̓č̓am̓-əm	čᵊ kʷu č̓ɩ́m̓č̓ɛʔᵋməm	*I'm cold; I've gotten cold*
g.	č kʷu qʷəl̓ gč̓=iqʷan-m	čᵊ kʷu qʷʌ́l̓ gʌ́ʔč̓ɛ́qʷʌnəm	*I've gone bald*
h.	č kʷu č̓ag-uxʷ-an	č kʷu č̓ɛ́guxʷɩn	*I've already helped him*
i.	č kʷu qʷəl̓ t̓ap=us	č kʷu qʷʌ́l̓ t̓ǽpos	*I'm getting (going) blind*
j.	č kʷu qʷəl̓ t̓ukʷ=an̓a	č kʷu qʷʌ́l̓ t̓úkʷaʔᵃna	*I'm getting (going) deaf*
k.	č kʷu ƛ̓ax̌-INC	č kʷu ƛ̓áx̌ax̌	*I'm getting old*
l.	č kʷu č̓ag-uxʷ-an	č kʷu č̓ɛ́·guxʷɩn	*I've helped him already*

(77) First Person (sg) Subject Clitic: č *I*

	Input	**Output**	**Gloss**
a.	č kʷy̓ č̓ag-uxʷ-an	č kʷiʔ č̓ɛ́·guxʷɩn	*I've helped him* (just now)
b.	č kʷy̓ č̓ag-t-'uɬ	č kʷiʔ č̓ɛ́·gatoɬ	*I've already helped him*
b'.	č kʷy̓ č̓ag-t-an-'uɬ	č kʷiʔ č̓ɛ́·gatanoɬ	*I've already helped him*
c.	č kʷy̓ kʷan=iws-it	č kʷíʔ kʷánewsìtʰ	*I already rested*
d.	č kʷy̓ ʔiɬtan-it-'uɬ	č kʷiʔ ʔɛ́ɬtənʔitoɬ	*I've already eaten*
e.	č kʷy̓ huy̌	č kʷiʔ hóy	*I'm finished*

(78) First Person (sg & pl) Forms: č *I* ; št *we*

	Input	Output	Gloss
a.	č kʷaʔ ʔəǰ̉-INC (stv.?)	č kʷaʔ ʔáʔᵊǰi	*I'm all better now*
b.	č kʷaʔ ta(ʔ)gam-it	č kʷaʔ táʔgam̀itʰ	*I announced it*
c.	čxʷ kʷaʔ ʔəǰ̉-INC	čxʷ kʷáʔ ʔáʔᵊǰi	*you're all better*
d.	št kʷaʔ ʔəǰ̉-INC	št kʷaʔ ʔáʔᵊǰi	*we're all better*
e.	št kʷaʔ tag-am-it-'uɬ	št kʷaʔ tágam̀itoɬ	*We announced it*

3.2.2.1.5.3 Discussion and Proposed Analysis

It is proposed here that the sentence-initial clitic č is licensed moraically, as evidenced by the excrescent schwa which accompanies the release of this consonant. In particular, č is not the first member of a complex onset, and therefore does not constitute a violation of the constraint *COMPLEX ONSET. As will be argued in §3.2.2.3, Sliammon has obstruent-only syllables of the form CCμ. The other subject clitics čxʷ and št are proposed to form minor syllables. Since these clitics are unstressed, and schwa epenthesis is proposed to occur within the domain of the stem in order to satisfy PROPER HEADEDNESS at the level of the Foot, these CC syllables are licensed without containing a vocalic nucleus.

3.2.2.1.6 Word-Internal Complex Onsets

3.2.2.1.6.1 The Problem

In the previous sections, it is argued that Sliammon generally lacks word-initial and word-internal Complex Onsets. The next section presents a systematic set of cases in which *COMPLEX ONSET is violated, as shown by the data in (79). A word-internal st- cluster is parsed as a Complex Onset rather than spanning two different syllables, as shown by a comparison of the grammatical and ungrammatical examples in (79).

(79) Word-internal sC- Onsets and the Causative Suffix /-stg/

		Output	Gloss
a.	ǰəƛ̓-st-agɬ	ǰíƛ̓ . stawɬ	*have a race* (with e.o.)
a'.		*ǰíƛ̓s . tawɬ	
b.	k̓ʷən-stu-mi č	k̓ʷʊ́n . sto . mɩč	*I'll show it to you*
b'.		*k̓ʷʊ́ns . to . mɩč	
c.	k̓ʷən-st-anaq	k̓ʷʊ́n . sta . nʌq .	*person who shows off*
c'.		*k̓ʷʊ́ns . ta . nʌq .	
d.	k̓ʷi-k̓ʷən-st-ana-mut	k̓ʷí . k̓ʷən . stà: . nàʔ . mot	*he's really showing off*
d'.		*k̓ʷí . k̓ʷəns . tà: . nàʔ . mot	
e.	IMP-tiwšam-st-anaq	tí . tiw . šɛ̀m . stʌ̀n . nʌq	*teaching*
e'.		*tí . tiw . šɛ̀ms . tʌ̀n . nʌq	
f.	IMP-tiwšam-stu-mi č	tí . tiw . šɛ̀m . stò . mɩč	*I'm teaching you*
f'.		*tí . tiw . šɛ̀ms . tò . mɩč	

Compare the data in (71) with the data in (79) (both data sets from a single speaker), which show that there is an asymmetry between word-initial syllables versus word-internal syllables. The problem then is how do we account for the contexts in which Complex Onsets are banned, and the contexts in which Complex Onsets are permitted?

All of the examples in (79) involve the Causative Marker /stg-/. The surface st- Onsets occur in both stressed and unstressed syllables so that an explanation for their distribution cannot be attributed to whether or not they occur in a strong/weak metrical position.

3.2.2.1.6.2 Proposed Analysis

These examples receive a principled explanation within an Optimality theoretic grammar given constraint ranking, conflict and minimal violation. The constraint which bans complex onsets (*COMPLEX ONSET) is violated in order to satisfy some higher-ranked constraint(s) within the grammar. Consider the following analysis which is proposed here in order to account for the data in (79).

Some morphemes prefer to be aligned with the edge of a relevant prosodic category rather than being parsed into different prosodic constituents (cf. McCarthy and Prince (1993b) on Generalized Alignment). I propose the following language-specific instantiation of Alignment which ensures that the left-edge of the Causative morpheme is aligned with the left-edge of a syllable, as in (80).

(80) ALIGN L [CAUS, σ]

Align the left edge of the Causative morpheme with the left edge of a syllable.

Consider the following representations which illustrate how satisfaction of this constraint works. The representation in (81.a) violates ALIGN L since the causative morpheme is parsed into two different syllables, whereas the representation in (81.b) satisfies the constraint since the causative morpheme is aligned with the left-edge of a syllable. The example in (81.a'-b') illustrates how this applies to the form: ǰəƛ̓-st-awɬ *have a race with each other*, repeated here from (79.a).

(81)

Violates ALIGN L	Satisfies ALIGN L
a. * stem-s] [t... σ] [σ	b. stem] [-st... σ] [σ
a'. *ǰíƛ̓s . tawɬ	b'. ǰíƛ̓ . stawɬ

The optimal output satisfies ALIGN L at the cost of violating *COMPLEX ONSET, as shown by the tableau in (82).

(82) k̓ʷən-st-anaq [k̓ʷʊ́n . <u>st</u>a . nʌq] *person who shows off*

k̓ʷən-st-anaq	ALIGN L [CAUS, σ]	*COMPLEX ONSET
☞ a. k̓ʷə́n . sta . nʌq		*
b. k̓ʷə́ns . ta . nʌq	*!	

In addition, if all coda consonants are moraic as argued in §3.1, then syllabifying VCCCV as VCC . CV will create a structure a preceding trimoraic syllable whereas syllabifying the same string as VC . CCV. does not. Notice that the output candidate which violates *COMPLEX ONSET also creates more optimal Foot structure. Consider the following metrical structures in (83) which illustrate this point (cf. §3.3 on Metrical Structure in the language).

(83)

	a. ǰƛ̓-st-agɬ	[ǰɪ́ƛ̓stawɬ ~ ǰɪ́ƛ̓stʌwɬ]	*have a race; race e.o.*
☞	a'.	(ǰə́ƛ̓$_{\mu}$. stʌw$_{\mu}$ɬ$_{\mu}$)	*COMPLEX ONSET
	a''.	*(ǰə́ƛ̓$_{\mu}$s$_{\mu}$. tʌw$_{\mu}$ɬ$_{\mu}$)	*(μμμμ)Ft
	a'''.	*(ǰə́ƛ̓$_{\mu}$s$_{\mu}$) (tʌ̀w$_{\mu}$ɬ$_{\mu}$)	*CLASH
	b. k̓ʷn-stu-mi č	[k̓ʷʊ́nstomɪč]	*I'll show it to you*
☞	b'.	(k̓ʷə́n$_{\mu}$. sto$_{\mu}$. mɪč$_{\mu}$)	*COMPLEX ONSET
	b''.	*(k̓ʷə́n$_{\mu}$s$_{\mu}$. to$_{\mu}$. mɪč$_{\mu}$)	*(μμμμ)Ft
	b'''.	*(k̓ʷə́n$_{\mu}$s$_{\mu}$)(tò$_{\mu}$. mɪč$_{\mu}$)	*CLASH
	c. k̓ʷn-st-anaq	[k̓ʷʊ́nstʌnəq]	*s.b. who shows off*
☞	c'.	(k̓ʷə́n$_{\mu}$. sta$_{\mu}$. nəq$_{\mu}$)	*COMPLEX ONSET
	c''.	*(k̓ʷə́n$_{\mu}$s$_{\mu}$. ta$_{\mu}$. nəq$_{\mu}$)	*(μμμμ)Ft
	c'''.	*(k̓ʷə́n$_{\mu}$s$_{\mu}$)(tà$_{\mu}$. nəq$_{\mu}$)	*CLASH

	d. IMP-tiwš-am-stu-mi č	[títiwšɛ̀mstòmɩč]	*I'm teaching you*
☞	d'.	(tí$_{\mu}$. ti$_{\mu}$w$_{\mu}$)(šɛ̀$_{\mu}$m$_{\mu}$)(stò$_{\mu}$. mɩč$_{\mu}$)	*COMPLEX ONSET
	d".	*(tí$_{\mu}$)(ti$_{\mu}$w$_{\mu}$)(šɛ̀m$_{\mu}$s$_{\mu}$)(tò$_{\mu}$)(mɩč$_{\mu}$)	*($\mu\mu\mu$)σ
	d'".	*(tí$_{\mu}$. ti$_{\mu}$w$_{\mu}$)(šəm$_{\mu}$s$_{\mu}$)(to$_{\mu}$. mɩč$_{\mu}$)	*v-reduction

As shown by the syllabification and Foot structure presented in (83.a"), if the s were syllabified with the preceding syllable, this would also have the effect of increasing the moraic count of the entire word. In fact (83.a") is ill-formed because the Foot contains four moras (a non-minimal violation of FTBIN). The constraint ranking must also rule out candidate (83.a'") in which there are two adjacent Feet. By comparing the output candidate in (83.a') with (83.a'"), it seems that creating a bi-syllabic tri-moraic Foot is more highly valued than a sequence of two bi-moraic mono-syllabic feet - in other words, the amount of phonological material which occurs within the Foot domain is maximized, and this results in the violation of the lower-ranked *COMPLEX ONSET constraint. In addition, adjacent stressed syllables (*CLASH) are avoided[4].

This section presents evidence that *COMPLEX ONSET is violated in order to ensure that the causative morpheme is aligned with the edge of a syllable. By observing the ungrammatical examples in (83.a'"-d'"), failure to properly Align this suffix would also create structures in which the causative morpheme straddles not only two syllables but also two Feet. CRISP ALIGNMENT is therefore satisfied at the expense of a *COMPLEX ONSET violation.

[4]The constraint *CLASH is not an undominated constraint in Sliammon. It can be violated just in case the word is comprised of a Root and following bisyllabic LS, such as q^{w}up=iθx̌an [q^{w}ó:pèθx̌ʌn] *hair under arms;* tih=uθin [tí:hòθɛn] *big mouth* ; sil=aw̓tx^{w} [sé:làwtx^{w} ~ sé:làwtẉ] *tent* . In these cases, it is more important to stress the adjacent lexical heads than it is to satisfy the constraint which disprefers adjacent feet (*CLASH).

3.2.2.2 Establishing Maximal syllable size: *Complex Coda

It appears to be relatively easy to establish the simple syllable types in the language; however, it becomes more difficult to establish the upper limits on the size and shape of syllables in Sliammon.

3.2.2.2.1 The Data

Given the Nuclear Moraic Model of Shaw (1993 et seq.), if schwa is nuclear and non-moraic in contrast to full vowels which are Nuclear and moraic, then we predict an asymmetry between number of coda consonants licensed by schwa versus the number of coda consonants licensed by a full vowel. Further, if feet are optimally bimoraic in the language (i.e. they satisfy FTBINμ), then we expect to find (CəCC) and (CAC) Feet. This is in fact the case, as shown by the data in (84-85) which involve mono-morphemic words in the language.

(84) CəCC

	Input		Output	Gloss
a.	t̓kʷs	t̓əkʷs	t̓ʊ́kʷs	*to burst; gun shot*
b.	ƛ̓č̓t	ƛ̓əč̓t	ƛ̓ə́č̓t	*sleep*
c.	ƛpxʷ	ƛəpxʷ	ƛə́pxʷ	*break*
d.	mθkʷ	məθkʷ	mə́θkʷ	*blackcap berry*
e.	pɬt	pəɬt	pə́ɬt	*thick*
f.	x̌t̓k̓ʷ	x̌ət̓k̓ʷ	x̌ə́t̓k̓ʷ	*design, carved*
g.	ɬm̓t	ɬəm̓t	ɬə́m̓t	*to weave*
h.	qmk̓ʷ	qəmk̓ʷ	qə́mk̓ʷ	*capsize, tip over*
i.	č̓px̌	č̓əpx̌	č̓ə́px̌	*dirty*

(85) CAC

	Input	Syllabification	Output	Gloss
a.	t̓in	t̓in	t̓ɛ́n	*barbecued salmon*
b.	p̓iq̓	p̓iq̓	p̓ɛ́q̓	*wide*
c.	čuǰ̓	čuy̓	čúy̓	*child*
d.	t̓ᶿuk̓ʷ	t̓ᶿuk̓ʷ	t̓ᶿók̓ʷ	*day, light, bright*
e.	man	man	mán ~ mʌ́n	*father*
f.	tan	tan	tán ~ tʌ́n	*mother*
g.	qʷay	qʷay	qʷáy	*talk, speak*

The data in (84-85) above satisfy the constraints SYLL NUC and SYLL MORA, as well as the constraint $*[\mu\mu\mu]_\sigma$ which assigns a cost associated with super-heavy syllables.

(86)

SYLL NUC	Syllables have vocalic nuclei	(P&S 1993)
SYLL MORA	Syllables have phonological weight	(Shaw 1995, 1996)
$*[\mu\mu\mu]_\sigma$	Syllables are not trimoraic	

CəCC syllables do incur a *COMPLEX CODA violation, but do so in order to satisfy the high-ranking Root Faithfulness constraints.

Now consider the following data which contain trimoraic CACC syllables. Notice that these examples involve mono-morphemic Roots in the language, as opposed to trimoraic syllables which may arise as a result of morphological concatenation. As will be shown in §3.2.2.2.3, trimoraic syllables are avoided when they arise across a morpheme boundary whereas they are licit in the mono-morphemic forms in (87).

(87) CACC

	Input	Output	Gloss
a.	k̓ʷiχ̓t	k̓ʷέχ̓tʰ	*upstream area*
b.	piwɬ	péwɬ	*rendered fat, lard*
c.	kiks	kíks	*cookie*
d.	xʷukʷt	xʷúkʷtʰ	*nothing, none*
e.	kʷum̓t	kʷúm̓tʰ	*kelp*
f.	čapθ	čέpθ	*aunt, uncle*
g.	ʔasxʷ	ʔásxʷ	*seal*
h.	ʔaqʷt	ʔáqʷtʰ	*downstream area*

The examples in (87) entail that ROOT FAITH outranks the constraint which bans trimoraic syllables.

(88) ROOT FAITH >> $*\mu\mu\mu]_\sigma$

(89) kʷum̓t [kʷúm̓t] *kelp*

Input: kʷum̓t	ROOT FAITH	$*[\mu\mu\mu]\sigma$
☞ a. kʷúm̓t		*
b. kʷúm̓<t>	*!	
c. kʷú<m̓>t	*!	

The optimal candidate in (89.a) violates the constraint against trimoraic syllables ($*[\mu\mu\mu]_\sigma$) in order to satisfy the higher-ranking Root Faithfulness constraints which ensures that there is a correspondence relation between the Input and the Output.

Notice also that although schwa epenthesis takes place for purposes of stress assignment (cf. §4), schwa epenthesis does not occur in order to break up the final consonant cluster, as in (90).

(90)

	Input	Output		Gloss
a.	k̓ʷiƛ̓t	k̓ʷéƛ̓t	*k̓ʷíƛ̓[ə]t	*upstream area*
b.	piwɬ	péwɬ	*píw[ə]ɬ	*rendered fat, lard*
c.	kiks	kíks	*kík[ə]s	*cookie*
d.	xʷukʷt	xʷúkʷt	*xʷúkʷ[ə]t	*nothing, none*
e.	kʷum̓t	kʷúm̓t	*kʷúʔm[ə]t	*kelp*
f.	čapθ	čɛ́pθ	*čɛ́p[ə]θ	*aunt, uncle*
g.	ʔasxʷ	ʔásxʷ	*ʔás[ə]xʷ	*seal*
h.	ʔaqʷt	ʔáqʷt	*ʔáqʷ[ə]t	*downstream area*

3.2.2.2.2 Proposed Analysis

Schwa epenthesis into a Root not only incurs a DEP[NUC] violation but also violates O-CONTIGUITY of the Root which ensures that the contiguity relations in the Output are in correspondence with the contiguity relations in the Input (cf. McCarthy and Prince (1995:371) and Lamontagne (1996)on Contiguity). This effectively assigns a cost associated with insertion into the Root which interrupts the contiguity of the string. If O-CONTIG ROOT dominates DEP[NUC], then schwa epenthesis will be prevented within the Root unless constrainted to do so by some higher-ranking constraint (cf. §3.2.2.3 where ROOT CONTIGUITY is violated in order to satisfy PROPER HEADEDNESS). Consider the tableau in (91) which shows the effects of this partial ranking.

(91) čapθ [čɛ́pθ] parent's sibling; aunt, uncle

čapθ	O-CONTIG ROOT	DEP[NUC]
☞ a. čápθ		
b. čáp[ə]θ	*!	*

Contiguity must also dominate the constraint which bans trimoraic syllables, as shown by a comparison of the candidates in (92).

(92) čapθ [čɛ́pθ] *parent's sibling; aunt, uncle*

Input: čapθ	ROOT FAITH	O-CONTIG RT	$*[\mu\mu\mu]\sigma$	DEP[NUC]
☞ a. $\check{c}\acute{a}_{\mu}p_{\mu}\theta_{\mu}$			*	
b. $\check{c}\acute{a}_{\mu}$ $p[\partial]\theta_{\mu}$		*!		*
c. $\check{c}\acute{a}_{\mu}p_{\mu}<\theta_{\mu}>$	*!			
d. $\check{c}\acute{a}_{\mu}<p_{\mu}>\theta_{\mu}$	*!			

Notice that this is different from what happens across a Root/Affix boundary, as shown by the data in the following section.

3.2.2.2.3 Diminutive Reduplication and $*\mu\mu\mu]\sigma$

The next section shows that morphologically-triggered vowel deletion associated with Diminutive reduplication is blocked in cases where this would otherwise create super-heavy CACC syllables.

3.2.2.2.3.1 Diminutive Reduplication

In CV- diminutive reduplication, the Root vowel is deleted as shown by the data in (93), and discussed in Davis (1970), Kroeber (1989), Blake (1992), Watanabe (1994, 2000).

(93) Diminutive Reduplication

	Input		**Output**	**Gloss**
a.	x̌ʷil̓m	x̌ʷil̓əm	x̌ʷɛ́ʔᵊlʌm	*rope*
a'.	DIM-x̌ʷil̓[-i-]m+[ʔ]	x̌ʷi-x̌ʷlim̓	x̌ʷɛ́x̌ʷlɛm̓	*string, thread*
b.	x̌ʷus-m	x̌ʷusəm	x̌ʷɔ́sɔm ~ x̌ʷɔ́sʌm	*soapberry*
b'.	DIM-x̌ʷus[-i-]m+[ʔ]	x̌ʷu-x̌ʷsim̓	x̌ʷɔ́x̌ʷsɪm̓	*small soapberry*
c.	t̓ᶿum=aǰ̓u	t̓ᶿumaʔǰu	t̓ᶿɔ́maʔǰʊ	*barnacle*
c'.	DIM-t̓ᶿum=aǰ̓u=uɬ+[ʔ]	t̓ᶿu-t̓ᶿmaǰuʔuɬ	t̓ᶿɔ́t̓ᶿᵊmaǰuʔɔ̀ɬ	*small barnacle*
d.	qʷasm	qʷasəm	qʷásəm	*flower*
d'.	DIM-qʷasm+[ʔ]	qʷa-qʷsəm̓	qʷáqʷsəm̓	*little flower*
e.	č̓an̓u	č̓an̓u	č̓ɛ́ʔno	*dog*
e'.	DIM-č̓an̓u+[ʔ]	č̓a-č̓nuʔ	č̓ɛ́č̓noʔ	*little dog*
f.	yax̌ay	yax̌ay	yʌ́x̌ʌy	*clam basket*
f'.	DIM-yax̌ay+[ʔ]	ya-yx̌ay̓	yɛ́yᵊx̌ʌy̓	*small basket*

Vowel deletion associated with Diminutive Reduplication is blocked if it creates a sequence of three consonants following the full vowel (i.e. a trimoraic syllable), as shown by the contrast between the data in (94.a'-d') and the ungrammatical examples in (94.a"-d").

(94)

	Input		**Output**	**Gloss**
a.	walθ	walθ	wálθ	*bullfrog*
a'.	DIM-wal[-i-]θ+[ʔ]	wa-waʔ . liθ	wáwaʔlɪθ	*baby bullfrog*[5]
a".		*wa-wʔ . liθ		*μμμ]σ
a'''.		*wa-w . l̓iθ		*R'/Onset

[5] B.Wilson (p.c.) has also documented wáw̓ləθ for the diminutive of bullfrog.

b. čayš	čayəš	čéyɩš ~ čɛ́yɩš	*arm, hand*
b'. DIM-čay[-i-]š+[ʔ]	ča-čaʔ . yiš	čɛ́čɛy̓ɩš	*small hand*
b''.	*ča-čʔ . yiš		*μμμ]σ
b'''.	*ča-č . y̓iš		*R'/Onset
c. kʷum̓t	kʷum̓t	kʷúm̓tʰ	*kelp*
c'. DIM-kʷum̓t=uɬ+[ʔ]	kʷu-kʷum . tuɬ	kʷúkʷumtʊ̀ɬ	*small kelp*
c''.	*kʷu-kʷm . tuɬ		*μμμ]σ
d. q̓aykʷ	q̓aykʷ	q̓ə́ykʷʰ	*bald eagle*
d'. DIM-q̓aykʷ=uɬ+[ʔ]	q̓a-q̓ay . kʷ-uɬ	q̓áq̓aykʷʊ̀ɬ	*young eagle*
d''.	*q̓a-q̓y . kʷuɬ		*μμμ]σ

Candidates (94.a'''-b''') are ruled out by the high-ranking constraint which bans glottalized resonants in Onset position. Candidates (94.c''-d'') also involve sonority reversals within the coda: (94.c'') *kʷukʷm . tuɬ and (94.d'') *q̓aq̓y . kʷuɬ.

The following mono-syllabic Roots also retain the Root vowel, as shown by the data in (95). These CVC stems take the Ci- diminutive prefix, a fact which is also noted by Watanabe (2000). The ungrammatical forms in (95.a''-c'') show that deletion of the Root vowel would create hetero-morphemic trimoraic syllables of the from CA-CC.

(95)

Input		**Output**	**Gloss**
a. pukʷ	pukʷ	púkʷ	*book*
a'. DIM-pukʷ	pi-pukʷ	pépukʷ	*small book*
a''.	*pi-pkʷ		*μμμ]σ
b. ƛ̓əp / ƛ̓p	ƛ̓əp	ƛ̓ə́p	*deep*
b'. DIM-ƛ̓əp	ƛ̓i-ƛ̓əp	ƛ̓íƛ̓əp	*little bit deep*
b''.	*ƛ̓i-ƛ̓p		*μμμ]σ

c. k̓ʷas	k̓ʷas	k̓ʷás ~ k̓ʷʌs	*hot*
c'. DIM-k̓ʷas	k̓ʷi-k̓ʷas	k̓ʷék̓ʷʌs	*little bit hot*
c''.	*k̓ʷi-k̓ʷs		$*\mu\mu\mu]\sigma$

As observed in this section there is a general constraint against super-heavy syllables in Sliammon as shown by the Diminutive examples in (94-95). Mono-morphemic Roots of the shape CVCC violate the constraint $*\mu\mu\mu]_\sigma$ in order to satisfy the constraints on Root Faithfulness. As argued in (91-92) above, mono-morphemic Roots do not take schwa epenthesis either, due to the relatively high-ranking constraint on Root O-Contiguity.

Having discussed both simple syllable structure in Sliammon, and the constraints on maximal syllable size, consider the following residual issue.

3.2.2.3 Asymmetry between beginning of words and ends of words

One of the properties which characterizes Sliammon words is that the beginnings of words are restricted to a single consonant before the stressed vowel, as in (96).

(96)

Input		Output	Gloss
a. kʷiškʷiš	kʷiškʷiš	kʷíškʷiš	*Steller's jay*
b. k̓ʷut̓a	k̓ʷut̓a	k̓ʷút̓a	*barbecue stick*
c. k̓ʷas	k̓ʷas	k̓ʷás	*hot*
d. mq̓ʷt̓ᶿ	m[ə́]q̓ʷt̓ᶿ	mʌ́q̓ʷt̓ᶿ ~ máʔqʷt̓ᶿ	*onion, wild onion*

Contrast this with what happens at the ends of words. As can be observed from the data in (97), words in Sliammon often end in long string of consonants.

(97)

	Input		Output	Gloss
a.	t̓ᶿamqʷL	t̓ᶿamqʷɬ	t̓ᶿámqʷɬ	*cloud*
a'.			*t̓ᶿámqʷəɬ	
b.	saɬtxʷ	saɬtxʷ	sáɬtxʷ ~ sáɬtw̥	*woman*
b'.			*sáɬtəxʷ	
c.	q̓txʷ	q̓əʔtxʷ	q̓ʌ́ʔtxʷ ~ q̓áʔtxʷ	*to burn (fire)*
c'.			*q̓aʔtəxʷ	
d.	IMP-q̓txʷ	q̓əq̓txʷ	q̓áq̓txʷ	*burning*
d'.			*q̓áq̓təxʷ	
e.	puʔpxʷ	puʔpxʷ	púʔpxʷ	*kindling*
e'.			*púʔpəxʷ	

How do we explain this observed asymmetry? Why is there only ever a single consonant at the beginning of words in Sliammon but the language tolerates many consonants word-finally? In particular, examples like those in (97.a-e) clearly exceed the constraints on maximal syllables established in §3.2.2 above.

In Blake (1992), these extra consonants are treated as extrametrical; however, it was necessary to admit more than a single consonant at the right-hand edge of the word. Since extrametricality is typically limited to a single consonant or prosodic unit at the edge of a domain, treating these consonants as "extrametrical" seems somewhat questionable.

3.2.2.3.1 Minor Syllables in Sliammon

Syllabification of these examples in (98) Column 2 shows that the final CC is systematically treated as a separate constituent. The syllable boundary is marked with a period, and reflects the judgements of Sliammon speakers.

(98)

	Input	Syllabification	Output	Gloss
a.	t̓ᶿamqʷL	t̓ᶿam . qʷɬ	t̓ᶿámqʷɬ	*cloud*
b.	saɬtxʷ	saɬ . txʷ	sáɬtxʷ ~ sáɬtw̥	*woman*
c.	q̓txʷ	q̓əʔ . txʷ	q̓ʌ́ʔtxʷ ~ q̓áʔtxʷ	*to burn (fire)*
d.	IMP-q̓txʷ	q̓əq̓ . txʷ	q̓áq̓txʷ	*burning*
e.	puʔpxʷ	puʔ . pxʷ	púʔpxʷ	*kindling*

Shaw (1993, 1995, 1996) discusses the role of minor syllables in Berber, Mon-Khmer, and Salish languages, with examples from Lillooet (St'at'imcets) and Bella Coola (Nuχalk). A minor syllable is comprised of an Onset consonant followed by a moraic coda consonant. Within Shaw's Nuclear Moraic Model which I adopt here, a minor syllable is mono-moraic, but non-nuclear.

(99)

```
      σ
     /|
    / μ
   /  |
  C   C
```

Blake (1995, 1999) claims that Sliammon has minor syllables, as shown by the data in (98).

Shaw (1996) also refers to minor syllables as "headless" syllables since they do not contain a nucleus. In her discussion of headless syllables and their interaction with stress, Shaw (1996: 4) states that a headless syllable has the following properties: (a) it cannot meet the requirements of either SYLL NUC or Proper Headedness at the level of the syllable, (b) it is constrained to metrically weak positions, and (c) it is mono-moraic (i.e. metrically light).

Notice that there is a kind of complementarity between the locus of stressed schwa and the occurrence of minor syllables in Sliammon. Sliammon has minor syllables - syllables which violate the constraint SYLL NUC. This means that schwa epenthesis is not driven by the constraint SYLL NUC otherwise we would expect all syllables in Sliammon to have vocalic nuclei. It is claimed here that epenthetic schwa in Sliammon is inserted in order to satisfy Proper Headedness at the level of the Foot. Shaw (1996.c) proposes that Proper Headedness is a family of three independent and rankable constraints, as defined in (100).

(100) Proper Headedness of Shaw (1996c:10) (cf. Ito and Mester 1992; Ola 1995)

a.	PROPHEAD $_{PW}$	A Prosodic Word is headed by a Foot	
b.	PROPHEAD $_{FT}$	A Foot is headed by a Syllable	
c.	PROPHEAD $_{\sigma}$	A Syllable is headed by a NUC	[=SYLL NUC]

As can be seen from the data in (98), minor syllables in Sliammon do not occur in a stressed syllable (i.e. as the head of a metrical foot). Furthermore, schwa epenthesis occurs between C_1 and C_2 of the Root, as shown in (101).

(101) č̓ɬ / č̓əɬ [č̓ɩɬ] *rain*

Input: č̓ɬ	PROPHEAD	DEP[NUC]
☞ a. č̓[ə́]ɬ		*
b. č̓ɬ	*!	

(102) č̓ɬ [č̓ə́ɬ] rain

Input: č̓ɬ	PROPHEAD	O-CONTIG ROOT
☞ a. č̓[ə́]ɬ		*
b. č̓ɬ	*!	

Evidence from §3.2.2.2 above shows that O-CONTIG ROOT >> DEP[NUC], therefore by transitivity the partial ranking in (103) is established.

(103) PROPHEAD >> O-CONTIG ROOT >> DEP [NUC]

Contrast this with an example like saɬtx^{w} [sáɬtx^{w}] *woman*.

(104)

Input: saɬtx^{w}	PROPHEAD	O-CONTIG ROOT	DEP[NUC]
☞ a. sáɬ . tx^{w}			
b. sáɬ . t[ə]x^{w}		*!	*

Notice that the optimal candidate in (104.a) violates SYLL NUC / PROPHEADσ since the final syllable lacks a vocalic Nucleus but that it does so in order to satisfy O-CONTIG ROOT.

In addition to minor syllables which occur within the domain of the Root, the subject clitics also surface as CC minor syllables, as shown by the data in (105-106). Judgements regarding syllabification are given by the speakers.

(105) word-final minor syllables

	Input		Output	Gloss
a.	qp-t-'uɬ a čxʷ	qə́p . tu . ɬà . čxʷ .	qʌ́ptoɬæ̀čxʷ	*Did you touch it?*
b.	x̌py̌-'uɬ a čxʷ	x̌ə́p . y̌u . ɬà . čxʷ .	x̌ʌ́py̌uɬæ̀čxʷ	*Did you turn back?*
c.	qmk̓ʷ-'uɬ a čxʷ	qə́m . k̓ʷu . ɬà . čxʷ .	qʌ́mk̓ʷuɬæ̀čxʷ	*Did you tip over?*

(106)

	Input	Foot/Output	*ə epenthesis	Gloss
a.	k̓ʷʔiš-it št	(k̓ʷə́ . ʔe) (šìt . štʰ)	*(k̓ʷə́ . ʔe) (šìt . šət)	*we're standing up*
b.	tg=qin-t-'uɬ št	(túw . qɛ) (tòɬ . štʰ)	*(túw . qɛ) (tòɬ . šət)	*we answered it*
c.	IMP-θiq=nač-'uɬ št	(θɛ́) (θɛ̀q. na) (č̓ùɬ. štʰ)	*(θɛ́) (θɛ̀q.na) (č̓ùɬ.šət)	*we're digging roots*
d.	IMP-q̓atᶿ-ag=mixʷ št [6]	(q̓á.q̓a)(t̓ᶿàw)(mìxʷ.štʰ)	*(q̓á.q̓a)(t̓ᶿàw)(mìxʷ.šət)	*we're gathering pl.*
e.	qms-t-'uɬ št	(qə́m . s[a]) (tòɬ . štʰ)	*(qə́m . s[a]) (tòɬ . šət)	*we stored it away*

Compare the output form in (106) Column 2 with the ungrammatical forms in (106) Column 3. As can be observed from the foot structure, the minor syllable ($št_{\mu}$) occurs in unstressed position. If schwa epenthesis in Sliammon is driven by the need to satisfy Proper Headedness, then it is unnecessary to epenthesize schwa into a metrically weak (non-head) position. Basically, schwa is epenthesized in order to be stressed.

3.2.3 Summary

This section provides the basic syllable structure to provide background for discussion regarding syllabification entailed in the remainder of the thesis.

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[6] This predicate means 'to gather people together from different places', and is related to the word k̲athaumixw 'a gathering together of different peoples' which is the name given to the International Choral Festival held in Powell River once every two years.

3.3 Introduction to Sliammon Metrical Structure

This section presents some of the basic properties regarding metrical structure in Sliammon. Although a complete analysis of Sliammon stress assignment is clearly beyond the scope of this thesis, the a number of the phonological properties of the language which are discussed in some detail (Schwa Epenthesis and Full Vowel Reduction) require some familiarity with the basic stress facts of the language. The most important generalization regarding stress in Sliammon for our present purposes relates to the position of primary stress.

3.3.1 Basic Observation: Primary Stress is Leftmost

Primary stress in Sliammon occurs on the first syllable of the stem, as shown by the data in (107). This is true of the vast majority of the data collected in this study, and accords well with the descriptive generalizations of Davis (1970), Kroeber (1989), Blake (1992) and Watanabe (1994, 2000). Primary stress is marked by an acute accent over the vowel in the stressed syllable (v́).

Primary stress is left-most, as shown by the data in (107).

(107)

	Input		Output	Gloss
a.	ƛ̓in̓a	ƛ̓iʔna	ƛ̓éʔna ~ ƛ̓én̓a	*oolichan oil*
b.	pilaq	pilaq	péilʌq^{h} ~ pélʌq^{h}	*bracket fungus, mushroom*
c.	k̓^{w}ut̓a	k̓^{w}ut̓a	k̓^{w}ót̓a ~ k̓^{w}út̓a	*barbecuing stick*
d.	k̓^{w}uʔux^{w}	k̓^{w}uʔux^{w}	k̓^{w}óʔox^{w} ~ k̓^{w}úʔʊx^{w}	*smoked salmon, fish*
e.	watla	watla	wát^{h}la ~ wát^{h}lʌ	*sweetheart*
f.	p̓al̓at̓$^{\theta}$	p̓al̓at̓$^{\theta}$	p̓ál̓ʌt̓$^{\theta}$	*skunk*
g.	pču	p[ə]ču	píču ~ pɩ́ču ~ péču	*cedar root basket*
h.	mnat̓$^{\theta}$i	m[ə]nat̓$^{\theta}$i	mə́nat̓$^{\theta}$ɛ	*drum*
i.	knika	k[ə]nika	kɩ́nikɛ ~ kɩ́nɛkʌ	*coloured person*

Primary stress also occurs on reduplicative prefixes, as shown by the data in (108.a-f). This provides evidence that the reduplicative prefixes (Plural, Diminutive, and Imperfective) in Sliammon are within the domain of the stem (cf. Davis (1970), Kroeber (1988, 1989), Blake (1992, in prep.) and Watanabe (1994, 2000) on Reduplication, and Sapir (1915) on Reduplication in Island Comox). See Appendix VII on the identification of the morphological stem domain.

(108)

	Input		**Output**	**Gloss**
a.	CəC$_{\text{PL}}$-mix̌aɬ	məx̌-mix̌aɬ	mʌ́x̌mɛx̌ʌɬ	*black bears*
a'.	mix̌aɬ	mix̌aɬ	mɛ́x̌ʌɬ	*black bear*
b.	DIM-ǰanxʷ[-i-]=uɬ+[ʔ]	ǰa-ǰn[i]xʷuɬ	ǰɛ́ǰnexʷùɬ	*small fish*
b'.	ǰanxʷ	ǰanxʷ	ǰɛ́nxʷ	*fish, salmon (generic)*
c.	DIM-CəC$_{\text{PL}}$-pukʷ	pi-pəkʷ-pukʷ	pé·pʊkʷpùkʷ	*lots of little books*
c'.	pukʷ	pukʷ	púkʷ	*book*
d.	DIM-CəC$_{\text{PL}}$-higus	hi-həw-higus	héhəwhègʊs	*small chiefs*
d'.	higus	higus	hɛ́gʊs ~ hégʊs	*chief*
e.	IMP-t̓ᶿuk̓ʷ-INC	t̓ᶿu-t̓ᶿuk̓ʷ-uk̓ʷ	t̓ᶿót̓ᶿok̓ʷùk̓ʷ	*breaking daylight*
e'.	t̓ᶿuk̓ʷ	t̓ᶿuk̓ʷ	t̓ᶿók̓ʷ	*day, light*
f.	IMP-ʔaǰušm̓-t-agɬ	ʔa-ʔaǰušəm̓tawɬ	ʔáʔaǰʊšəm̓tàwɬ	*exchanging gifts*
f'.	ʔaǰušm̓-t-agɬ	ʔaǰušəm̓tawɬ	ʔáǰʊšəm̓tàwɬ	*exchange gifts (e.o.)*

Stressed syllables in Sliammon tend to be markedly higher in pitch than their unstressed counterparts, a fact which is also discussed by Watanabe (2000). The observed pitch patterns are indicated in (109), where [H] indicates a syllable which bears a relatively high pitch, and [L] indicates a syllable which is lower in pitch.

(109)

	Input		Output	[pitch]	Gloss
a.	ʔimaθ	ʔimaθ	ʔέmʌθ	[HL]	*grandchild*
b.	ʔusa	ʔusa	ʔósa	[HL]	*blueberry*
c.	qaʔqa	qaʔqa	qáʔqa	[HL]	*mat, mattress*
d.	t̓gm	t̓[ə]g[ə]m	t̓ə́gəm	[HL]	*sun, moon*
e.	q̓snay̓	q̓[ə]snay̓	q̓ə́sᵊnʌy̓	[HL]	*dress, shirt*
f.	q̓g̓a	q̓[ə]ʔga	q̓áʔgʌ	[HL]	*cane, walking stick*

Although there does seem to be a strong correlation between high pitch and metrical prominance, J.Davis (1970) observes that pitch and stress can also occur independently of one another. The reader is also referred to Watanabe (1998, 2000) for interesting findings regarding the interaction between stress and pitch. In his discussion, he defines many of the complex issues and problems for further research.

3.3.2 Foot Form Trochaic

Sliammon has left-headed (trochaic) feet as shown by the data in (110.a-g). The ungrammatical forms in (110.a'-g') confirm that feet are not right-headed (iambic).

(110) Left-dominant, Trochaic Feet

	Input		Output	Gloss
a.	čiya	čiya	číyɛ ~ číya	*grandmother, granny*
a'.			*čiyɛ́ ~ *čiyá	
b.	k̓ʷut̓a	k̓ʷut̓a	k̓ʷót̓a ~ k̓ʷút̓a	*barbecuing stick*
b'.			*k̓ʷot̓á ~ *k̓ʷut̓á	
c.	wik̓al̓i	wik̓al̓i	wík̓ɛʔlɛ ~ wík̓aʔlɛ	*hermit crab*
c'.			*wik̓ɛ́ʔlɛ ~ *wik̓áʔlɛ	

d. mnat'ᶿi	m[ə]nat'ᶿi	mə́nat'ᶿɛ	*drum*
d'.		*mənát'ᶿɛ	
e. IMP-č̓ag-t-as	č̓a-č̓ag[a]tas	č̓ɛ́č̓ɛgàtʌs	*s/he is helping her*
e'.		*č̓ɛč̓ɛ́gatʌ̀s	
f. yaɬ-t-anapi-m-'uɬ	yaɬ[a]tanapimuɬ	yɛ́ɬatànapèmʊɬ	*you (pl) got called*
f'.		*yɛɬátanàpemòɬ	
g. x̌ʷup=inas=tn	x̌ʷupinastn	x̌ʷópenàstn̩	*brooch*
g'.		*x̌ʷopénʌstə̀n	

In sentential contexts, mono-syllabic content (lexical) words are also stressed, as shown by the examples in (111). The grammatical markers (particles and clitics), on the other hand, are typically unstressed and phonologically dependent (cf. Appendix VII on affixes and clitics).

(111) Sentential Contexts

Input		Output	Gloss
a. ƛ̓in̓a a kʷ θ naʔ	naʔ	ƛ̓ɛ́ʔna[h]ʌ kʷəθ nə́ʔ	*Do you have oolichan oil?*
a'. naʔ	naʔ	nə́ʔ	*belong to*
b. ʔwk̓ʷ št ʔut ʔj̓	ʔy̓	ʔúk̓ʷšt ʔotʰ ʔíʔ	*We're all fine*
b'. ʔj̓	ʔy̓	ʔíʔ	*good*
c. pq tə ʔayaʔ	pəq	pʌ́qʰ tə ʔáy̓ɛʔ	*the house is white*
c'. pq	pəq	pʌ́q	*white*
d. hu ga šʔ	šəʔ	hó gʌ šɛ́ʔ	*go upstairs!*
d'. šʔ	šəʔ	šɛ́ʔ	*go upwards*

Since mono-syllabic lexical items are stressed in sentencial contexts, they are also marked with primary stress in isolation, as in (112).

(112)

	Input	Output	Gloss
a.	t̓in	t̓ɛ́n	*barbecued salmon*
b.	ɬixʷ	ɬíxʷ	*lose a loved one*
c.	p̓ix̌ʷ	p̓ɛ́x̌ʷ	*flood*
d.	wuk̓ʷ	wúk̓ʷ	*scoop net*
e.	ɬuk̓ʷ	ɬúk̓ʷ	*to fly*
f.	ƛ̓uqʷ	ƛ̓óqʷ	*hard*
g.	ɬuq̓ʷ	ɬóq̓ʷ	*clear skies*
h.	k̓ʷas	k̓ʷás	*hot*
i.	k̓ʷač̓	k̓ʷáč̓	*dogfish*
j.	ʔaxʷ	ʔáxʷ	*falling snow*
k.	č̓ɬ	č̓íɬ	*rain*
l.	pq	pʌ́q	*white*
m.	p̓θk	p̓ə́θk	*bullhead* (fish)
n.	t̓ᶿmš	t̓ᶿʌ́mš	*soaked*
o.	t̓kʷs	t̓ə́kʷs	*to burst*
p.	mθkʷ	mə́θkʷ	*blackcap berry*

3.3.3 Stressed Schwa

Many Salish languages avoid stressing schwa if there is a full vowel in the syllable to its right (cf. Thompson and Thompson (1992), Czaykowska-Higgins and Kinkade (1997:15-16) and the references cited therein, Bianco (1995, 1996), Shaw et. al. (1999), amongst others). Stress in Sliammon is always leftmost even if it means stressing schwa rather than an adjacent full vowel, as shown by the data in (113) (cf. Blake 1992, 1995, and Urbanczyk 1999).

(113)

	Input	Schwa epenthesis	Output	Gloss
a.	qy̓a	q[ə]ʔya	qáʔyɛ	*water*
b.	q̓g̓a	q̓[ə]ʔga	q̓áʔga ~ q̓áʔgʌ	*cane, walking stick*
c.	mn̓a	m[ə]ʔna	máʔna	*child, offspring*
a.	tkʷɬi	t[ə]kʷɬi	tʊ́kʷɬe	*rabbit*

3.3.4 Location of Secondary Stresses

Now consider longer words which have more than a single degree of stress. The primary stress is located at the left-hand edge of the word, as shown by the data in (114). Secondary stress is marked by the grave accent [v̀]. The syllable which bears primary stress tends to be higher in pitch, as indicated in Column 4 (H=high, M=mid, L=low pitch).

(114) Primary and Secondary Stresses

	Input		Output	[pitch]	Gloss
a.	qms-t-'uɬ č	qə́m . sa . tùɬ . čʰ	qʌ́msatòɬčʰ	[HLM]	*I stored it away*
b.	IMP-t̓ᶿuk̓ʷ-INC	t̓ᶿú . t̓ᶿu . k̓ʷùk̓ʷ .	t̓ᶿót̓ᶿok̓ʷùk̓ʷ	[HLM]	*breaking daylight*
c.	DIM-x̣̌atx̌+[i]	x̣̌á-x̣̌at[i]x̌	x̣̌áx̣̌atɛ̀x̌ ~ x̣̌áx̣̌ətɛ̀x̌	[HLM]	*grasshopper*
d.	DIM-x̣̌ʔɬum=uɬ	x̣̌í-x̣̌əʔɬùmuɬ	x̣̌ɪ́x̣̌aʔɬòmʊɬ	[HLML]	*wolf cub*
e.	ɬn̓-t-'uɬ a čxʷ	ɬə́n̓tuɬàčxʷ	ɬʌ́n̓toɬæ̀čw̥	[HLML]	*Did you weave it?*

Some forms are recorded with adjacent stressed syllables, as shown by the data in (115).

(115)

a.	laplaš	laplaš	láplàš	*plank, long board*
b.	kamputs	kamputs	kǽmpùts	*rubber boots*

The stative forms in (116.a-e) also have adjacent stresses, and are accompanied by [HH] pitch pattern, as documented by Watanabe (2000).

(116) Stative /-it$_{\mu\mu}$/

	Input		Output	[pitch]	Gloss
a.	qʷač̓-it	qʷač̓it	qʷá:č̓itʰ	[HH]	*burping, belch*
a'.	qʷač̓-it č	qʷač̓i<t>č	qʷá:č̓ič	[HH]	*I'm burping*
a".	IMP-qʷač̓ č	qʷa-qʷač̓ č	qʷáqʷač̓čʰ		*I'm burping*
b.	qʷiq̓ʷ-ʔm+[i]	qʷiq̓ʷʔim	qʷéq̓ʷʔɛ̀m	[HH]	*s.b. is nailing*
c.	ƛ̓ux̌ʷ-it	ƛ̓ux̌ʷit	ƛ̓ó:x̌ʷɛ̀tʰ	[HH]	*crying*
c'.	IMP-ƛ̓ux̌ʷ-it-'uɬ št	ƛ̓u-ƛ̓ux̌ʷituɬ št	ƛ̓óƛ̓. x̌ʷɛ.tòɬ . št		*we were all crying*
d.	tap-it	tap-it	tá:pɛ̀tʰ	[HH]	*tight*
d'.	IMP-tap-INC	ta-tap-ap	tátapʌpʰ		*getting tighter*
e.	gan-[i]m	ganim	gá:nɛ̀m	[HH]	*orphan*
e'.	IMP-gan-[i]m+[ʔ]	ga-gan-im̓	gágʌnɛm̓		*having no parents*

3.3.5 LSs and Stress Assignment

One area which has not been discussed in any detail elsewhere, but warrents mention here is the role which Lexical Suffixes play in stress assignment in Sliammon. Bi-syllabic Lexical Suffixes tend to be stressed in Sliammon, as shown by the data in (117). From a historical/comparative perspective, Lexical Suffixes in Salish languages may originate from independent Roots with the loss of the initial consonant, following Egesdal (1981), Mattina (1987), and Kinkade (1998). Blake (2000) argues that LSs in Sliammon behave like bound Roots with respect to the resolution of vowel hiatus in the language. It is proposed here that the root-like status of Lexical Suffixes in Sliammon may also explain the observed stress properties[1].

(117) LSs and stress assignment

	Input	Output	Gloss
a.	t̓ᶿiyč̓=aǧ̓ič	t̓ᶿíyč̓àʔgičʰ	*twisted spine* (t̓ᶿiyč̓ *twisted*, =aǧ̓ič *spine*)
b.	x̌awšin=aǧ̓ič	x̌áwšinàʔᵊgɩč	*spine* (x̌awšin *bone*)
c.	ƛ̓pxʷ=aǧ̓ič	ƛ̓ʌ́pxʷàʔgɩč	*break one's back* (ƛ̓pxʷ *break*)
d.	IMP-qʷay=ax̌iθ	qʷáqʷayʎx̌ɛθ	*talking in one's sleep* (=ax̌iθ *bed*)
e.	ʔusa=aǰ̓a	ʔósahàʔǰɛ	*blueberry leaves* (ʔusa *blueberry*)
f.	q̓nayu=aya	q̓ʌ́nayohàyɛ	*sewing needle case* (q̓ənayu *sewing needle*)
g.	p̓q̓=aya	p̓áʔq̓àyɛ	*stove pipe* (p̓əq̓ *smoke*, =aya *container*)
h.	ngin=aya	nɩ́ginàyɛ	*lunch basket* (nəgin *lunch*)

The LSs =uɬ *young of a species* usually bears secondary stress, as shown by the data in (118).

(118)

	Input		Output	Gloss
a.	q̓aykʷ	q̓aykʷ	q̓ʌ́ykʷʰ	*bald eagle*
a'.	DIM-q̓aykʷ=uɬ+[ʔ]	q̓a-q̓aykʷuɬ	q̓áq̓ʌykʷùɬ	*small eagle*
b.	kʷum̓t	kʷum̓t	kʷúm̓t	*kelp*
b'.	DIM-kʷum̓t-uɬ+[ʔ]	kʷu-kʷumtuɬ	kʷúkʷumtʊ̀ɬ	*small kelp*
c.	ɬaǧ̓at̓	ɬaʔgat̓	ɬáʔgət̓ ~ ɬáʔgʌt̓	*herring*
c'.	DIM-ɬaǧ̓at̓=uɬ+[ʔ]	ɬa-ɬgat̓uɬ	ɬáɬgat̓ɔ̀ɬ	*small herring*
d.	ǰanxʷ	ǰanxʷ	ǰɛ́nxʷ	*fish (generic)*
d'.	DIM-ǰanxʷ[-i-]=uɬ+[ʔ]	ǰa-ǰnixʷuɬ	ǰɛ́ǰᵊnexʷùɬ	*small fish*

---

[1]Kinkade (1973), Czaykowska-Higgins (1996, 1998), Shaw et al. (1999), Tamburri Watt (1999, 2000) discuss LSs and stress assignment in a number of other Salish languages.

e.	x̌ʷax̌ʷniʔ	x̌ʷax̌ʷniʔ	x̌ʷáx̌ʷᵊnɛʔ	*bullhead*
e'.	x̌ʷax̌ʷniʔ=uɬ	x̌ʷax̌ʷniʔuɬ	x̌ʷáx̌ʷᵊneʔòɬ	*small bullhead*
f.	ƛ̓y̓m	ƛ̓y̓əm	ƛ̓íʔəm	*cockle*
f'.	DIM-ƛ̓y̓m[-i-]-uɬ	ƛ̓a-ƛ̓y̓imuɬ	ƛ̓áƛ̓iʔemòɬ	*small cockle*
g.	t̓ᶿumaǰ̓u	t̓ᶿumaʔǰu	t̓ᶿómaʔǰʊ	*barnacle*
g'.	DIM-t̓ᶿumaǰ̓u=uɬ	t̓ᶿu-t̓ᶿmaǰuʔuɬ	t̓ᶿót̓ᶿᵊmaǰuʔòɬ	*small barnacle*
h.	sm̓a	səʔma	sáʔma	*blue mussel*
h'.	DIM-sm̓a=uɬ+[ʔ]	si-sm̓aʔuɬ	sísm̓aʔòɬ	*small blue mussel*
i.	p̓ux̌ʷu	p̓ux̌ʷu	p̓óx̌ʷo	*raven*
i'.	DIM-p̓ux̌u=uɬ+[ʔ]	p̓i-p̓x̌ʷuʔuɬ	p̓ép̓x̌ʷoʔʊ̀ɬ	*small raven*

Other LSs, such as =inas, do not bear secondary stress if it creates a stress clash, as shown by the comparison between the data in (119-120).

(119) =inas chest

	Input		**Output**	**Gloss**
a.	ntx̌-[ɪ]m=inas	nətx̌im=inʌs	nʌ́t . x̌e . mè . nʌs .	*heart beat*
b.	IMP-ǰk̓ʷ-m=inas	ǰə-ǰk̓ʷ-[a]m=inʌs	ǰéy . k̓ʷa . mè . nʌs.	*heart burn*
b'.	IMP-ǰk̓ʷ	ǰə-ǰk̓ʷ	ǰɛ́yk̓ʷ	*rubbing*

(120) =inas *chest*

	Input		**Output**	**Gloss**
a.	qʷup=inas	qʷup=inʌs	qʷó . pe . nʌs.	*hair on chest*
b.	x̌at̓ᶿ=inas	x̌at̓ᶿ=inʌs	x̌á . t̓ᶿe . nʌs .	*breast bone, sternum*
c.	ƛ̓kʷ=inas	ƛ̓əkʷ=inʌs	ƛ̓ʊ́ . kʷi . nʌs .	*heart*

Although primary stress is most often leftmost as discussed above, it is a point which requires further investigation; exceptions to the generalization that primary stress is leftmost involves words which contain Lexical Suffixes. I have recorded some examples in which primary stress is right-most rather than left-most, as shown by the data in (121). Notice that these examples have a [MLHL] pitch pattern; primary stress is correlated with the syllable which bears the highest pitch.

(121)

	Input		Output	[pitch]	Gloss
a.	q̓ʷuw=an̓a	q̓ʷuw=aʔana	q̓ʷòwaʔána	[MLHL]	*ear*
b.	DIM-qʷup=an̓a	qʷu-qʷp=aʔana	qʷòqʷpaʔána	[MLHL]	*hair sticking out ears*
c.	x̌ʷaw̓=iqʷ=uǰ̓a	x̌ʷaʔw=iqʷ=uʔǰa	x̌ʷàʔwɛqʷóʔǰɛ	[MLHL]	*finger*
d.	ƛ̓ax̌=iqʷ=uǰ̓a	ƛ̓ax̌=iqʷ=uʔǰa	ƛ̓àx̌eqʷóʔǰɛ	[MLHL]	*thumb*
e.	kit̓=iqʷ=uǰ̓a	kit̓=iqʷ=uʔǰa	kʸɛ̀t̓eqʷóʔǰɛ	[MLHL]	*pinky, little finger*

These examples all involve Lexical Suffixes, as indicated by the equals sign (=) which precedes the LS (cf. also Appendix VI). The examples in (121.c-e) contain two adjacent LSs. The surface stress patterns resemble the same stress patterns associated with compounds in the language, as shown by the single example in (122). Compounds are rare in Sliammon, as discussed by Hagège (1976), and Watanabe (2000).

(122)

a.	pq-aɬ-čayiš	pəqaɬčayiš	pʌ̀q:ʌɬčéyɩš	*palm (white of hand)*
a'.	pq	pəq	pʌ́q	*white*
a".	čayiš	čayiš	čɛ́yɩš	*hand*

For our present purposes, I will continue to assume that primary stress is left-most but acknowledge that a complete analysis of Sliammon metrical structure is still wanting, and there are many questions which remain for future research. In particular, although the locus of primary stress is fairly well established, the generalizations regarding secondary stress placement are not well understood.

3.4 Summary

This chapter provides discussion and independent motivation for the prosodic structures which are assumed in the remainder of the thesis. As argued in §3.2, the distribution of schwa is often determined by the requirement that each Foot contains a vocalic nucleus, and is not driven solely by constraints on syllabification, since Sliammon has vowelless syllables in word-final position.

Chapter 4

Distribution of Schwa in Sliammon

Raven has blue eyes, like the waters of
[Harwood Island] on a good day.
He also carries a black magic umbrella.
This makes me want to sing. Caw caw.
Or cry.

Phyllis Webb

4.0 Introduction

In this chapter, I argue that there are three different schwas in Sliammon, as evidenced by their phonological behaviour: (i) Excrescent (or transitional) schwa, which is written as a small raised schwa [ᵊ] to differentiate it from all other schwas, which are written as [ə], (ii) Epenthetic schwa (E-schwa), which displays ə ~ Ø alternations, and (iii) Non-alternating schwa (S-schwa) which does not show any surface alternation, and is subsumed under (ii). The terms E-schwa, and S-schwa are descriptive, pre-theoretical terms used here following van Oostendorp (1999) in order to underscore "the various roles which schwa can play in the phonology of a language". Van Oostendorp (1999) also includes the term R-schwa to refer to schwas which shows full vowel/schwa alternations. It will be argued in §3.3 that Full Vowel Reduction in Sliammon is distinct from reduction to schwa. Although the resultant reduced full vowel shares the same prosodic representation as schwa (i.e the reduced full vowel is proposed to be Nuclear and non-moraic), it retains its distinctive feature specification. The traditional designation "Reduced Vowel" is maintained in order to emphasize the fact that it does not neutralize with schwa.

4.1 Excrescent versus Epenthetic Schwa

In terms of accounting for the distribution of schwa in Sliammon, it is necessary to distinguish 'epenthetic' schwa from 'excrescent' schwa, following work by other Salishan scholars, such as Bagemihl (1991), Bessell (1992), Matthewson (1994), and Kinkade (1997). In the section which follows, I will outline the phonological distribution and surface alternations which do provide evidence for the distinction between epenthetic schwa on the one hand, and excrescent schwa on the other hand.

4.1.1 The Problem

In Sliammon, some schwas surface consistently in each token of a given word. This holds of different instances of the same word from the same speaker as well as across speakers, as in (1-2).

(1) **Same Speaker**

Input	**Schwa [ə]**	**Output: Multiple tokens**	**Gloss**
a. ɬx̌	ɬ[ə]x̌	ɬʌ́x̌	*bad*
b. č̓ɬ	č̓[ə]ɬ	č̓ɩ́ɬ	*rain*
c. mƛ̓	m[ə]ƛ̓	mʌ́ƛ̓	*calm (on water)*
d. q̓y̓a	q̓[ə]ʔya	q̓áʔyɛ	*water*
e. q^{w}asm	q^{w}as[ə]m	q^{w}ásəm	*flower*
f. pq=uk^{w}t+[i]	p[ə]quk^w[i]t	pʌ́q^{w}ok^{w}it^h	*dressed in white*

(2) **Different Speakers**

Input	**Schwa [ə]**	**Output: Multiple speakers**	**Gloss**
a. p̓q̓	p̓[ə]q̓	p̓ʌ́q̓	*smoke*
b. pq	p[ə]q	pʌ́q	*white*
c. sx̌m	s[ə]x̌[ə]m	sʌ́x̌ʌm	*racing canoe*
d. q^{w}l̓	q^w[ə]l̓	q^{w}ʌ́l̓	*they came*
e. mθk^w	m[ə]θk^w	mə́θk^w	*blackcap berry*
f. ngin	n[ə]gin	nɩ́gin ~ nɩ́gɩn	*packed lunch*

Contrast this with the data in (3-4). In these examples the schwa [ᵊ] is very brief and more variable in its surface realization. For example, a speaker may pronounce a very brief schwa in one token of a given word whereas in other instances this brief transitional vowel is not recorded, as in (3).

(3) **Same Speaker**

Input	**Output 1**	**Output 2**	**Gloss**
a. x̌ʷil̓-m	x̌ʷɛ́ʔləm	x̌ʷɛ́ʔᵊləm	*rope*
b. yag̓ay	yɛ́ʔgʌy	yɛ́ʔᵊgʌy	*inner cedar bark*
c. paL' qʷum̓ay	páʔa qʷóʔmʌy	páʔa qʷóʔᵊmʌy	*one year (one snow)*
d. θam=šaʔ	θʌ́mšɛʔ	θʌ́mšɛʔᵊ	*twenty*

The output forms in (4) Columns 3-4 show that the presence of this brief schwa [ᵊ] also varies across speakers.

(4) **Different Speakers**

Input		**Speaker 1**	**Speaker 2**	**Gloss**
a. tm̓=us=tn	təʔmustən	táʔmostən	táʔᵊmostən	*headband*
b. q̓snaǰ̓	q̓əsnay̓	q̓ʌ́snʌy̓	q̓ʌ́sᵊnʌy̓	*shirt, dress*
c. ʔatnupil	ʔatnupil	ʔátnopɛ̀l	ʔátᵊnopɛ̀l	*auto, car*
d. lkli	ləkli	lɪ́klɛ	lɪ́kᵊlɛ	*key*
e. ǰaǰ̓a	ǰaʔǰa	ǰɛ́ʔǰɛ	ǰɛ́ʔᵊǰɛ	*relative, friend*
f. L'-x̌i-x̌niq̓	x̌[iʔ]i-x̌niq̓	x̌ɛ́ʔɛx̌nɛq̓	x̌ɛ́ʔɛx̌ᵊnɛq̓	*Owl's Grove*

These variable transitional schwas are ***very*** brief in duration, audibly shorter than the instances of schwa which surface consistently. The transitional schwas are inserted either after a glottal, as in (3) or between consonants when the second consonant is a resonant, as in (4).

4.1.2 Evidence from Syllabification

There are some schwas which are syllabified as separate syllable peaks, and other schwas which are not. This contrast is shown by the data in the syllabification columns of (5-6). Recall from §2.4.2.2.1 and §2.4.4, that schwa lacks inherent features, and as such is subject to colouration from adjacent consonants which accounts for the range of surface outputs in (5) Column 3 and (6) Column 2.

In the data in (5), the stressed initial schwa [ə́] functions as a syllable peak. The syllabification of each form is given in Column 4.

(5) Schwa functions as a syllable peak

Input		**Output**	**Syllabification**	**Gloss**
a. np=šn	nə́pšən	nə́pšɩn	nə́p . šən	*tripped*
b. t̓lk̓[-i-]	t̓ə́lik̓	t̓ə́lɩk̓	t̓ə́l . lik̓	*a hole*
c. č̓t-t-as	č̓ə́ttas	č̓ə́tᵊtas ~ č̓ə́tᵊtʌs	č̓ə́t . tas	*he cut it*
d. IMP-tk̓ʷ-t-as	tə́tk̓ʷətas	tə́tk̓ʷətʌs	tə́t . k̓ʷə . tas .	*he's pulling it*

Contrast this with the syllable judgements in the next set of data. The data in (6.a-b) shows presence of a brief schwa [ᵊ] in the environment before a word-initial resonant. In (6.c-e) a brief schwa [ᵊ] occurs either before or after a resonant when it is adjacent to a voiceless obstruent. In (6.f) it occurs between two identical stops. A comparison of the syllabification of forms in (6) Columns 3-4 shows that these instances of schwa are not considered separate syllable peaks by Sliammon consultants, in contrast to the data in (5) above (cf. §3.2 for constraints on syllabification). [h] is the least-marked epenthetic consonant in the language, and is inserted here to show that the ungrammatical examples in Column 4 are not ruled out independently by the Onset constraint.

(6) Brief schwa ≠ Syllable peak

Input	**Output**	**Syllabification**	***Syll Peak**	**Gloss**
a. yp̓-t	[yə́p̓t ~ ᵊyə́p̓t]	yə́p̓t	*[h]ᵊ . yə́p̓t	*break it*
b. yč̓+[i]	[yíč̓ ~ ᵊyíč̓]	yíč̓	*[h]ᵊ . yič̓	*full*
c. mƛ̓-mut	[mə́ƛ̓ᵊmòt]	mə́ƛ̓ . mùt	*mə́ . ƛ̓ᵊ . mùt	*very calm*
d. IMP-x̌ał-mut	[x̌áx̌ałᵊmòt]	x̌á . x̌ał . mùt	*x̌á . x̌a . łᵊ. mùt	*he's really tall*
e. qayx̌	[qáyᵊx̌]	qáy . x̌	*qá . yᵊx̌	*Mink*
f. č̓t-t-as	[č̓ə́tᵊtas]	č̓ə́t . tas	*č̓ə́ . tᵊ . tas	*he cut it*

It seems worthwhile to note that these brief schwas [ᵊ] in (6.c-e) occur between an obstruent and following resonant or vice versa, and provide a transition between consonants with different major class features. Recall from §2.3.2 that obstruents are unmarked for the feature [sonorant] whereas resonants are lexically specified as [sonorant].

Contrast this with what happens in (7). Here a brief schwa [ᵊ] occurs between a front (i.e.[-bk]) vowel [i ~ e ~ ɛ] and a following post-velar consonant. (Note: the symbol [ɫ] represents a backed/retracted variant of /l/, and not a voiceless lateral fricative.) In this case, the brief schwa [ᵊ] provides a transition between a vowel and a following consonant produced at opposite places of articulation; for example, between the [-bk] vowel and a uvular stop, as in (7.a-b). When the tongue moves from the anterior portion (front) of the oral cavity towards the uvula, it moves through a neutral position. This brief neutral transition is perceived as a transitional schwa. These are cases of diphthongization and will not be discussed further here.

(7)

Input		**Output**	**Gloss**
a. RED-qʷay+[ʔ]	qʷi-qʷay̓	qʷéᵊqʷay̓	*talking*
b. p̓iqin	p̓iqin	p̓íᵊqɛn	*shoulder blades*
c. č̓q̓	č̓əq̓	č̓ɛ́ᵊq̓	*fence*
d. čalas	čálas	čɛ́ᵊɫʌs	*three*

So what we have observed in this section is that [ə] and [ᵊ] are syllabified differently; [ə] functions as a syllable peak whereas [ᵊ] is ignored for purposes of syllabification. The next section characterizes this observed difference in terms of epenthetic versus excrescent schwa.

4.1.3 Discussion and Proposed Analysis

In his paper on syllable structure in Bella Coola, Bagemihl (1991: 600) discusses the characteristics of excrescent vowels, following work by Levin (1987)[1]. These generalizations are presented in (8) below and are cited from Bagemihl (1991):

(8) **Excrescent vowels**

a. The *quality* of an excrescent vowel is variable, frequently tends towards schwa, and is generally determined by phonetic coarticulation effects. The surface quality of an excrescent vowel does not necessarily correspond to any of the underlying vowel qualities of the language.

b. The insertion of an excrescent schwa is triggered by the need for *a transition between adjacent articulations*, and is *not* inserted in order to syllabify stray consonants. Phonological rules do not refer to an excrescent schwa.

The central claim to be made in this section is that these brief transitional [ᵊ] schwas in Sliammon show the same cluster of properties attributed to excrescent vowels in (8.a-b) above. Given the present analysis of the phonology and morphology of the language, there is no evidence that these excrescent vowels are referred to by phonological constraints within the grammar. I conclude that these brief transitional schwas are phonologically inactive, and therefore excrescent. I propose a sub-classification of two types of excrescent vowels, the second constituting what are commonly referred to as "echo vowels".[2]

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[1]Matthewson (1994), Bianco (1996), and Kinkade (1997) present similar argumentation, citing Bagemihl's (1991) research on syllable structure in Bella Coola.

[2]I use the term "echo vowel" to refer to the brief vowel often heard after laryngeal closure (cf. Bessell 1992). This is distinct from the "linking" vowel in Sliammon associated with Control Transitive Allomorphy (cf. J.Davis 1970 et seq., Kroeber 1989, Blake 1999, Watanabe 2000).

4.1.4 Further Differentiation: Echo Vowels

There is often an echo vowel, represented here as a raised excrescent vowel [ᵋ, ᵃ], after a syllable final glottal, as shown by the data in (9) Column 3. It is typically a copy of the preceding vowel.

(9) **Echo Vowels**

Input		**Output**	**Syllabification**	***Syllable peak**	**Gloss**
a. ʔiľ-it	ʔiʔlit	ʔέʔᵋlεt	ʔέʔ . lεt	*ʔέ . ʔᵋ . lεt	*shallow*
b. qaẃum	qaʔwum	qáʔᵃwʊm	qáʔ . wʊm	*qá . ʔᵃ . wʊm	*eye*
c. tľč+[i]	təʔl[i]č	táʔᵃlɩč	táʔ . lɩč	*tá . ʔᵃ . lɩč	*round*
d. q̓ẃut̓ᶿ	q̓əʔwut̓ᶿ	q̓áʔᵃwut̓ᶿ	q̓áʔ . wut̓ᶿ	*q̓á . ʔᵃ . wut̓ᶿ	*uvula*
e. qʷľ	qʷə́lʔ	qʷə́lʔᵊ	qʷə́ľ	*qʷə́l . ʔᵊ	*come*

Echo vowels, like excrescent schwas, are not considered separate syllable peaks by Sliammon consultants, as shown by the contrast between the data in (9) Columns 4-5. Echo vowels may represent a broken vowel in which the glottal constriction (laryngealization), written as [ʔ], represents the most prominent glottal pulse during the articulation of a creaky vowel. The glottal constriction may be articulated with the supra-laryngeal tract in the vowel configuration, a configuration which may continue slightly after laryngealization has ceased (or the glottal stop has been released), producing an echo vowel: vʔᵛ (cf. Bessell (1992:6) for similar argumentation for Nɬakapmxcin (Thompson Salish), and Chomsky and Halle (1968: 315-316) for a discussion of glottal constriction).

Since excrescent vowels and echo vowels are not referred to by phonological constraints nor do they figure into the prosodic structure of the language (i.e. they do not function as syllable nuclei), they are not discussed further in subsequent chapters. It is worth emphasizing that anyone working on the language for the first time will need to make the distinction between excrescent schwa versus other instances of schwa.

(10)

[ᵊ] excrescent schwa

[ə] schwa

The next section presents the distribution and analysis of epenthetic schwa (E-schwa) which shows schwa ~ zero alternations.

4.2 Distribution of E-schwa

4.2.1 Some schwas are epenthetic

Diminutive CV- reduplication is accompanied by deletion of the Root vowel, as discussed by Kroeber (1989), Blake (1992), Watanabe (1994), and illustrated by the data in (11). The reduplicant is a CV- prefix (a monomoraic open syllable) and in these examples is immediately followed by the Root. The Root vowel does not surface in the diminutive, as shown by (11.a'-d') Columns 3 and 4. The use of the angled brackets < > in Column 3 shows which vowel is deleted.

(11) Deletion of the Root vowel in Diminutive

	Input	Red+Base	V-deletion	Output	Gloss
a.	x̌ʷil̓m		x̌ʷíl̓əm	x̌ʷɛ́ʔlʌm	*rope*
a'.	DIM-x̌ʷil̓m+[i]+[ʔ]	DIM-(x̌ʷíl̓im̓)	x̌ʷí-x̌ʷ<i>lim̓	x̌ʷɛ́x̌ʷlɛm̓	*string, thread*
b.	x̌ʷus-m		x̌ʷúsəm	x̌ʷósʊm	*soapberry*
b'.	DIM-x̌ʷus-m+[i]+[ʔ]	DIM-(x̌ʷúsim̓)	x̌ʷú-x̌ʷ<u>sim̓	x̌ʷóx̌ʷsɩm̓	*small soapberry*
c.	yax̌ay		yáx̌ay	yʌ́x̌ʌy	*clam basket*
c'.	DIM-yax̌ay+[ʔ]	DIM-(yáx̌ay̓)	yá-y<a>x̌ay̓	yɛ́yx̌ʌy̓	*small basket*

The following diminutive and non-diminutive pairs in (12.1) and (12.2) show that some schwas are clearly epenthetic, an observation also made by Watanabe (2000). When the Root is followed by a consonant-initial suffix (e.g. =nač, or =šn) or is comprised of more than two consonants, then this gives rise to a string of word-internal consonants. An epenthetic schwa [ə] appears after the second consonant of the Root, as shown by the data in (12.1.a'-b') and (12.2.a'-c'), in order to provide a more optimal syllabification. The ungrammatical forms in (12.1a"-b") and (12.2a"-c") show that these forms do not satisfy the prosodic constraints on syllable and Foot as well as the outputs in (12.1a'-b') and (12.2a'-c') do. (cf. Chapter 3 and Chapter 7 (§7.6)).

(12.1) **Diminutive Reduplication**

	Input	Syncope	Output	Gloss
a.	q^{w}up=šn		q^{w}ópšɪn	*hair on legs*
a'.	DIM-q^{w}up=š[i]n+[ʔ]	q^{w}ú-q^w<u>pšin̓	q^{w}óq^{w}p[ə]šin̓	*bit of hair on legs*
a".			*q^{w}óq^{w}p . šin̓	
a"'.			*q^{w}óq^w[ə]pšin̓	
b.	ʔatnupil		ʔatnupil	*car, automobile*
b'.	DIM-ʔatnupil	ʔá-ʔ<a>tnupil	ʔá-ʔt[ə]nupɛl	*small car*
b".			*ʔá-ʔt . nopil	
b"'.			*ʔa-ʔ[ə]tnupil	

(12.2) **Diminutive Reduplication**

	Input		Output	Gloss
a.	θk^w=nač=tn	θ[ə]k^w=nač=tn	θúk^{w}načtən	*chair*
a'.	DIM-θk^w=nač=tn+[i]+[ʔ]	θi-θk^w[ə]načt[i]n̓	θíθk^w[ə]načtin̓	*small chair*
a".			*θíθk^w . nač . tin̓	
a"'.			*θíθ[ə]k^{w}načtin̓	
b.	tk^{w}ɬi	t[ə]k^{w}ɬi	túk^{w}ɬi	*rabbit*
b'.	DIM-tk^{w}ɬi	ti-tk^w[ə]ɬi	tí-tk^w[ə]ɬi	*small rabbit*
b".			*ti-tk^w . ɬi	
b"'.			*ti-t[ə]k^{w}ɬi	
c.	ƛq-m=aɬaɬ	ƛ[ə]q[ə]m=aɬaɬ	ƛʌ́qəmàɬæɬ	*mattress*
c'.	DIM-ƛq-m=aɬaɬ+[ʔ]	ƛi-ƛq[ə]ʔmaɬaɬ	ƛí-ƛq[a]ʔmàɬʌɬ	*small mattress*
c".			*ƛi-ƛq . m̓aɬaɬ	

c'''.		*ƛi-<u>ƛ[ə]q</u>m̓aɬaɬ

Comparison of the simplex forms with their corresponding diminutives shows that a vowel occurs between the first and second consonant of the Root, as in (12.1.a-b) whereas it appears after the second consonant of the Root in the corresponding diminutive (12.1.a'-b'). This may look like vowel metathesis and reduction. However, it is here hypothesized that the different syllabification results from syncope of the Root vowel and schwa epenthesis. The portion of the word which corresponds to the Root is underlined in Column 3.

If schwa is epenthetic in (12.1) and (12.2), then perhaps the distribution of schwa is predictable in all contexts in which it occurs. This means that the distribution and surface realization of schwa should follow from its phonological representation and the interaction of the constraints on prosodic representations.

There have been a number of recent proposals for other Salish languages which suggest that schwa is not present in the underlying/Input representation and that its distribution is entirely predictable (cf. Matthewson (1994), Roberts and Shaw (1995), Kinkade (1997), Shaw (1996.b)). This is the position which is adopted here as well. The task therefore becomes showing that the contexts in which schwa does occur can be determined by constraints within the grammar.

4.2.1.1 Related Theoretical Issues

Before continuing with the discussion of epenthetic schwa, note that there is some data which presents an opportunity to explore related issues of theoretical interest. The data in (13) shows surface [ʌ] which occurs between a Root and a following Lexical Suffix (=LS).

(13) Epenthetic [ʌ]

	Input	Output	Gloss
a.	pɬq̓=šin (stv)	pə́ɬq̓[ʌ]š̃in	*to slip (foot slips)*
a'.	pɬq̓=šin-'uɬ a čx^w	pə́ɬq̓[ʌ]šὲʔnoɬæ̀čx^w	*Did you slip?*
b.	č̓lq̓=šin-m	č̓ílq̓[ʌ]š̃inəm	*cross one's legs*

The question which arises is does [ʌ] come from epenthetic [ə] (i.e. a bare NUC), as in (14) or an epenthetic full vowel [V] (NUCμ), as in (15)? Recall from §2.4.2.2.1 that the full vowels are Nuclear and moraic whereas schwa is characterized as a bare Nucleus, in keeping with the Nuclear Moraic Model.

(14)

	Input	[NUC]	Output	Gloss
a.	pɬq̓=šin (stv)	(pə́ɬ$_\mu$. q̓[ə]) (s̃in)	pə́ɬq̓[ʌ]s̃in	*to slip (foot slips)*
a'.	pɬq̓=šin-'uɬ a čx^w	(pə́ɬ$_\mu$. q̓[ə]) (s̃iʔnu)(ɬàčx^w)	pə́ɬq̓[ʌ]šɛ̃ʔnoɬæ̀čx^w	*Did you slip?*
b.	č̓lq̓=šin-m	(č̓ə́l$_\mu$. q̓[ə]) (s̃inəm)	č̓ɩ́lq̓[ʌ]s̃inəm	*cross one's legs*

(15)

	Input	[NUCμ]	Output	Gloss
a.	pɬq̓=šin (stv)	(pə́ɬ$_\mu$ .q̓[V]$_\mu$) (s̃in)	pə́ɬq̓[ʌ]s̃in	*to slip (foot slips)*
a'.	pɬq̓=šin-'uɬ a čx^w	(pə́ɬ$_\mu$ .q̓[V]$_\mu$) (s̃iʔnu)(ɬàčx^w)	pə́ɬq̓[ʌ]šɛ̃ʔnoɬæ̀čx^w	*Did you slip?*
b.	č̓lq̓=šin-m	(č̓ə́l$_\mu$. q̓[V]$_\mu$) (s̃inəm)	č̓ɩ́lq̓[ʌ]s̃inəm	*cross one's legs*

The reason it is difficult to tell is that [ʌ] occurs in unstressed post-tonic position, a position which is particularly susceptible to full vowel reduction (/a/ to [ʌ]). Note however that [ʌ] also arises from height assimilation and is conceivably a variant of either epenthetic schwa (a bare [NUC]) or an epenthetic full vowel [V] in this phonological context (cf. §2).

Although we have been discussing schwa epenthesis (i.e. epenthesis of a bare NUC), the Foot structure in (14-15) Column 2, indicated by the parentheses ( ), suggests that surface [ʌ] is moraic, since Feet in the language are hypothesized to be minimally bimoraic. If [ə] is Nuclear but non-moraic, then the representations in (14) Column 2 will violate the constraint which ensures that Feet are minimally bimoraic (i.e. Foot Binarity), as shown by the initial mono-moraic Foot.

Epenthesizing a vowel which is both NUC and moraic therefore creates more optimal Foot structure, as shown by the structure of the left-most foot in each example in (15) Column 2.

In (12) above, epenthesis of a bare [NUC] is the minimal amount of structure needed in order to syllabify the word-internal stray consonants. Since Minimality requirements are met in (12), the insertion of prosodic structure is strictly minimal. Contrast this with (15) which requires the addition of extra prosodic structure (both a NUC and a mora) in order to syllabify the string of consonants, *and* provide a more optimal Foot structure which crucially meets the constraints on Minimality. This shows that schwa epenthesis occurs not only to create optimal syllables but also to create optimal Feet. This provides additional evidence for the generalization in §4.2.3 that schwa is epenthesized for purposes of stress assignment. Strengthening of schwa [NUC] to an epenthetic full vowel [NUCμ] is addressed in §4.4.

The data in (13-15) also raise the following interesting issues. If schwa is non-moraic and syllables can be bimoraic ($C\text{ə}C_{\mu}C_{\mu}$), then why is epenthesis necessary here at all? What prevents the ungrammatical forms in (16) Column 3?

(16)

	Input	Output	No epenthesis	Gloss
a.	pɬq̓=šin (stv)	pə́ɬq̓ʌš̀in	*pə́ɬq̓ . š̀in	*to slip (foot slips)*
a'.	pɬq̓=šin-'uɬ a čx^w	pə́ɬq̓ʌš̀ɛʔnoɬæ̀čx^w	*pə́ɬq̓ . š̀ɛʔnoɬæ̀čx^w	*Did you slip?*
b.	č̓lq̓=šin-m	*č̓ɩ́lq̓ʌš̀inəm	*č̓ɩ́lq̓ . š̀inəm	*cross one's legs*

Although the forms in (16) Column 3 may satisfy syllable structure constraints, notice that these candidates have adjacent stresses which constitutes a violation of *CLASH, a constraint which militates against adjacent heads of Feet. Vowel epenthesis therefore not only creates well formed syllables but it also creates optimal Foot structures, while avoiding a violation of *CLASH. The epenthetic [NUC] intervenes between adjacent heads: σ́ σ σ̀. This means that *CLASH is ranked above DEP[NUC], as shown by the partial constraint ranking in (17).

(17) pɬq̓=šin [pə́ɬq̓ʌš̓in] *to slip* (*foot slips* stv.)

pɬq̓=šin	*CLASH	DEP[NUC]
a. (pə́ɬ . q̓ə)(š̓in)		*
b. (pə́ɬq̓)(š̓in)	*!	

The other question which requires consideration is why does vowel epenthesis occur in the position in which it occurs. What prevents forms like those in (18) Column 3? The epenthetic vowel [ʌ] appears in square brackets.

(18)

	Input	Output	*Locus of [ʌ]	Gloss
a.	pɬq̓=šin (stv)	pə́ɬq̓[ʌ]š̓in	*pə́ . ɬ[ʌ]q̓ . š̓in	*to slip (foot slips)*
a'.	pɬq̓=šin-'uɬ a čxʷ	pə́ɬq̓[ʌ]šɛ̓ʔnoɬæ̀čxʷ	*pə́ . ɬ[ʌ]q̓ .šɛ̓ʔnoɬæ̀čxʷ	*Did you slip?*
b.	č̓lq̓=šin-m	č̓ə́lq̓[ʌ]š̓inəm	*č̓ə́ . l[ʌ]q̓ . š̓inəm	*cross one's legs*

It is proposed here that the ungrammatical forms in (18) Column 3 violate at least two constraints which are argued to be operative in the language. First, as will be argued in Chapter 5, there is a highly-ranked constraint which militates against schwa in a stressed open syllable (informally, $*\acute{ə}]_\sigma$) basically following Blake (1992), and Shaw (1995, 1996). Secondly, the epenthetic vowel [ʌ] has been epenthesized into a Root, violating Root Contiguity. Root O-Contiguity in Sliammon is proposed to rule out Root-internal epenthesis, and is a particular instantiation of the general O-Contiguity constraint of McCarthy and Prince (1995:371): "The constraint O-CONTIG rules out internal epenthesis: the map xz → xyz violates O-CONTIG, but xy → xyz does not." (cf. also LaMontagne 1996). The idea here is that epenthesis is more optimal at the edge of a morpheme, especially a Root, than it is in the middle of a morpheme. In contrast, the optimal forms in (18) Column 2 show that stressed schwa occurs in a closed syllable thereby satisfying $*\acute{ə}]_\sigma$, and that [ʌ] epenthesis has taken place at a morphological boundary (between the Root and following LS thus satisfying Root Contiguity (O-CONTIG ROOT)). The output forms in (18) Column 2 do not violate either of these constraints, as shown by the tableau in (19).

(19)

pɬq̓=šin	*ə́]σ	O-CONTIG ROOT
☞ a. [pə́ɬ . q̓]$_{Root}$ [ʌ] š̓in		
b. *[pə́ . ɬ[ʌ]q̓]$_{Root}$ š̓in	*!	*

This raises a related issue: if violations of Root Contiguity are avoided, then what about the initial epenthetic [ə́] schwa? Doesn't it also incur a Root contiguity violation? The answer is yes, but here Root Contiguity (O-CONTIG ROOT) is violated in order to satisfy the higher ranking constraints on Proper Headedness, and the Align Left Constraint which ensures that primary stress is aligned with the left-edge of the stem.

4.2.1.2 Language -internal Evidence for Schwa Epenthesis

Further to the cross-linguistic evidence from across the Salish language family for the non-phonemic status of schwa, this section provides three language-internal arguments which support the hypothesis that schwa is epenthetic in Sliammon. These arguments are based on the canonical shapes of Roots in the language.

First, there are no Roots which surface with an initial consonant cluster in the language, as illustrated by the unattested Output forms in (20). The reader is referred to Appendix V for a representative sample of Roots in Sliammon which provides verification of this generalization.

(20)

Output

a. *CCV....

b. *CCə....

Sliammon does have roots of the shape CACA (where A is a full vowel), as shown by the data in (21).

(21)

	Input	Output	Gloss
a.	čiya	číyɛ ~ čiya	*grandmother, grandma*
b.	ƛ̓in̓a	ƛ̓έʔna	*oolichan oil*
c.	kʷupa	kʷúpa	*grandfather, grampa*
d.	ʔusa	ʔósa	*blueberry*
e.	k̓ʷut̓a	k̓ʷút̓a	*barbecue stick*
f.	č̓an̓u	č̓έʔno	*dog*
g.	x̌akʷu	x̌ákʷu	*cow's parsnip*
h.	k̓ʷaxʷa	k̓ʷáxʷa	*box*

Sliammon also has Roots of the shape CəCA (i.e. where ə surfaces between the initial two consonants; under the hypothesis that schwa is epenthetic, these roots would be /CCA/), as shown by the data in (22).

(22) CəCA Roots

	Input		Output	Gloss
a.	x̌pi	x̌ə́pi	x̌ʌ́pi	*to turn back*
b.	pču	pə́ču	pɪ́ču	*basket*
c.	t̓ᶿx̌u	t̓ᶿə́x̌ʷu	t̓ᶿɔ́x̌ʷo	*ling cod*
d.	qy̓a	qəʔya	qáʔya ~ qáʔyɛ	*water*
e.	mn̓a	məʔna	máʔna	*child, offspring*
f.	sm̓a	səʔma	sáʔma	*mussel*

The absence of CC-initial roots on the surface is accounted for by the combined effects of the constraints *COMPLEX ONSET and DEP[NUC] (schwa epenthesis). Since complex onsets are generally banned in Sliammon, schwa epenthesis occurs in order to satisfy the higher-ranking constraint *COMPLEX ONSET.

Although there are CACA and CəCA Roots in Sliammon, there are no Roots attested of the form CəCə or CACə, i.e. where the ***second vowel*** is schwa:

(23) *CəCə , *CACə

If the distribution of schwa were idiosynchratic, akin to the distribution of the full vowels /i, u, a/ in the language, then we would expect to find the same patterns of distribution within the Root domain. Instead what we observe from the data in (21-22) versus (23) is that there is an asymmetry between the distribution of the full vowels in Roots and the distribution of schwa.

The analysis which is presented in this chapter not only predicts the occurrence of CəCA Roots but also the absence of *CəCə and *CACə Roots. The asymmetry between the existence of roots with schwa as the first vowel versus the absence of roots with schwa as the second vowel (*CəCə, *CACə) is explained as follows. Proper Headedness at the level of the Foot ensures that schwa is epenthesized after the first consonant (/CCA/ → Cə́CA) in order to provide a Nucleus as the head of the stress foot and also to satisfy *Complex Onset, whereas there is no motivation for the presence of the second schwa in the unattested Roots *CəCə and *CACə. Note that Foot Binarity is satisfied at the level of the mora since free-standing CAC Roots are bimoraic and independently footed in the language. If schwa were present in underlying representation and therefore claimed to have an unpredictable distribution, we would fail to have an explanation for the observed asymmetry in CVCV Root canons.

Another similar argument comes from the observed shapes of CVCC Roots in the language. Sliammon has a general constraint against CARR Roots in the language, indicating that there is a general constraint against adjacent resonants (*RR) in the language.

(24) *CARR

If we then consider the inventory of CVC Roots in the language, we observe another asymmetry. CAC Roots have the following canonical shapes where O=obstruent and R=resonant. Bound Roots are followed by a hyphen (i.e. CAC-) whereas free-standing Roots are not marked in this manner. CAC Roots exhibit the full range of logical possible combinations of Obstruents and Resonants in combination with the full vowels /i, u, a/, as shown by the data in (25).

(25) CAC Roots

	Attested Patterns	**Examples:**		
a.	OAO Roots	ƛ̓ip *under*	ƛ̓up *to heal*	ƛ̓ax̌- *old*
b.	OAR Roots	k̓ʷin *how many*	kʷum- *red, flushed*	tam *what*
c.	RAO Roots	yiq̓- *need (s.t.)*	wuk̓ʷ *scoop net*	nat *night*
d.	RAR Roots	niy- *forget*	wuw- *sing*	man *father*

Contrast this with the possible combinations of Obstruents and Resonants in combination with the vowel schwa. There are OəO, OəR and RəO Roots in the language, but RəR Roots are conspicuously absent, as shown in (26-27).

(26) CəC Roots

	Attested Patterns	**Examples**		
a.	OəO Roots	ƛ̓əp *deep, bottom*	ƛ̓əq *go outside*	pəq *white*
b.	OəR Roots	qʷəl̓ *to come*	qəy̓ *to die*	təm̓ *belt, tie*
c.	RəO Roots	məƛ̓ *calm on water*	nəp- *under, inside*	yəp̓ *to break (a cup)*

(27) *RəR

The gap in the attested CəC Root patterns is explained if schwa is epenthetic whereas the observed contrast does not have a well-motivated explanation if schwa were present in underlying representation.

These three arguments pertaining to permissable Roots canons in the language provide compelling internal evidence that schwa is epenthetic in Sliammon.

4.2.2 Schwa / Zero Alternations

There are many sets of morphologically related words in Sliammon which show schwa-zero alternations: ə ~ Ø . Consider the following Nouns and their corresponding diminutive forms which show that surface schwa alternates with zero: (ə ~ Ø). These data are presented under the hypothesis that schwa is not present in the Input (i.e. it is non-lexical) and that we can determine where it occurs.

Note that Weak Roots take Ci- as the diminutive reduplicative prefix rather than Cə-, as in (28.a'-f'). Diminutive is also marked by glottalization of the rightmost syllable-final resonant (with a number of complexities). Further, certain lexical items may also take the lexical suffix /=uɬ/ *young of a species*, in addition to the Ci- reduplicative prefix. Stems which end in a consonant cluster also take an [i] "infix" in the diminutive. The point which is of relevance here is the presence and absence of schwa between the first and second consonants of the Root. The simplex forms in (28.a-f) all have schwa between C_1 and C_2 of the Root, as shown by the forms in Column 2. The related diminutive forms in (28.a'-f') do not have a schwa in this position, as indicated by the space __ .

(28) **Epenthetic Schwa**

	Input	Schwa ~ Ø	Output	Gloss
a.	θy̓aɬ	θə́y̓aɬ	θáʔyɛɬ	*lake*
a'.	DIM-θy̓aɬ	θí-θ_yaɬ	θɩ́θyɛɬ	*small lake*
b.	k^{w}n̓ay	k^{w}ə́n̓ay	k^{w}áʔnʌy	*lid*
b'.	DIM-k^{w}n̓ay	k^{w}í-k^w_nay̓	k^{w}ík^{w}nʌy̓	*small lid*
c.	sm̓a	sə́m̓a	sáʔma	*mussel*
c'.	DIM-sm̓a=uɬ	sí-s_maʔuɬ	sɩ́smaʔòɬ	*small mussel*
d.	pskt	pə́skət	pə́skɩt	*biscuit, pilot bread*
d'.	DIM-pskt+[i]=uɬ	pí-p_skitùɬ	pɛ́psk^{y}i·tòɬ	*small biscuit*

e. sx̌m	sə́x̌əm	sʌ́x̌ʌm	*racing canoe*
e'. DIM-sx̌m+[i]	sí-s_x̌[i]m	sɛ́sx̌ɛm	*small racing canoe*
f. ms	mə́s	mʌ́s ~ mə́s	*mink*
f'. DIM-ms=uɬ+[ʔ]	mí-m̓_suɬ	mɛ́ʔᵋmsuɬ	*small mink*

The existence of schwa/zero alternations illustrated by the data in (28) raise the following questions: what determines the contexts in which schwa surfaces and those contexts in which is does not? Is the distribution of this vowel is predictable? Consider the distribution of schwa and Ø in (28). In (28.a-f) Column 2, schwa occurs between the first two consonants (C_1 and C_2) of the Root in order to syllabify this initial consonant cluster since there is a highly ranked constraint against complex onsets (*COMPLEX ONSET) in Sliammon (cf. §3.2.2.1). Furthermore, insertion of an epenthetic schwa [NUC] satisfies Proper Headedness and the requirements that primary stress is aligned with the left-edge of the stem. Consider the following partial tableau which shows the ranking of *COMPLEX ONSET with respect to DEP[NUC]. Recall that schwa becomes [a] before [ʔ] (cf. §2.4.4.1), and that intervocalic R' are realized as VʔRV since there is a high-ranking constraint against R' in Onset position (cf. §5.2).

(29) θy̓aɬ θə́ʔyaɬ [θáʔyɛɬ] *lake*

θy̓aɬ	*COMPLEX ONSET	DEP[NUC]
☞ a. θə́ʔyaɬ [θáʔyaɬ]		*
b. θy̓áɬ	*!	

Contrast this with the diminutive examples in (28.a'-f') in which the first consonant of the Root (C_1) functions as the coda to the first syllable whereas the second consonant (C_2) of the Root functions as the onset to the second syllable. Since the consonants are syllabified, schwa epenthesis is not required. Furthermore, the vowel of the diminutive prefix receives primary stress. It therefore satisfies both the Align L constraint and Proper Headedness (cf. Chapter 3). Since the constraints which drive schwa epenthesis are satisfied, there is no reason to have surface [ə] in the post-tonic unstressed syllable. The fact that schwa is not present between C_1 and C_2 of the Root is indicated by the underlined space __ in Column 2. (Note: I have not presented a formal account of Reduplication here - or established how to define the Base for purposes of Reduplication. Since Diminutive Reduplication involves syncope of the Full Vowel, this seems to entail checking that the vowel of the Input is identical to the vowel of the Reduplicant (I-R relation, in sense of McCarthy and Prince 1995; see Shaw (1998) on Lillooet Diminutive Reduplication). The purpose here is to compare morphologically related words - simplex and related reduplicative forms.

A further instance of ə alternating with Ø is shown by the Perfective and Imperfective pairs in (30). (Here I am assuming that Base-Reduplicant (B-R) Identity is an Output-Output relation, following M&P (1995), as indicated in Column 2).

(30) **Epenthetic Schwa**

	Input	**Red+Base**	**Schwa ~ Ø**	**Output**	**Gloss**
a.	ƛpxʷ		ƛə́pxʷ	ƛə́pxʷ	*break*
a'.	IMP-ƛpxʷ-t č	IMP-(ƛə́pxʷəč)	ƛə́-ƛ<ə>pxʷəč	ƛə́-ƛpxʷəč	*I'm breaking it*
b.	θt̓ᶿ-m		θə́ʔt̓ᶿəm	θáʔt̓ᶿəm	*jig for cod*
b'.	IMP-θt̓ᶿ-m+[ʔ] č	IMP-(θə́t̓ᶿəm̓č)	θə́-θ<ə>t̓ᶿəm̓č	θɩ́θt̓ᶿəm̓č	*I'm jigging*
c.	ǰƛ̓		ǰə́ƛ̓	ǰɩ́ƛ̓ ~ ǰɛ́ƛ̓	*to run*
c'.	IMP-ǰƛ̓	IMP-(ǰə́ƛ̓)	ǰə-ǰ<ə>ƛ̓	ǰíyƛ̓ ~ ǰí:ƛ̓	*he's running*
d.	nš-m		nə́šəm	nɩ́šəm	*swim*
d'.	IMP-nš-m+[ʔ]	IMP-(n̓ə́šəm)	nə-n̓<ə>šəm	nɩ́n̓šəm	*swimming*
e.	k̓ʷɬ		k̓ʷə́ɬ	k̓ʷʊ́ɬ	*spill*
e'.	IMP-k̓ʷɬ	IMP-(k̓ʷə́ɬ)	k̓ʷə-k̓ʷ<ə>ɬ	k̓ʷúk̓ʷɬ ~ k̓ʷʊ́k̓ʷɬ	*spilling*
f.	kʷɬ-t		kʷə́ɬt	kʷə́ɬt	*untie it*
f'.	IMP-kʷɬ-t	IMP-(kʷə́ɬt)	kʷə-kʷ<ə>ɬt	kʷʊ́kʷɬt	*untying it*
g.	č̓ɬ		č̓ə́ɬ	č̓ɩ́ɬ	*rain*
g'.	IMP-č̓ɬ	IMP-(č̓ə́ɬ)	č̓ə-č̓<ə>ɬ	č̓íč̓ɬ ~ č̓ɩ́č̓ɬ	*raining*

h. x̌ʷƛ̓=igan   x̌ʷə́ƛ̓igan   x̌ʷáʔƛ̓egʌn   *half full*

h'. IMP-x̌ʷƛ̓=igan   IMP-(x̌ʷə́ƛ̓igʌn) x̌ʷə́-x̌ʷ<ə>ƛ̓igʌn   x̌ʷáx̌ʷƛ̓egʌn   *half filling*

In (30.a-h), schwa occurs between the first two consonants of the Root (C_1 and C_2) in order to syllabify this initial consonant cluster and satisfy the metrical constraints, just as in (28) above. Contrast this with the Imperfective example in (30.b') in which the first consonant of the Root (C_1) functions as the coda to the first syllable whereas the second consonant of the Root (C_2) is the onset to the second syllable. In this case, both consonants are syllabified, and schwa does not occur, as indicated by the <ə>. Note that the Imperfective reduplicative prefix also bears primary stress. It occurs within the stem domain and satisfies the constraints on Proper Headedness and Align L.

4.2.3 Proposed Analysis

McCarthy and Prince (1994), Alderete (1997), van Oostendorp (1999) posit a constraint *SCHWA which is a particular instantiation of the family of *Structure constraints. *SCHWA is a constraint which assigns a cost to each instance of schwa which appears in the Output and is a general ban against additional unmotivated structure. Van Oostendorp (1999) suggests that evidence for such a constraint comes from languages which ban schwa all together, and from other languages in which schwa has limited distribution. The constraint *SCHWA will prevent rampant insertion of schwa ; schwa will only appear in those contexts in which it is constrained to do so by some higher-ranking constraint within the grammar. I adopt DEP[NUC] as the correspondence version of this constraint, following Shaw (1995, 1996) (cf. M&P 1995 on Correspondence). Schwa epenthesis, which is claimed to be insertion of a bare Nucleus within the Nuclear Moraic Model, incurs a violation of DEP[NUC].

If there is a cost associated with schwa [NUC] epenthesis, then we can explain why we get /ƛpxʷ/ ƛ[ə́]pxʷ *break* and /IMP-ƛpxʷ-t č/ ƛ[ə́]ƛp . xʷʌč *I'm breaking it* but not *ƛ[ə]ƛ[ə]pxʷʌč which entails an additional instance of schwa epenthesis which is not needed in order to satisfy constraints on prosodic structure. The ungrammatical form *[ƛə́ . ƛəp . xʷʌč] also violates the constraint which bans stressed schwa in an open syllable ($*\acute{ə}]_\sigma$) which will be discussed in Chapter 5.

All Sliammon scholars to date have noted that primary stress in the language tends to be word-initial. Following Blake (1999) this is analyzed as resulting from a high-ranked constraint which ensures that the left-edge of the prosodic word (PrWd) is aligned with the left-edge of the lexical stem.

(31) Align L

The left-edge of the prosodic word (PrWd) is aligned with the left-edge of the stem

This constraint interacts with Proper Headedness is repeated here in (32), following Shaw's (1996c) formulation.

(32) **Proper Headedness** Shaw (1996c:10) (cf. Ito and Mester 1992; Ola 1995)

a. PROPHEAD $_{PW}$ — A Prosodic Word is headed by a Foot

b. PROPHEAD $_{FT}$ — A Foot is headed by a Syllable

c. PROPHEAD $_\sigma$ — A Syllable is headed by a NUC [=SYLL NUC]

By epenthesizing schwa between C_1 and C_2 of the Root in (30.a-h) above, the syllable structure constraint which strongly disprefers complex onsets (*COMPLEX ONSET) in the language is also satisfied (cf. (29)).

(33) Tableau: ƛpxʷ ƛə́pxʷ break

ƛpxʷ	ALIGN L PRWD	PROPER HEAD	COMPLEX ONSET	DEP[NUC]
☞ a. (ƛə́pxʷ)				*
b. ƛ(pə́xʷ)	*!			*
c. (ƛpxʷ)		*!		
d. (ƛpə́xʷ)			*!	*

To summarize, epenthetic schwa in Sliammon plays several important functions: (i) epenthetic schwa satisfies syllable structure constraints, the one motivated here being the ban on Complex Onsets (cf. §3.2.2.1), (ii) it provides a nucleus (i.e. a head) which satisfies the constraint which ensures that the Foot which is the head of the prosodic word is properly headed, (iii) it ensures that stress is located as close to the left-edge of the stem as possible, and (iv) an epenthetic [NUC] is epenthesized into a word-internal syllable in order to create structures which avoid violations of *CLASH. The fact that epenthetic schwa does not occur in all metrically weak word-final CC syllables is discussed in §3.2.2.3.1.

4.3 Full Vowel Reduction

4.3.1. The problem

Sliammon has a large number of related words which show full vowels alternating with lax vowels, as illustrated by the data in (34). The syllables showing the alternations are underlined in the Output column of (34).

(34) **Full Vowels Alternate with Lax Counterparts**

	Input		**Output**	**Gloss**
a.	yax̌-t-anapi-as-'uɬ	yax̌-[a]t-anapi-s-uɬ	yɛ́ .x̌a .tà .na .<u>pè</u> .sɔɬ	*He was thinking of you*
a'.	yax̌-t-anapi č	yax̌-[a]t-anapi č	yɛ́ . x̌a . tà . na . <u>pɩč</u>	*I remembered you (pl)*
b.	hi hw č x̌aƛ̓-ng-mi	hihiwč x̌aƛ̓numi	hɛ́:wč x̌áƛ̓ . no . <u>me</u> .	*I love you very much*
b'.	x̌aƛ̓-ng-mi č	x̌aƛ̓numič	x̌áƛ̓ . no . <u>mɩč</u> .	*I love you (sg)* [3]
c.	ʔawukʷ-hV č	ʔawu-hu-kʷ č	ʔʌ́ . <u>wo</u> . hòkʷč	*I have tobacco*
c'.	ʔawukʷ	ʔawukʷ	ʔá . <u>wʊkʷ</u> ~ ʔʌ́<u>wʊkʷ</u>	*tobacco*

[3]Notice that if this proposal is correct, then this constitutes evidence that the first person subject clitic č *I* in these contexts is syllabified with the preceding object suffix and is therefore part of the Prosodic Word domain. This will become important in determining the position of clitics within prosodic and morphological domains, and is identified as a topic for future research (cf. Selkirk 1995 on the position of clitics, and Watanabe 2000 on clitics in Sliammon).

d.	t̓ug-θ-as	t̓ug-[u]-θ-as	t̓ó . gu . θʌs	*she recognizes me*
d'.	t̓ug-t č	t̓ug-[ə]<t>č	t̓ó . gʊč	*I recognize her*
e.	DIM-mix̌aɬ=uɬ	mi-m<i>x̌aɬuɬ	mέm . x̌a . ɬòɬ	*black bear cub*
e'.	mix̌aɬ	mix̌aɬ	mέ . x̌ʌɬ	*black bear*
f.	ʔiɬtan-hV č	ʔiɬta-ha-n č	ʔέɬ . ta . hʌnč	*I've got food*
f'.	ʔiɬtan	ʔiɬtan	ʔέɬ . tʌn	*eat, food*
g.	sup=nač-hV a	supna-ha-č a	sóp . na . hà . ča .	*Has he got a tail?*
g'.	sup=nač	supnač	sóp . nʌč	*tail*

Notice that /i/ is realized as [e] in an open syllable (34.a-b) whereas it surfaces as [ɩ] in a closed syllable (34.a'-b'). The vowel /u/ is [o, u] in an open syllable (34.c-d) whereas it surfaces as its lax [ʊ] counterpart in an unstressed closed syllable, as in (34.c'-d'). The vowel /a/ is realized as [a] in an open syllable as in (34.e-g) whereas it surfaces as [ʌ] in a closed syllable, as in (34.e'-g'). The full vowel counterparts occur in unstressed open syllables whereas the lax variants occur in unstressed closed syllables. The alternation between the tense and lax vowels is referred to here as Full Vowel Reduction, following Blake (1999).

The question which is addressed in the next section is what is the appropriate characterization of Full Vowel Reduction in Sliammon? What is clear about Full Vowel Reduction (or shortening) in Sliammon is that it is crucially dependent on Stress Assignment.

4.3.2 Full Vowel Reduction and Stress Assignment

It is hypothesized that Full Vowel Reduction is driven by Foot structure constraints in the following way. Recall that syllables in Sliammon are grouped together into left-dominant feet (or trochees) as discussed in §3.3. Feet are proposed to be ideally bi-moraic (μμ) (that is they satisfy FtBinμ) but may be tri-moraic (μμμ) (i.e. an "uneven" trochee), under pressure to incorporate moras into syllables (Parse-μ-to-σ), and incorporate syllables into Feet (Parse-σ-to Foot). The best foot of course is the one which satisfies both FTBINμ and FTBINσ (i.e. Cv́ . Cv). Since output forms cannot satisfy all conflicting constraints simultaneously, the optimal form will be the one which is most harmonic and incurs minimal constraint violation. Under the hypothesis that a full vowel is moraic and a reduced vowel is not, Full Vowel Reduction can be explained as follows: A full vowel in a weak metrical position loses a mora $<\mu>$ in order to optimize the resulting Foot structure. Full Vowel Reduction occurs in order to create a well-balanced bi-syllabic bi-moraic trochee or a quantitatively 'even' trochee, as discussed in §4.3.2.1, and also occurs in order to create a single bisyllabic trimoraic foot, as will be shown in §4.3.2.2.

4.3.2.1 Bisyllabic Bimoraic Foot

Kager (1995: 400) in his summary of stress systems states that languages which have moraic trochees "are predicted to display processes that increase durational evenness within the foot." Shortening to a reduced full vowel can be viewed as a prosodic constraint which "modifies an uneven trochee into a rhythmically balanced even bi-moraic trochee". This is represented here as shown in (35).

(35)

	Input	Output
a.	$(\sigma_{\mu\mu}\ \sigma_{\mu})_{\mathrm{Ft}}$	$(\sigma_{\mu}\ \sigma_{\mu})_{\mathrm{Ft}}$

This is similar to what happens in Sliammon. As shown by the Sliammon data in (36), vowel reduction occurs in the unstressed syllable, underlined in Column 3.

(36)

	Input	V-reduction	Output	Gloss
a.	gaqiθ	gáqεθ	gáqεθ	*husband*
b.	qx̌-mut	qə́x̌mʊt	qʌ́x̌mʊt	*many, lots*
c.	qigaθ	qígʌθ	qégʌθ	*deer*
d.	miǰaθ	míǰʌθ	míǰʌθ	*flesh, meat*
e.	č̓t-t-as	č̓ə́t-tʌs	č̓íttʌs	*he cut it*

The loss of a mora creates an optimal bi-moraic trochee, by reducing the phonological weight of the non-head, as shown schematically in (37). In the Output, each syllable within the Foot contains a mora: ($\acute{\sigma}_{\mu}$. σ_{μ}).

(37)

	Input	Output	
a.	($\acute{\sigma}_{\mu}$. $\sigma_{\mu\mu}$)	($\acute{\sigma}_{\mu}$. $\sigma_{<\mu>\mu}$)	*($\acute{\sigma}_{\mu}$. $\sigma_{\mu\mu}$)

In particular, the constraint PEAK PROM FT makes sure that the head of the Foot is equal to (or greater than) the phonological weight of the non-head. The data in (38) show the contrast between the licit forms in Column 2 which have undergone vowel reduction in comparison to the ungrammatical but totally faithful candidates in (38) Column 3.

(38)

	Input	**V-reduction**	***V-reduction**	**Gloss**
a.	gaqiθ	gáμ . qεθμ	*gáμ . qeμθμ	*husband*
b.	qx̌-mut	qə́x̌μ . mʊtμ	*qə́x̌μ . muμtμ	*many, lots*
c.	qigaθ	qéμ . gʌθμ	*qéμ . gaμθμ	*deer*
d.	miǰaθ	míμ . ǰʌθμ	*míμ . ǰaμθμ	*flesh, meat*
e.	čt-t-as	čətμ . tʌsμ	*čə́tμ . taμsμ	*he cut it*

Since stress is always fixed on the word-initial syllable in Sliammon, surface candidates like those in (38) Column 3 are ill-formed since the syllable which functions as the weak member of the Foot is heavier (μμ) than the head of the Foot (μ). Shaw (1998) proposes the constraint PEAK PROM FT (as a refinement of PEAK PROM as defined by Prince and Smolensky 1993) which captures the generalization that the prominence of the head of a Foot (as defined by moraic weight) is greater than or equal to the prominence of the non-head.

(39) PEAK PROM FT

The prominence of the Head of a foot ≥ the non-head.

i.e. FT= (v́ ...v), (v́....ə), (ə́...ə), *(ə́...v)

The idea here is that the weight of the stressed syllable as a whole, not just the nuclear head is equal to or greater than the phonological weight of the unstressed syllable: FT=(σ́μμ σμ) , (σ́μμ σ), (σ́μ σμ), *(σ́ σμ), *(σ́μ σμμ). The loss of a mora <μ> is therefore a minimal violation of Faithfulness which satisfies this constraint PEAK PROM FT. It also creates an even bi-moraic trochee which best satisfies Foot Binarity (cf. §4.7 for a summary of the constraints).

(40) gaqiθ [gáqεθ] *husband*

gaqiθ μ . μμ	PEAK PROM FT	STRESS-TO-W	*CLASH	FTBINμ	MAX[μ]
☞ a. gá . qεθ μ . <μ> μ		*			*
b. gá . qeθ μ . μ μ	*!	*		*	
c. gá: . qεθ μμ . μ				*	

Candidate (40.c) requires some discussion. Given the present constraint ranking, we might ask what prevents the three moras from being distributed such that the stressed syllable contains a long vowel. If the moras are linked to the vowels in the Input, then (40.c) will violate constraints on the insertion and deletion of Paths (autosegmental associations between Root node and mora; cf. Archangeli and Pulleyblank 1994).

4.3.2.2 Bisyllabic Trimoraic Foot

In the this case, vowel reduction reduces the total number of moras from four to three so that both syllables can be incorporated into a single metrical Foot. Vowel reduction occurs in metrically weak (unstressed) syllable, as shown schematically in (41).

(41)

	Input	**Output**	
a.	$(\sigma_{\mu\mu} \,.\, \sigma_{\mu\mu})$	$(\acute{\sigma}_{\mu\mu} \,.\, \sigma_{<\mu>\mu})$	$*(\acute{\sigma}_{\mu\mu} \,.\, \sigma_{\mu\mu})$

Consider the data in (42) which provides motivation for this claim. (Recall that schwa becomes [ɛ] after an alveopalatal and before a glottal, as discussed in Chapter 2. This accounts for the surface form in (42.a)).

(42) **Root-suffix**

	Input	**V-Reduction**	**Output**	**Gloss**
a.	šʔt-mut	šə́ʔt . mʊt	šə́ʔtmʊt [šɛ́ʔtmʊt]	*very high*
b.	sup=nač	súp . nʌč	sópnʌč	*tail*
c.	tʼ$^{\theta}$iyč̓=aǧič	tʼ$^{\theta}$íy . č̓aʔ . gɩč	tʼ$^{\theta}$íyč̓àʔgɩč	*twisted spine*

As shown by the examples in (42), the vowel in the unstressed syllable is "reduced" in the surface form: /u/ [ʊ] as in (42.a), and /a/ [ʌ] as in (42.b), and /i/ [ɩ] as in (42.c). Full Vowel Reduction is interpreted as a reduction in vowel *quantity* (i.e. the loss of a mora) since it is clearly motivated by Stress Assignment (i.e. the prosodic constraints on Foot Structure), as shown in (43).

Note that in (42.c) it is the second Foot (č̓àʔgɩč^{h})$_{Ft}$ in (tʼ$^{\theta}$íy)$_{Ft}$(č̓àʔgɩč^{h})$_{Ft}$ *twisted spine* which undergoes reduction, as indicated by the Foot structure in (43.c).

(43)

	Input	Foot Structure	No Reduction	Gloss
a.	šʔt-mut	(šə́ʔt$_{\mu\mu}$.mʊt$_{\mu}$)	*(šə́ʔtμμ . mutμμ)	*very high*
b.	sup=nač	(sópμμ . nʌčμ)	*(sópμμ . načμμ)	*tail*
c.	t̓ᶿiyč̓=ag̓ič	(t̓ᶿíy)(č̓àʔμμ . gɩčμ)	*(t̓ᶿíy)(č̓àʔμμ . gičμμ)	*twisted spine*

Vowel reduction in Sliammon is analyzed here as the loss of the mora <μ> associated with the vowel in the second syllable without any alteration to either its nuclear (NUC) or featural content. What is significant about this proposal is that full vowel reduction is characterized as a change in vowel quantity and not vowel quality. Recall that §2.4.5 establishes that the realization of reduced full vowels is distinct from that of schwa. Since the head of the Foot (i.e. the stressed syllable) prefers to be prominent, it is the vowel in the weak syllable which surfaces as non-moraic, excluding surface forms like the ones in (44) Column 3.

(44) Vowel Reduction does not take place in a stressed syllable

	Input	Output	*Reduction	Gloss
a.	šʔt-mut	šɛ́ʔtmʊt	*(šɛ́ʔt$_{\mu}$. mut$_{\mu\mu}$)	*very high*
b.	sup=nač	sópnʌč	*(sɔ́p$_{\mu}$. nač$_{\mu\mu}$)	*tail*
c.	t̓ᶿiyč̓=ag̓ič	t̓ᶿíyč̓àʔgɩč	*(t̓ᶿíy)(č̓ʌʔ$_{\mu}$. gič$_{\mu\mu}$)	*twisted spine*

Recall that stress is strictly word-initial in Sliammon regardless of the quality of the initial vowel (see §3.3, as well as Davis (1970), Hagège (1981), Kroeber (1989), Blake (1992, 1995), Watanabe (1994), and Urbanczyk (1999)). In (41-42) above, vowel reduction <μ> not only allows both syllables to be incorporated into a single metrical foot, but it also enhances the relative prominance of the head of the Foot. The cost associated with Full Vowel Reduction is a MAX-μ violation. The fact that stressed syllables prefer to be heavy is encoded in the following constraint, following Prince and Smolensky (1993) and others, including Blake (1995, 1999).

(45) Stress to Weight

A stressed syllable prefers to be heavy

Consider the partial tableau in (46) which shows how this works.

(46) sup=nač [sópnʌč] *tail*

sup=nač ($\mu\mu$. $\mu\mu$)	STRESS TO WEIGHT	FTBINμ	MAX[μ]
☞ a. (só$_\mu$p$_\mu$. nʌč$_\mu$)		*	*
b. (só$_\mu$p$_\mu$. na$_\mu$č$_\mu$)		*!*	
c. (sɔ́p$_\mu$. nʌč$_\mu$)	*!		**
d. (sɔ́p$_\mu$. na$_\mu$č$_\mu$)	*!	*	*

What rules out candidates like (só$_\mu$p$_\mu$)(nà$_\mu$č$_\mu$) in which there is total faithfulness (correspondence) between moras? In this case, seems that *CLASH must be ranked higher than FTBINμ, as shown in (47).

(47)

sup=nač $\mu\mu$ $\mu\mu$	STRESS-TO-WEIGHT	*CLASH	FTBINμ	MAX[μ]
☞ a. (só$_\mu$p$_\mu$. nʌč$_\mu$)			*	*
b. (só$_\mu$p$_\mu$) (nà $_\mu$č$_\mu$)		*!		

Notice that (47.a) also satisfies FTBINσ since the output is comprised of a single bi-syllabic foot whereas (47.b) violates FTBINσ twice. In the non-optimal form (47.b) there are two feet, and each foot is comprised of a single syllable which violates FTBINσ twice.

4.3.2.3 The Representation of Vowel Reduction

A reduced full vowel (R-schwa) is analyzed here as a nuclear non-moraic vowel (i.e. schwa) which has the place specifications of the underlying full vowel, as shown in (48).

(48) Nuc
|
RN
Place
|
[f]

Full Vowel Reduction incurs the loss of a mora, as shown in (49). Notice that the vocalic place features remain unchanged.

(49)

Input	**Output**
NUC	NUC
|	|
μ	$<\mu>$
|	|
RN	RN
Place	Place
[f]	[f]

As can be seen from the phonological representation in (49), the Output of Full Vowel Reduction is distinct from epenthetic schwa [NUC] which is devoid of inherent place features. Epenthetic schwa is realized as [ɩ~ ɨ , ɛ , ʊ, ɔ, ʌ, a] depending on the adjacent consonants and vowels, as shown in Chapter 2. Recall that the distinction between a reduced full vowel and epenthetic schwa (E-schwa) is manifest in surface representations in Sliammon, as discussed in §2.4.5.

The claim made in this section is that full vowel reduction in Sliammon is not the loss of the phonological features associated with the vowel; rather it is construed as the loss of phonological weight, i.e. as the loss of a mora. The resulting "reduced" full vowel has the prosodic representation of schwa since it is Nuclear (NUC) but non-moraic, but retains the inherent feature specification of the full vowel. It is claimed here that it is this duality which defines a reduced vowel.

4.3.2.4 Contexts in which Full Vowel Reduction (R-schwa) is Blocked

Although many post-tonic full vowels surface as a reduced full vowel, there are a systematic set of cases in which vowel reduction is blocked. In the examples in (50), a full vowel appears in the Output instead of a reduced vowel. As expected under the present analysis, vowel reduction does not seem to take place as freely in a bimoraic, bi-syllabic Foot of the form (Cv́$_{\mu}$. Cv$_{\mu}$) as shown by a comparison between the data in Column 2, and the less optimal forms in Column 3.

(50) Vowel reduction is blocked: ($\mu\mu$) → *(μ)

Output form	Morafication / Footing	*Vowel Reduction	Gloss
a. gágeθègʌn	(gá$_{\mu}$. ge$_{\mu}$)(θè$_{\mu}$. gʌn$_{\mu}$)	*(gá$_{\mu}$. gɛ)(θè$_{\mu}$. gʌn$_{\mu}$)	*doe, female deer*
b. túwumày̓ɛ	(tú$_{\mu}$. wu$_{\mu}$)(mà$_{\mu}$. y̓a$_{\mu}$)	*(tú$_{\mu}$. wʊ)(mà$_{\mu}$. y̓a$_{\mu}$)	*cold wind, Westerly*
c. t̓$^{\theta}$át̓$^{\theta}$awùšɩn	(t̓$^{\theta}$á$_{\mu}$. t̓$^{\theta}$a$_{\mu}$)(wù$_{\mu}$. šɩn$_{\mu}$)	*(t̓$^{\theta}$á$_{\mu}$. t̓$^{\theta}$ʌ)(wù$_{\mu}$. šɩn$_{\mu}$)	*hail*
d. k̓^{w}ásasàʔʌq	(k̓^{w}á$_{\mu}$. sa$_{\mu}$)(sà$_{\mu}$. ʔʌq$_{\mu}$)	*(k̓^{w}á$_{\mu}$. sʌ)(sà$_{\mu}$. ʔʌq$_{\mu}$)	*becoming warmer*
e. náč̓aw̓ìgɩɬ	(ná$_{\mu}$. č̓a$_{\mu}$)(w̓ì$_{\mu}$. gɩɬ$_{\mu}$)	*(ná$_{\mu}$. č̓ʌ)(w̓ì$_{\mu}$. gɩɬ$_{\mu}$)	*one boat*
f. ƛ̓áx̌ajùnɩs	(ƛ̓á$_{\mu}$. x̌a$_{\mu}$)(ǰù$_{\mu}$. nɩs$_{\mu}$)	*(ƛ̓á$_{\mu}$. x̌ʌ)(ǰù$_{\mu}$. nɩs$_{\mu}$)	*wisdom teeth*
g. tátoθènʌč	(tá$_{\mu}$. to$_{\mu}$)(θè$_{\mu}$. nʌč$_{\mu}$)	*(tá$_{\mu}$. tɔ)(θè$_{\mu}$. nʌč$_{\mu}$)	*gluteous muscle*

The relevant generalization is that the weak metrical syllable is in all these cases an open syllable. If vowel reduction is the loss of a mora, then we can explain why it is blocked in this context.

Vowel reduction in this context would create a less optimal mono-moraic $(\acute{\sigma}_{\mu}\ \sigma)$ Foot, which violates FTBINμ. I conclude that the constraint which ensures that Feet are minimally bi-moraic (FTBINμ) must be relatively high-ranking in Sliammon, as argued in Chapter 3. This is contrasted with cases like those in (36-38) in which vowel reduction *does* take place in order to ensure that Feet are binary at the moraic level.

4.3.3 Implications of the Proposed Analysis of Full Vowel Reduction

4.3.3.1 Imperfective Reduplication and reduced full vowel

Consider the interaction between Imperfective reduplication and Full Vowel Reduction. Strong Roots (i.e. Roots with an initial full vowel i, u, a) take an initial CV- reduplicant in the Imperfective and retain the root vowel, as shown by the data in (51). The syllabification of each of the following Imperfective forms is affected by suffixation. This will subsequently be constrasted with the realization of non-suffixed Imperfective reduplicative data.

(51)

	Input	Red+Base	Output	Gloss
a.	t̓in		t̓ɛ́n	*barbecued fish*
a'.	IMP-t̓in-ʔəm	IMP-(t̓ínʔəm)	t̓ɛ́t̓ɛnʔəm	*barbecuing (fish)*
b.	ʔilq̓=ay		ʔɛ́lq̓ay	*barbecue deer meat*
b'.	IMP-ʔilq̓=ay	IMP-(ʔílq̓ay)	ʔɛ́ʔɛɬq̓ày	*barbecuing deer meat*
c.	ǰuθ-t		ǰúθʊt	*to push s.t.*
c'.	IMP-ǰuθ-t-as	IMP-(ǰúθutas)	ǰúǰuθotʌs	*s/he is pushing it*
d.	sup-ʔm		sóp̓əm	*to chop wood*
d'.	IMP-sup-ʔm	IMP-(súpʔəm)	sósop̓əm	*chopping (s.t.)*
e.	qʷas-m		qʷásəm	*flower*
e'.	IMP-qʷas-m+[ʔ]	IMP-(qʷásəm̓)	qʷáqʷasəm̓	*blooming, flowering*
f.	ʔaθ-ʔm		ʔáθ(ʔ)ʌm	*to give (like at a potlatch)*
f'.	IMP-ʔaθ-ʔm	IMP-(ʔáθəm̓)	ʔáʔaθʌm̓	*giving*

Notice that both the full vowel of the reduplicant and the full vowel of the Root may occur in open syllables, as indicated by the underlined portion in (51.c'-f') Column 3. Also notice that the relationship between the Base and the Reduplicant requires that the vowel of the Root and the vowel of the reduplicant have the same basic vowel quality (i.e. Ci-CiC, Cu-CuC, Ca-CaC). They are still subject to height/place assimilation constraints discussed in Chapter 2, as shown by the data in (52). In (52.a'), the vowel /i/ is realized as [e] before k̓ʷ and as [i] between coronals. In (52.b') /u/ is realized as [u] in the environment of alveopalatals and as [o] before x̌ʷ.

(52)

	Input	Red+Base	Output	Gloss
a.	ɬik̓ʷ-ʔm		ɬík̓ʷəm ~ ɬík̓ʷʊm	*to sew (s.t.)*
a'.	IMP-ɬik̓ʷ-ʔm	IMP-(ɬík̓ʷəm̓)	ɬíɬek̓ʷəm̓~ ɬíɬek̓ʷɔm̓	*sewing (s.t.)*
b.	ǰux̌ʷ-t		ǰóx̌ʷət	*vomit*
b'.	IMP-ǰux̌ʷ-t	IMP-(ǰúx̌ʷət)	ǰúǰox̌ʷʌt	*vomiting*

Now consider what happens to the Root vowel in unsuffixed Imperfective forms. As shown by the data in (53.a-c) Column 3, the Root vowel surfaces in an unstressed closed syllable (relevant syllable is underlined). The Root vowels vary somewhat in their realization [o ~ ɔ] and [a ~ ʌ].

(53)

	Input	Red+Base	Output	Gloss
a.	IMP-ƛ̓up	IMP-(ƛ̓úp)	ƛ̓óƛ̓op ~ ƛ̓óƛ̓ɔp	*it's healing*
a'.	ƛ̓up		ƛ̓óp	*to heal, heal up*
b.	IMP-ʔaxʷ	IMP-(ʔáxʷ)	ʔáʔaxʷ	*snowing*
b'.	ʔaxʷ		ʔáxʷ	*snow* (falling)
c.	IMP-yax̌	IMP-(yáx̌) ya-yax̌	yɛ́yʌx̌	*sobering up*
c'.	yax̌		yɛ́x̌	*to sober up*

The question which is raised here is do Root vowels in a Base-Reduplicant relation also undergo full vowel reduction in closed unstressed syllables? The output forms in (53) suggest that full vowel reduction occurs here as well. If reduction is the loss of a mora as argued above, and the phonological features of the full vowel are retained, then the vowel of the Base and the vowel of the Reduplicant still satisfy the Indentity constraint on Vowel feature specifications. It appears to be possible to satisfy the prosodic constraints which drive Full Vowel Reduction and the vowel Identity constraint on vowel features at the same time. Although the interaction between Full Vowel Reduction and other morphological processes, especially Reduplication, requires further research, the initial findings discussed here provide support for the proposed analysis of Full Vowel Reduction.

4.3.3.2 Height Assimilation independent of Full Vowel Reduction

Consider the examples in (54) which show that stressed á varies between [á ~ ʌ́]. It is worthwhile to point out that these instances of [ʌ́] cannot be the result of Full Vowel Reduction because they are all stressed.

(54)

	Input		Output	Gloss
a.	tan	tan	tán ~ tʌ́n	*mother*
b.	man	man	mán ~ mʌ́n	*father*
c.	nat	nat	nát ~ nʌ́t	*night*

It is necessary to distinguish the examples in (54) from examples like those in (34) above, since if the variant [ʌ́] in (54) were the result of Full Vowel Reduction, then these examples would be mono-moraic. As shown in Chapter 3, independent words tend to satisfy Minimality; that is they are minimally bimoraic. The variation between [á ~ ʌ́] cannot be the result of Full Vowel Reduction since output forms like [tʌ́n<μ>μ] would be sub-minimal (i.e. mono-moraic), as shown by the contrast between the data in (55) Columns 2-3.

(55)

	Input	Ouput	*Vowel Reduction	Gloss
a.	tan	táμnμ ~ tʌ́μnμ	*tʌ́nμ	*mother*
b.	man	máμnμ ~ mʌ́μnμ	*mʌ́nμ	*father*
c.	nat	náμtμ ~ nʌ́μtμ	*nʌ́tμ	*night*

The alternations like tán ~ tʌ́n therefore must be due to something else. It is proposed here that this is vowel height assimilation before a coronal consonant. (Recall that the resultant height of the vowels i, u, a, ə is determined by the height of the adjacent consonants, as discussed in Chapter 2). This means that a following coronal consonant affects the height of /a/ but does not affect its prosodic representation. The independent existence of constraints on height/place assimilation at the sub-segmental level (via feature sharing) makes the identification of Full Vowel Reduction more difficult. The presence or absence of stress provides some evidence. Full Vowel Reduction is therefore complicated somewhat by the independent existence of vowel-consonant interaction in the language.

4.3.3.3 Summary of Full Vowel Reduction

Consider the Output representation of a Reduced Full Vowel repeated here in (56) in which the Nucleus dominates the inherent features [f].

(56)

Nuc
|
<μ>
|
[f]

Given the distinction between Nuclear versus Nuclear moraic vowels inherent in the Nuclear Moraic Model adopted in this thesis (Shaw 1993 et seq.), the inventory of Output vowels is exactly what we might expect given the range of possible combinations. Since all vowels are Nuclear, consider the possible logical combinations of the Nucleus (NUC) with moras and features presented in (57).

(57)

Full Vowel	Reduced Full Vowel	E-Schwa	Epenthetic Full V
Nuc | μ | [f]	Nuc | <μ> | [f]	Nuc	Nuc | μ
i, e, u, o, a	[ɩ, ɛ, ʊ, ɔ, ʌ]	[ə]	[V]

So far we have discussed the contrast between Full vowels, epenthetic schwa (E-Schwa) and Reduced Full Vowels. The fourth logical possibility is represented in (57) Column 4. This is the representation of an epenthetic Full Vowel. We now turn to discussion of Full Vowel epenthesis as an instance of Vowel Strengthening in the next section. What is of particular interest is the fact that Weak Roots (Roots which typically surface with an initial schwa) show schwa/full vowel alternations. It is proposed that these are cases in which schwa is strengthened to a full vowel.

4.4 Strengthening of Schwa: Schwa / Full Vowel Alternations

Strengthening of Stressed Syllables

Kager (1995: 367) notes that "stress tends to be enhanced segmentally: stressed syllables may be strengthened by vowel lengthening or by gemination, while stressless syllables may be weakened by vowel reduction." There are a number of Roots in Sliammon which show many of the morphological diagnostics for Weak Roots (i.e. /CC/ CəC, /CCC/ CəCC) but which surface with a full vowel in a stressed open syllable, instead of schwa. These schwa/full vowel alternations are proposed to follow from the well-formedness constraints on the prosodic representations. The presence of a full vowel, instead of schwa, can be viewed as a form of strengthening or fortition which favours a nucleus with phonological weight (NUCμ) in a stressed open syllable. Kinkade (1997) makes a similar observation and proposal for Upper Chehalis

(Tsamosan Salish) showing that schwa alternates with full vowels; the full vowel occurs in a stressed open syllable (cf. Rowicka (2000) for a theoretical treatment within a Strict CV- model of syllable structure, citing data from Kinkade 1991).

4.4.1 The Data

The following data show alternations between stressed schwa in a closed syllable (58.a-d) versus a full vowel in a stressed open syllable (58.a'-d'). This first set of data shows ə́ ~ ú; other data exemplify ing ə́ ~ á follow in (61-63). The epenthetic vowels which alternate appear in square brackets [ ] in Column 2 and are underlined in Column 3.

(58) ə́ ~ ú

	Input	ə́ ~ ú	Output	Gloss
a.	t̓$^{\theta}$k^{w}-t	t̓$^{\theta}$[ə́]k^{w}t	t̓$^{\theta}$ʊ́k^{w}t	*wipe s.t.*
a'.	t̓$^{\theta}$k^{w}=uy̌̓a=tn	t̓$^{\theta}$[ú]k^{w}uʔy̌atən	t̓$^{\theta}$ók^{w}uʔy̌àtən ~ tn̩	*napkin* (wipe=hands)
b.	x̌^{w}m	x̌^{w}[ə́]m	x̌^{w}ə́m	*swift, fast*
b'.	x̌^{w}m=aɬ=k^{w}u	x̌^{w}[ú]maɬk^{w}u	x̌^{w}ómaɬk^{w}u	*Homathko River*
c.	IMP-px^{w}[-i-]m+[ʔ]	p[ə́]px^{w}im̓	pʌ́px^{w}ɛm̓	*starting to steam*
c'.	px^{w}-m+[i]	p[ú]x^{w}im	púx^{w}em ~ púx^{w}ɛm	*steam*
d.	DIM-k^{w}θ=ays[-i-]	k^{w}[ə́]k^{w}θayis	k^{w}ə́k^{w}θayɩs	*small island*
d'.	k^{w}θ=ays	k^{w}[u]θays	k^{w}úθays ~ k^{w}ʊ́θays	*island*

Notice that epenthetic schwa (i.e. a bare NUC) [ʊ́, ə́ , ʌ́] tends to occur in a closed syllable whereas the full vowel ú [ó ~ ú] occurs in a stressed open syllable.

The ungrammatical forms in (59.a'-d') Column 3 show that schwa is avoided in a stressed open syllable. This is the context in which stressed ú occurs instead. Notice that the corresponding forms in (59.a-d) show that schwa does occur in an initial stressed syllable, if and only if the syllable is closed. The full vowel ú and schwa are in complementary distribution in this context.

(59)

	Input	Syllabification	Ungrammatical	Gloss
a.	t̓^{θ}k^{w}-t	t̓^{θ}[ə́]k^{w}t	*t̓^{θ}úk^{w}t	*wipe s.t.*
a'.	t̓^{θ}k^{w}=uǰ̓a=tn	t̓^{θ}[ú] . k^{w}uʔ . ǰa . tən	*t̓^{θ}ə́ . k^{w}uʔ . ǰa . tən	*napkin* (wipe=hands)
b.	x̌^{w}m	x̌^{w}[ə́]m	*x̌^{w}úm	*swift, fast*
b'.	x̌^{w}m=aɬ=k^{w}u	x̌^{w}[ú] . maɬ . k^{w}u .	*x̌^{w}ə́ . maɬ . k^{w}u	*Homathko River*
c.	IMP-px^{w}[-i-]m+[ʔ]	p[ə́]p . x^{w}im̓ .	*púp . x^{w}im̓ .	*starting to steam*
c'.	px^{w}-m+[i]	p[ú] . x^{w}im	*pə́ . x^{w}im	*steam*
d.	DIM-k^{w}θ=ays[-i-]	k^{w}[ə́]k^{w} . θa . yɩs	*k^{w}úk^{w} . θa . yis .	*small island*
d'.	k^{w}θ=ays	k^{w}[ú] . θays [k^{w}ʊ́...]	*k^{w}ə́ . θays	*island*

What seems to be happening is that Weak Roots take a schwa in order to ensure that the stressed syllable contains a Nucleus, satisfying Proper Headedness as argued in §4.2.3. In an open syllable, both a Nucleus and a mora surface in order to ensure that the head of the Foot has both a Nucleus and phonological weight, thus avoiding stressed schwa in an open syllable: *ə́$]_{σ}$. The fact that schwa tends not to occur in a stressed open syllable is explored in detail in Chapter 5.

It should be noted here that some Weak Roots also show variation in the way in which they are strengthened. As indicated above, stress can be enhanced either by (i) vowel lengthening (strengthening) or (ii) by gemination. The data in (60) show vowel strengthening in (60.a'-c') and consonant gemination in (60.a"-c"). The diminutive forms in (60.a-c) show that these are Weak Roots.

(60)

	Input	Epenthesis	Output	Gloss
a.	DIM-t̓^{θ}x̌u+[ʔ]	t̓^{θ}i-t̓^{θ}x̌^{w}uʔ	t̓^{θ}ít̓^{θ}x̌^{w}oʔ	*small ling cod*
a'.	t̓^{θ}x̌^{w}u	t̓^{θ}[ú]x̌^{w}u	t̓^{θ}óx̌^{w}o	*ling cod*
a".	t̓^{θ}x̌^{w}u	t̓^{θ}[ə́]x̌^{w}u	t̓^{θ}ɔ́x̌^{w}:o	*ling cod*

b. DIM-nxʷiL	ni-nxʷiɬ	nínxʷɩɬ	*small canoe*
b'. nxʷiL	n[ú]xʷiɬ	núxʷɩɬ	*dugout canoe*
b'. nxʷiL+hVPoss	n[ú]xʷi-hi-ɬ	núxʷehɛ̀ɬ	*he has a canoe*
b''. nxʷiL	n[ə́]xʷiɬ	nʊ́xʷːɩɬ	*dugout canoe*
c. DIM-ƛ̓x̌ʷay+[ʔ]	ƛ̓i-ƛ̓ . x̌ʷay̓ .	ƛ̓ɩ́ƛ̓x̌ʷay̓	*small chum*
c'. ƛ̓x̌ʷay	ƛ̓[ú] . x̌ʷay .	ƛ̓ʷóx̌ʷʌy	*chum, dog salmon*
c''. ƛ̓x̌ʷ=ay	ƛ̓[ə́]x̌ʷay	ƛ̓ɔ́x̌ʷːʌy	*chum salmon*

Clearly both strategies can be used in order to avoid stressed schwa in an open syllable. At the present time, it is unclear why the Roots in (60) variably show either Vowel Strengthening or Consonant Gemination whereas vowel strengthening alone is recorded for the data in (58-59).

It is proposed here that vowel strengthening is insertion of both a Nuc and a mora (a DEP NUC and a DEP-μ violation) in order to satisfy the constraints that the Foot is Properly Headed ***and*** bears phonological weight (cf. Chapter 3).

One question which we need to address is: if strengthening is insertion of [NUCμ], then how are the features of the full vowel determined? Why is the full vowel in (58-59) above realized as [ú ~ o] and not as [í ~ é] or [á]? It is proposed here that the features of the full vowel are determined by the nature of the adjacent consonants. In particular, the full vowel [u] appears to be epenthesized in a stressed open syllable in the environment of either a preceding or following labialized consonant. The vowel quality is due to assimilation (feature sharing) with adjacent consonants and is not determined by markedness considerations.

Now consider examples in which stressed ə́ in a closed syllable alternates with á in an open syllable.

(61) ə́ ~ á

	Input	Epenthesis	Output	Gloss
a.	x̌t̓k̓ʷ	x̌[ə́]t̓k̓ʷ	x̌ʌ́t̓k̓ʷ	*design*
a'.	x̌t̓k̓ʷ+[i]	x̌[á]t̓ik̓ʷ	x̌át̓ek̓ʷ	*design's already there*

b. t̓ə́lk̓-t	t̓[ə́]lk̓ət	t̓ə́lk̓ət	*make a hole*
b'. t̓lk̓+[i]	t̓[á]lik̓	t̓ʌ́lɛk̓ ~ t̓ʌ́lɪk̓	*a hole*
c. ʔsp̓	ʔ[ə́]sp̓	ʔə́sp̓	*finish*
c'. ʔsp̓+[i]	ʔ[á]sip̓	ʔʌ́sɛp̓	*it's finished*
d. ƛ̓ms=tan	ƛ̓[ə́]mstən	ƛ̓ə́mstən	*village, community*
d'. ƛ̓ms+[i]	ƛ̓[a]mis	ƛ̓ʌ́mɛs ~ ƛ̓ámɛs	*where one resides*

Syllabification of these examples in (62.a'-d') Column 3 shows that schwa is avoided in a stressed open syllable. Notice that while the less optimal examples in (62.a'-d') Column 3 are bimoraic, the head of each Foot is weightless and the non-head is heavy (bimoraic). This is clearly less optimal than the attested Output forms in (62.a'-d') Column 2. The Output forms in (62.a'-d') Column 2 show that vowel strengthening ensures that a full vowel occurs in a stressed open syllable.

(62)

Input	**Syllabification**	**Ungrammatical**	**Gloss**
a. x̌t̓k̓ʷ	x̌ʌ́t̓k̓ʷ .	*x̌át̓k̓ʷ	*design*
a'. x̌t̓k̓ʷ+[i]	x̌á . t̓ek̓ʷ .	*x̌ə́ . t̓ek̓ʷ .	*design's already there*
b. t̓ə́lk̓-t	t̓ə́l . k̓ət .	*t̓ál . k̓ət .	*make a hole*
b'. t̓lk̓+[i]	t̓á . lɪk̓ .	*t̓ə́ . lik̓ .	*a hole*
c. ʔsp̓	ʔə́sp̓ .	*ʔásp̓	*finish*
c'. ʔsp̓+[i]	ʔʌ́ . sɛp̓ .	*ʔə́ . sep̓ .	*it's finished*
d. ƛ̓ms=tan	ƛ̓ə́m . stən .	*ƛ̓ám . stən .	*village, community*
d'. ƛ̓ms+[i]	ƛ̓á . mɛs .	*ƛ̓ə́ . mes .	*where one resides*

Now compare the licit forms in (62.a-d) Column 2 with the ungrammatical examples in (62.a-d) Column 3. The contrast between these two sets of forms shows is that epenthesis is always minimal. Epenthesis of schwa (a bare NUC) satisfies the constraints which require that the Foot be properly headed whereas epenthesis of a full vowel (NUCμ) in this context produces less optimal Foot structure since an additional mora has been added. The ungrammatical forms in (62.a-d) are trimoraic rather than bimoraic. These forms constitute unmotivated violations of Foot Binarity and are therefore sub-optimal.

The full vowel (NUCμ) is realized as á [á ~ ʌ́] in the context of a uvular or glottalized consonant. Notice that the presence of a following labialized consonant takes precedence over a preceding glottalized consonant in determining the realization of the epenthetic full vowel, as shown by examples like (58.a').

Consider the following morphologically related words which also illustrate the ə ~ a alternation, but indicate that it is not necessarily restricted to the initial stressed syllable, as in (63.b-b').

(63)

	Input	Epenthesis	Output	Gloss
a.	mθq^{w}	m[ə́]θq^{w}	mʌ́θq^{w}	*torch*
a'.	mθiq^{w}	m[á]θiq^{w}	máθεq^{w}	*torch*
b.	DIM-mθq^{w}	mí-m[ə]θq^{w}	mé·mʌθq^{w}	*small torch*
b'.	DIM-mθq^{w}+[i]	mí-m[a]θiq^{w}	mé·maθεq^{w}	*small torch*

The diminutive forms in (63.b-b') make this look like a Weak Root; however, there are a small number of unaffixed Strong Roots which take a Ci- diminutive prefix as well. Additional research is required in order to determine the status of this Root.

4.4.2 Discussion and Proposed Analysis

Consider first an analysis of (63.a).

(64) mθq^w mə́θq^w *torch*

mθq^w μμ	FTBINμ	DEP[μ]	DEP[NUC]
☞ a. mə́$_{[Nuc]}$ θ$_μ$q$^w{}_μ$			*
b. má$_{[NUCμ]}$ θ$_μ$q$^w{}_μ$	*!	*	*

(65) mθ[i]q^w [máθεq^w] *torch*

mθq^{w}μμ+[i]μ	SYLL PROM FT	FTBINμ	DEP[μ]	DEP[NUC]	MAX[μ]
a. má$_{[Nucμ]}$. θε$_{<μ>}$q$^w{}_μ$			*	*	*
b. mə́$_{[Nuc]}$. θε$_{<μ>}$q$^w{}_μ$	*!	*		*	*
c. mə́$_{[Nuc]}$. θe$_μ$q$^w{}_μ$	*!			*	
d. m[í]θq^w μμμ		*!			
e. má$_{[Nucμ]}$. θe$_μ$q$^w{}_μ$	*!	*	*	*	

Candidate (65.d) requires further discussion. Although FTBINμ successfully rules out this candidate, it should also be noted that the expected position of the [i] infix is between the final two consonants of the Root, so that this candidate also represents non-minimal violation of the Alignment constraint which governs the position of this affix.

If FTBINμ dominates MAX[μ] and DEP[μ], then why are there CACC surface forms in Sliammon like those in (66)? In keeping with our present assumption regarding morafication which is that the full vowels and all coda consonants are moraic, forms like CACC where A is a full vowel appear to be trimoraic.

(66)

a. q^{w}anx̌	q^{w}a$_μ$n$_μ$x̌$_μ$	[q^{w}ánx̌]	*crab apple*
b. walθ	wa$_μ$l$_μ$θ$_μ$	[wálθ]	*bullfrog*
c. piwɬ	pi$_μ$w$_μ$ɬ$_μ$	[péwɬ]	*rendered fat, lard*
d. qawθ	qa$_μ$w$_μ$θ$_μ$	[qáwθ]	*potato, potatoes*

Notice that these forms are all mono-morphemic Roots. If the constraints on Root Faithfulness (ROOT FAITH: MAX ROOT, DEP ROOT) outrank Foot Binarity (FTBINμ) and the context free constraints DEP[μ] and MAX[μ], then it will be more important to keep lexically specified Root material, violating FTBINμ in order to satisfy the higher-ranking constraint on ROOT FAITH. Consider the tableau in (67) which shows how this works.

(67)

qʷanx̌ μμμ	ROOT FAITH	FTBINμ	DEP[μ]	MAX[μ]
a. qʷánx̌ (μμμ)		*		
b. qʷə́nx̌ (<aμ>μμ)	*!			*

Forms like those in (68) provide evidence for a different analysis: (CVμ . CCμ)

(68)

a. ǰanxʷ [ǰɛ́nxʷ ~ ǰɛ́nw̥] *fish, any fish*

The reader is referred to §3.2.2.3.1 and the discussion of minor syllables in Sliammon.

4.4.3 Implications of Strengthening of Weak Roots for Vowel Ablaut

It is proposed here that many of the Weak Roots which show schwa/full vowel alternations are phonologically conditioned. Schwa surfaces in a closed syllable (under primary stress) whereas a full vowel surfaces in an open syllable.

Watanabe (2000) maintains that the full vowel allomorph is associated with plural forms. The situation is complicated by a number of factors and appears to require further research. Representative data are cited in (69) from Watanabe (2000).

(69) Watanabe (2000)

a. x̌əƛ̓ *It (a string-like object) breaks* (HW 2000: 290)

a'. x̌aƛ̓-aw *They (string-like objects) break*

b.	pəx̌	*It got ripped*	(HW 2000)
b'.	pax̌-aw	*It ripped all apart*	
c.	x^wət̓m-a-t $t^θ$əm	*I will drop it*	(HW 2000: 291)
c'.	x^wat̓im-a-t $t^θ$əm	*I will drop them*	
d.	q̓ətx^w-a-t-as	*He burned it*	(HW 2000: 292)
d'.	q̓atix^w-a-t-as	*He burned them*	

Note that all of the forms cited by Watanabe are compatible with the analysis proposed here, namely the full vowel [a] surfaces where there would otherwise be a stressed schwa in an open syllable. Many of the cases of 'plurality' cited by Watanabe (2000:287-296) involve a plural object interpretation. Third person objects in Sliammon are not generally marked overtly on the predicate, and do not generally show morphological marking which distinguishes plural objects from singular objects. Therefore, in order to argue that a particular vowel quality indicates the 'plural', it seems necessary to show that these forms not only occur with an overt plural object NP but that they cannot occur with an overt singular object NP. It is the elicitation of these pairs of grammatical and ungrammatical examples which is required in order for the argument to go through. Neither Watanabe nor I (unfortunately) have the requisite data to test this. Notice too that (69.a'-b') take the plural marker /-’Vg/ -aw, so that the source of the plural interpretation is probably due to the presence of the plural marker rather than to the vowel quality of the Root.

The proposal advanced here is that the appearance of the full vowel instead of schwa is phonologically conditioned, as argued in §4.3.4. This is not intended to exclude genuine cases of morphologically or lexically-conditioned vowel ablaut, rather to point out that there are schwa/full vowel alternations which are sensitive to the prosodic structure of the language, and need not be marked specially in the lexicon (cf. Kinkade (1997) on Upper Chehalis for a similar conclusion).

4.4.4 Further Theoretical Implications

The Nuclear Moraic Model (Shaw 1993 et seq.) adopted here shows the incremental relationships between schwa, full vowels and long vowels, as in (70). It also predicts the fact that long schwa [əː] does not exist. Weight by definition is determined by the moraic count of the segments involved and their relative position within the syllable. Schwa is strengthened to a full vowel, as argued in §4.4 whereas full vowels are strengthened to yield a surface long vowel [V:].

(70) Schwa is weightless (cf. Nuclear Moraic Model Shaw 1993 et seq. and §3.0)

<table>
<tr><th>Schwa
weightless</th><th>Full Vowel
mono-moraic</th><th>Long Vowel
bi-moraic</th></tr>
<tr><td>Nuc
'
'
'
[ə]</td><td>Nuc
|
μ
|
[αf]</td><td>Nuc
/\
μ μ
\/
[αf]</td></tr>
</table>

The model therefore provides a unified account of strengthening and reduction by stating that strengthening involves the addition of a mora whereas weakening (reduction) involves deletion of a mora - the prosodic unit which characterizes phonological weight, as in (71). Kinkade (1997) makes essentially the same point for Upper Chehalis.

(71)

a.	Vowel Reduction	delete [μ]	MAX[μ]	§4.3
b.	Vowel Strengthening	add [μ]	DEP[μ]	§4.4

If we were to adopt a model in which schwa and the full vowels /i, u, a/ have the same prosodic representation; in particular, all vowels [i, u, a, ə] are uniformly moraic, as in (72), then how would we characterize the special behaviour of schwa in Sliammon?

(72) Uniform Model of Vocalic Weight

<table>
<tr><td>σ
/ \
μ μ
| |
C ə C</td><td>σ
/ \
μ μ
| |
C V C</td></tr>
</table>

Given the model in (72), the property which typically characterizes schwa is its lack of phonological features. Let's see how this model would account for the observed behaviour of schwa. Why is stressed schwa in an open syllable avoided? One would need to claim that schwa requires a coda consonant to close the syllable in order to provide features for schwa - a kind of licensing mechanism (cf. Blake 1992). Schwa needs to enter into a feature-sharing relation in order to be licensed.

Another question which arises with the model in (72) is what prevents long schwa? If schwa is moraic then why aren't there long schwas just like there are long vowels? A logical argument here would be that it is derived from the fact that schwa has no features - since it has no features, there is nothing to spread. However, if schwa and the full vowels both have the same prosodic representation, then why is schwa epenthesized into a closed syllable whereas the full vowels [i, u, a] are epenthesized into an open syllable? Again this would be related to the featureless status of schwa - epenthesis of a full vowel entails both insertion of a mora and the feature(s) association with that vowel - epenthesis of schwa is therefore less costly since if schwa is featureless it does not incur any *[f] violations.

Within the Nuclear moraic model, schwa in a stressed open syllable is dispreferred since it consists of a syllable which lacks phonological weight (see detailed discussion in Chapter 5). Within the model in (72), one would have to say that schwa in an open syllable is not licensed again by its failure to acquire phonological features from a tautosyllabic consonant to its right. This implies that schwa only gets features from the consonant which follows it and not from the consonant which precedes it. To some extent, we have seen that consonants which precede vowels do exert less effect on them than the consonants which follow them, but if we consider rounding of schwa in the environment of a labialized consonant, the labialized consonant may either precede or follow schwa (cf. §2.4).

Given a model in which schwa and the full vowels are both moraic, we need to ask how to characterize Full Vowel Reduction? Full vowel reduction to schwa would have to be characterized as the loss of features associated with the full vowel. Then we need to ask, why would a full vowel lose its features in an unstressed syllable? One would need to give an explanation of the following kind: the articulatory target is not fully realized in unstressed syllables. Although the tongue is heading towards the production of [a], it falls short of this articulatory target in post-tonic position, and is realized as [ʌ]. This approach entails the loss of phonological features but no change to the prosodic structure of the reduced full vowel. This approach would have trouble explaining the lack of identity between the realization of schwa and the laxed variants of full vowels since it claims that they should be identical.

I have just sketched an alternative type of analysis to the one presented here but I do not find the motivation as compelling as the model and proposal which is argued for here.

In particular, schwa is different from a full vowel in two ways - lack of phonological weight ***and*** lack of vowel features. As argued in Chapter 2, one of the basic observations regarding schwa (and the variants of schwa) in Sliammon is that there is a weight contrast between the full vowels i, u, a and schwa. Schwa is perceptibly briefer in duration. This weight contrast is derived in a straight forward manner within the Nuclear Moraic Model since schwa is non-moraic whereas full vowels are moraic.

4.5 Non-alternating Schwas

There are some examples of what I will call "non-alternating" schwas in the language (cf. van Oostendorp (1999) on "stable" schwa). One example involves the various forms of the clitics used to express the Future tense in Sliammon, as illustrated in (73). The first person singular and plural, and second person singular forms appear to have resulted from the fusion of the future clitic /sm/ with the preceding subject clitics to yield t^{θ}əm, štəm and čx^{w}əm respectively. The second person singular and first person plural subject clitics are čx^{w} and št , whereas t^{θ} is the form of the first person possessive marker. The second person plural involves the subject clitic čap 'you (pl)' followed by the future marker səm. The third person forms are uniformly səm. The form səm is expected in intransitive clauses where the 3rd person subject is unmarked, a point also made by Watanabe (2000: 45-47).

(73) Future

a.	1sg subject + future	t$^{\theta}$əm[4]	I will	
b.	2sg subject + future	čx^{w}əm	You (sg) will	
c.	3rd subject future	səm	S/he will	
d.	1pl subject + future	štəm	We will	(with CəC$_{PL}$ RED of predicate)
e.	2pl subject future	čɛp səm	You (pl) will	(with CəC$_{PL}$ RED of predicate)
f.	3rd pl subject future	səm	They will ...	(with -'Vg plural suffix)

Consider the following data which exemplifies the Future Paradigm. The subject plus future clitics are underlined.

(74)

	Input	**Output**	**Gloss**
a.	tan t$^{\theta}$ m	tán <u>t$^{\theta}$əm</u>	*I will be a mother*
b.	tan čx^{w} m	tán <u>čx^{w}əm</u> ~ tán čx^{w}ʊm	*You (sg) will be a mother*
c.	tan sm	tán <u>səm</u>	*She will be a mother*
d.	CəC$_{PL}$-tan št m	tə́ntan <u>štəm</u>	*We will be mothers*
e.	CəC$_{PL}$-tan čap sm	tə́ntan <u>čɛ̌p</u> <u>səm</u>	*You (pl) will be mothers*
f.	tan-'Vg sm	táʔnaw <u>səm</u>	*They will be mothers*

Notice that the first and second person plural forms are accompanied by CəC$_{PL}$- reduplication of predicate, and that the 3rd person plural 'they' involves the -'Vg plural suffix.

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[4]I have also documented some examples which take <u>čan səm</u> and <u>čən səm</u> in the Future. Relevant examples include: /ǰq̓-t čan sm/ [ǰʌ́q̓ čɛn səm] 'I will smooth it; I will sand it (with sandpaper)'; /tq-t čən sm tə ʔimin/ [tʌ́q čɩn səm t^{ə} ʔɛ́mɩn] 'I will close the door'; /ǰƛ̓ čan sm/ [ǰɩ́ƛ̓ čɛ̀n səm] 'I'm gonna go run'. Many of the examples which I have recorded involve Weak Roots of the form CəC; in addition, quite a number also involve transitive sentences with inanimate 3rd person objects. This construction is also documented in Blake (1996, 1997), as in /q^{w}ɩ̓ čn sm ʔiɬtan k^{w} masiq̓^{w}/ [q^{w}ʌ́ɩ̓ čən səm ʔɛ́ɬtʌn k^{w}ə mʌ́sɛq̓^{w}] 'I'm gonna come over and eat sea urchin.' Further research is required in order to determine the distribution of t$^{\theta}$əm versus čan səm/čən səm.

The point which is central to the discussion at hand is the distribution of schwa in these forms. The schwa which occurs after the subject does not alternate with "zero": it is always present in the surface form, as shown in (74.a-f). Even though there is no evidence for schwa/zero alternations, it is here claimed that these schwas are epenthetic in the environment before the resonant -m. Note that epenthesis of schwa [ə] before a resonant is predictable (cf. Matthewson 1994 on St̓át̓imcets, and Kinkade 1998 on Upper Chehalis, for example)[5]. The lack of surface alternations is attributed to the position of these clitics within the morpho-syntax. These elements occur within the clitic group and occupy the second position within the sentence. They follow the predicate complex when it occurs in word-initial position. As clitics, they are outside of the domain of the word-formation processes such as reduplication and suffixation, contexts in which schwa/zero alternations are well-attested.

4.6 Summary

This chapter has presented evidence for different kinds of alternations involving schwa. It is claimed here that schwa in Sliammon is basically an epenthetic prosodic position; namely, a bare nucleus [NUC] which is inserted in order to satisfy constraints on prosodic structure in the language - foot structure and Proper Headedness in particular, following research by Shaw (1993 et seq.) on other related Salish languages. Since schwa is a bare [NUC], we can derive that fact that schwa is also featureless, as argued in Chapter 2.

Excrescent schwas discussed in §4.1 are claimed to be transitional vowels which are the result of co-articulatory effects and are not phonologically active. In contrast, epenthetic schwa occurs in stressed closed syllables, as argued in §4.2. A reduced full vowel, is claimed to have the prosodic structure of schwa and the featural representation of a full vowel, and is claimed to arise from the loss of a mora in an unstressed closed syllable §4.3. Not only are full vowels reduced to

[5] Schwa epenthesis is often not recorded in Sliammon with the instrumental LS =tn. The resonant n is often syllabic after the homorganic stop t, as in táptn̩ *corset* and q̓át̓ᶿtn̩ *hair grease, hair oil.*

prosodic schwa, but some Weak Roots show schwa/full vowel alternations in which schwa [NUC] is strengthened to an epenthetic full vowel. In these cases, the surface vowel has the prosodic representation of a full vowel but the melodic structure typically associated with schwa; it is featureless (§4.4). Since schwa is claimed to be non-moraic, following the basic hypothesis of the Nuclear Moraic Model (Shaw 1993 et. seq.), we can also derive the fact that there are no long schwas.

It should also be noted that the patterns presented here for Sliammon schwa are strikingly similar to those documented by Kinkade (1997) for Upper Chehalis. This is of significant interest since Sliammon and Upper Chehalis are related Salishan languages which belong to different branches of the language family and are separated geographically from one another (located at extremes of area occupied by the language family).

4.7 Summary of OT Constraints

4.7.1 Constraints

(75) Faithfulness Constraints

Constraint	Effect
DEP[NUC]	Prohibits insertion of an empty Nucleus (NUC)
DEP[μ]	Prohibits insertion of a mora
MAX [μ]	Prohibits deletion of a mora
ROOT FAITH	Faithfulness (MAX and DEP) constraints relativized to Root

(76) Syllable Structure

Constraint	Effect
*COMPLEX ONSET	Syllables do not have complex onsets
*ə́]σ	Schwa does not occur in a stressed open syllable

(77) Prosodic Constraints

Constraint	Effect
ALIGN L PRWD-TO-STEM	The PrWd is aligned with the left-edge of the stem
PROPHEAD PW	A Prosodic Word is headed by a Foot
PROPHEAD FT	A Foot is headed by a syllable
PROPHEAD σ	A syllable is headed by a NUC [=SYLL NUC]
STRESS-TO-WEIGHT	A stressed syllable prefers to be heavy (i.e. bimoraic)
SYLL PROM FT	The weight of the stressed SYLL $\geq$ weight of the unstressed SYLL
FTBINμ	Feet are bimoraic
FTBINσ	Feet are bisyllabic
*CLASH	Avoidance of adjacent heads of feet: *($\acute{\sigma}$)($\grave{\sigma}$)

(78) Contiguity

Constraint	Effect
O-CONTIG ROOT	Insertion (DEP) into a Root disrupts adjacency relations (CONTIG)

4.7.2 Effects of Constraint rankings

(79)

Partial Ranking	Effects
*CLASH >> DEP[NUC]	epenthesis of schwa in order to avoid adjacent Heads of Feet
*CONSET >> DEP[NUC]	epenthesis of schwa avoids a Complex Onset violation
PROPHEAD >> DEP[NUC]	epenthesis of schwa ensures that each PrWd is headed by a V NUC
ALIGN L >> DEP[NUC]	schwa inserted so that Head of PrWd is aligned with left-edge of stem
FTBIN[μ] >> MAX[μ]	A mora is deleted in order to satisfy FOOT BINARITY [μ]
S-TO-W >> FTBIN[μ]	more important to have heavy head than satisfy FTBIN[μ]
PEAKPROM FT >> MAX[μ]	deletion of a mora from non-head, so that weight of the stressed Syll is greater than or equal to the weight of the non-head (unstressed) Syll.
FTBINμ >> DEP[μ], DEP[NUC]	epenthesis of [NUCμ] in order to make sure that Feet are bimoraic
ROOT FAITH >> FTBIN[μ]	more important to have Root I/O correspondence than satisfy FTBIN[μ]

Chapter 5:

Constraints on the Distribution of Schwa

Raven has all the girls he needs.
He's got machismo and charisma.
He sings Cole Porter songs in the shower
and thinks he's James Cagney.
When he's dry he plays the piano
choosing a Chopin nocturne, so touching.

Phyllis Webb

Stressed schwa "tends to occur only in closed syllables in Salish languages."

Kinkade (1997: 206), citing Patricia A. Shaw (p.c.)

5.0 Introduction

As we saw in the last chapter, schwa is epenthesized in order to satisfy Proper Headedness; it also prevents violation of *Complex Onset. Although schwa is epenthesized under pressure from higher-ranked constraints, there are also conflicting constraints on the contexts in which schwa can occur. This chapter brings together a range of seemingly unrelated data and aims to show that an explanation for the range of observed allomorphy is due to the constraint which bans stressed schwa in an open syllable, informally $*\acute{ə}]_\sigma$, and its interaction with other constraints. Although schwa does occur in a stressed open syllable in a limited number of cases, as shown in §5.7, there are also phonological constraints operative in Sliammon which militate against this configuration. This is a classic case of constraint conflict; a formal analysis will be presented within a correspondence version of Optimality Theory.

In this chapter, it is observed that the main strategy used in order to avoid a stressed schwa in an open syllable in Sliammon is to close the syllable with a moraic coda consonant: $C\acute{ə}C_\mu$. The range of examples which will be discussed in this chapter are summarized in (1).

(1) *ə́]σ

	Input	*ə́]σ	Output	Section
a.	CəO'V	*Cə́ . O'V	Cə́ʔ . O'V	§5.1 Glottalized Obstruents
b.	CəR'V	*Cə́ . R'V	Cə́ʔ . RV	§5.2 Glottalized Resonants
c.	CəOV	*Cə́ . OV	CəO:V	§5.3 Gemination
d.	CəC=V	*Cə́ . C=V	CəC=[h]V	§5.4 [h]-epenthesis

What do these examples have in common? At first blush, there does not seem to be any reason to believe that the surface realization of glottalized obstruents and resonants is related to consonant gemination or h-epenthesis; however, the goal of this chapter is to show that these seemingly unrelated cases of surface allomorphy receive a single principled analysis which makes reference to the phonological constraints on syllabification and foot formation.

As argued in the previous chapter, Roots which have an initial consonant cluster require schwa epenthesis in order to satisfy Proper Headedness at the level of the Foot, as well as to satisfy the constraint which bans Complex Onsets in the language. In each optimal output candidate in (1), the second syllable satisfies the Onset constraint while the first syllable satisfies the constraint which bans schwa in a stressed open syllable. Simultaneous satisfaction of both constraints is achieved by associating some of the features of C_2 with the coda of the first syllable, and the remaining features with the Onset of the second syllable, as will be shown in detail in §5.1-5.4.

The remainder of this chapter is organized as follows: §5.1-5.2 discuss the surface realization of glottalized consonants in the language; in particular, the fact that the laryngeal constriction can be sequenced independently of the oral closure and release. The relative timing of the oral and laryngeal gestures makes it possible to satisfy both constraints. In addition, presence of the coda consonant following stressed schwa implies that there is conservation of underlying moraic contrasts and ensures that the weight of the head of the Foot is greater than or equal to the weight of the non-head. §5.3 discusses gemination of an intervocalic consonant whereas §5.4 shows that some unexpected cases of h-epenthesis follow from the ranking of *ə́]$_{\sigma}$. §5.5 explores the implications of the proposed analysis for Imperfective reduplication. §5.7 discusses a number of cases in which schwa does occur in a stressed open syllable, providing evidence that the constraint *ə́]$_\sigma$ is itself violable, and must be ranked below the constraint which aligns primary stress with the left-edge of the Prosodic Word (PrWd). The final section §5.8 discusses the formalization of the constraint *ə́]$_\sigma$.

5.1 Surface realization of Glottalized Obstruents

The first case which is considered involves the surface realization of glottalized obstruents.

5.1.1 The Problem

Glottalized obstruents (stops and affricates: p̓, t̓ᶿ, t̓, ƛ̓, č̓, k̓, k̓ʷ, q̓, q̓ʷ) are weakly ejective, as initially noted by J.Davis (1970), and are generally realized with the glottal release following the obstruent. Data conforming to these generalizations are given in (2).

(2)

	Input		Output	Gloss
a.	p̓s	p̓əs	p̓ʌ́s	*numb*
a'.	p̓s=iqʷan	p̓əs:iqʷan	p̓ʌ́s:ɛqʷʌn	*numb head, can't think*
b.	ɬup̓=us-t ga	ɬup̓ust ga	ɬóp̓ɔstʰ gʌ	*peel it!*
c.	x̌ap̓	x̌ap̓	x̌áp̓	*cradle basket*
d.	t̓ᶿit̓ᶿit̓	t̓ᶿit̓ᶿit̓	t̓ᶿé·t̓ᶿɩt̓	*narrow*
e.	t̓ᶿut̓ᶿk̓ʷum̓	t̓ᶿut̓ᶿk̓ʷum̓	t̓ᶿót̓ᶿk̓ʷɔ̀m̓	*half-smoked fish*
f.	t̓in	t̓in	t̓ɛ́n	*barbecued salmon*
g.	t̓upit	t̓upit	t̓ó·pɩtʰ	*sun-dried fish (cod)*
h.	t̓at̓miʔim+[cgl]	t̓at̓miʔim̓	t̓át̓meʔɩm̓	*gambling, bingo*
i.	ƛ̓um	ƛ̓um	ƛ̓óm	*enough*
j.	IMP-ƛ̓uɬ	ƛ̓u-ƛ̓uɬ	ƛ̓óƛ̓ɔɬ	*s/he is growing*
k.	ƛ̓ax̌=ay	ƛ̓ax̌ay	ƛ̓áx̌ʌy	*elder, old person*
l.	IMP-ƛ̓qiɬ	ƛ̓ə-ƛ̓qiɬ	ƛ̓ʌ́ƛ̓qɛɬ	*giving birth*
m.	č̓lq̓-t	č̓əlq̓ət	č̓ɩ́lq̓ʌtʰ	*sign one's name*

n.	č̓x̌	č̓əx̌	č̓ʌ́x̌	*ripe, done, cooked*
o.	nač̓	nač̓	náč̓	*different*
o'.	na-nač̓	nanač̓	nánʌč̓	*wrong*
p.	k̓ilθ+[i]	k̓il[i]θ	k̓élɩθ	*crooked*
q.	k̓ik̓ik̓	k̓ik̓ik̓	k̓ík̓ɩk̓ ~ k̓ík̓ɛk̓	*crow*
r.	t̓lk̓+[i]	t̓əl[i]k̓	t̓ə́lɩk̓ ~ t̓ə́lɛk̓	*a hole*
s.	k̓ʷun̓ut̓	k̓ʷuʔnut̓	k̓ʷúʔnɔt̓	*porpoise*
t.	k̓ʷuʔuxʷ	k̓ʷuʔuxʷ	k̓ʷúʔʊxʷ ~ k̓ʷóʔʊxʷ	*smoked fish*
u.	ɬak̓ʷ	ɬak̓ʷ	ɬák̓ʷ	*swell up*
v.	q̓is-t	q̓isət	q̓ɛ́sɛtʰ	*tie it*
w.	q̓is-ʔm	q̓isʔəm	q̓ɛ́sʔʌm	*tie (s.t.)*
x.	p̓iq̓	p̓iq̓	p̓ɛ́q̓	*wide*
y.	mq̓	məq̓	mʌ́q̓	*full (from eating)*
z.	q̓ʷit	q̓ʷit	q̓ʷɛ́t	*beach*

In a certain limited set of cases, glottalized obstruents involve restructuring of the glottal portion of the ejective so that glottal closure precedes the obstruent, but with the apparent retention of the laryngealization associated with the obstruent, following Kroeber (1989), Blake (1995, 1998, 1999), Urbanczyk (1999.a on Klahoose), as shown by the data in (3.a-g).

(3)

	Input	**ʔ in coda**	**Output**	**Gloss**
a.	t̓q̓ʷa	t̓ə́ʔ . q̓ʷa	t̓áʔq̓ʷa ~ t̓áʔq̓ʷʌ	*devil fish, octopus*
b.	ǰk̓ʷ=us-m	ǰə́ʔ . k̓ʷusəm	ǰɛ́ʔk̓ʷusəm	*paint one's face*
c.	ǰƛ̓ a čxʷəm	ǰə́ʔ . ƛ̓ačxʷəm	ǰɛ́ʔƛ̓ačxʷʊm	*Are you going to run?*
d.	t̓ᶿč̓-INC-NTr-an	t̓ᶿə́ʔ . č̓ač̓uxʷan	t̓ᶿáʔč̓ɛč̓ùxʷʌn	*I made it bitter*
e.	p̓q̓=aya	p̓ə́ʔ . q̓aya	p̓áʔq̓ayɛ	*chimney, stove pipe*
f.	q̓t̓-m	q̓ə́ʔ . t̓əm	q̓áʔt̓əm	*heavy*
g.	p̓t̓ᶿt	p̓ə́ʔ . t̓ᶿt	p̓áʔt̓ᶿt	*tin can*

For each of the forms cited in (3), the morphologically related forms in (4) show that it is truly a glottalized obstruent (O'), and not a /ʔ/ which is the second consonant of the Root.

(4)

	Input		Output	Gloss
a.	DIM-t̓q̓ʷa	t̓i-t̓əʔq̓ʷa	t̓ít̓aʔq̓ʷʌ	*small octopus*
b.	ǰk̓ʷ-ʔm	ǰə́k̓ʷʔəm	ǰʊ́k̓ʷʔʌm	*paint (s.t.)*
b'.	ǰk̓ʷ-t	ǰə́k̓ʷt	ǰʊ́k̓ʷtʰ	*rub it*
c.	ǰƛ̓	ǰə́ƛ̓	ǰɪ́ƛ̓	*run*
c'.	CəC$_{PL}$-ǰƛ̓ tᶿəm	ǰə́ƛ̓ǰəƛ̓ tᶿəm	ǰɪ́ƛ̓ᵊǰɪƛ̓ tᶿəm	*I'll go running*
d.	tᶿč̓	tᶿəč̓	tᶿɪ́č̓	*bitter*
e.	p̓q̓	p̓əq̓	p̓ʌ́q̓	*smoke*
f.	q̓t̓-m-ʔm=min	q̓ət̓maʔamin	q̓ʌ́t̓maʔʌmɪn	*sinker (fishing line)*
g.	CəCPL-p̓t̓ᶿt	p̓ət̓ᶿ-p̓əʔt̓ᶿt	p̓ə́t̓ᶿp̓aʔt̓ᶿtʰ	*lots of tin cans*
g'.	DIM-p̓t̓ᶿt-[i]	p̓i-p̓əʔt̓ᶿ[i]t	p̓ép̓aʔt̓ᶿɪtʰ	*small tin can*

The problem then is to determine in what context(s) glottalized obstruents are post-glottalized as in (2) and (4), and in what contexts the glottal constriction also precedes the obstruent (ʔO'), as in (3).

The data in (5.a-l) below provide evidence that glottalized obstruents are realized as post-glottalized following any consonant or full vowel. Further, a surface form with a preceding glottal closure was systematically rejected, as shown by the ungrammatical forms in (5.a-l) Column 3.

(5)

	Input	Output	*ʔO'	Gloss
a.	pu-pt̓ᶿ=ayin	pópt̓ᶿayɛn	*pópʔt̓ᶿayɛn	*uneven, crooked shape*
b.	tᶿi-t̓ᶿp̓=ayin̓	tᶿít̓ᶿp̓àyɪnʔn	*tᶿít̓ᶿʔp̓ayɪnʔn	*triangle*
c.	CH-t̓ᶿamqʷ=ayəm	t̓ᶿámt̓ᶿamqʷʌ̀yɪm	*t̓ᶿámʔt̓ᶿamqʷʌ̀yəm	*foggy*

d. qmk̓ʷ-'uɬ a čxʷ	qʌ́mk̓ʷoɬæ̀čxʷ	*qʌ́mʔk̓ʷoɬæ̀čxʷ	*Did you tip over?*
e. xʷa-xʷalp̓aliʔ	xʷáxʷʌlp̓àlɛʔ	*xʷáxʷʌlʔp̓àlɛʔ	*see-saw (playground)*
f. IMP-t̓an̓aɬ	t̓át̓aʔᵊnʌɬ	*t̓áʔt̓aʔnʌɬ	*playing with rag dolls*
g. DIM-ƛ̓t̓x̌+[i]	ƛ̓áƛ̓at̓ɛx̌ ~ ƛ̓áƛ̓ʌt̓ɛx̌	*ƛ̓áʔƛ̓at̓ɛx̌	*grasshopper*
h. č̓ač̓amiqʷ	č̓ɛ́č̓ɛmɛqʷ ~ č̓ɛ́č̓ameqʷ	*č̓ɛʔč̓ɛmɛqʷ	*great-grandmother*
i. nač̓-mut	náč̓ᵊmotʰ	*náʔč̓mot	*really different*
j. IMP-ɬut̓-t+[ʔ] č	ɬóɬot̓ʊ̀čʰ	*ɬóɬoʔt̓ʊč	*I'm inhaling it*
k. x̌it̓ᶿ	x̌ɛ́t̓ᶿ	*x̌ɛ́ʔt̓ᶿ	*iron (metal)*
l. IMP-ɬik̓ʷ-ʔəm+[ʔ]	ɬíɬek̓ʷəm̓	*ɬíɬeʔk̓ʷəm̓	*sewing (s.t.)*

Contrast this with the behaviour of the forms in (6.a-e), in which the glottalized obstruent is always preceded by a glottal closure [ʔO']. Notice that what these examples have in common is that they involve Weak Roots /CC/ [CəC]. The [ʔ] in the forms in (6) Column 2 functions as the coda to the initial syllable, and therefore satisfies the constraint against schwa in a stressed open syllable. Compare these examples with the ungrammatical forms in (6) Column 3, which violate this constraint. Since the Output candidates in Column 4 satisfy $*\acute{ə}]_\sigma$, and glottalized obstruents are not restricted in syllable-initial position, as shown in (2), no other changes between the Input and the Output take place. The Output forms show the effects of schwa colouration (C-V feature sharing), as discussed in §2.4.4.

(6)

Input	ʔ in coda	*ə́]σ	Output	Gloss
a. kt̓=iqʷ=uǰ̓a	kə́ʔ . t̓iqʷuʔǰa	*kʸə́ . t̓ɛqʷòʔǰɛ	kʸɛ́ʔ.t̓ɛqʷòʔǰɛ	*pinky (finger)*
b. x̌ʷƛ̓=igan	x̌ʷə́ʔ . ƛ̓igan	*x̌ʷə́ . ƛ̓egən	x̌ʷáʔ.ƛ̓egən	*half full*
c. gq̓=iʔpan	gə́ʔ . q̓iʔpan	*gə́ . q̓ɛ:pʌn	gʌ́ʔ.q̓ɛ:pʌn	*it has no lid*
d. θt̓ᶿ-m	θə́ʔ . t̓ᶿəm	*θə́ . t̓ᶿəm	θáʔ.t̓ᶿəm	*jig for cod*
e. q̓t̓-m	q̓ə́ʔ . t̓əm	*q̓ə́ . t̓əm	q̓áʔ.t̓əm	*heavy*

It should be noted that glottal restructuring also occurs with Roots/Stems which have an initial consonant cluster, and where the second consonant is a glottalized obstruent (O'), as shown by the forms in (7).

(7)

Input	**ʔ in coda**	***ə́]σ**	**Output**	**Gloss**
a. x̌ʷp̓an='ay	x̌ʷə́ʔ . p̓anʔay	*x̌ʷə́ . p̓anʔay	x̌ʷáʔᵊp̓ʌnʔə̀y	*Indian tea*
b. mt̓ᶿuɬ	mə́ʔ . t̓ᶿoɬ	*mə́ . t̓ᶿoɬ	mʌ́ʔt̓ᶿoɬ	*pus*

These Roots/Stems may involve suffixes which are no longer analyzable from a synchronic perspective, in which case, they could be grouped together with the Weak Roots in (6), or they may belong to the class of CCVC roots which are far fewer in number than other Root shapes (cf. Appendix V).

A comparison of the data in (8.a-h) Columns 2 and 3 shows that when schwa occurs in a syllable closed by an ejective obstruent, restructuring into a [ʔO'] sequence does not take place.

(8)

Input	**Output**	***Cə́ʔO'.C**	**Gloss**
a. IMP-ƛ̓p-INC	ƛ̓ə́ƛ̓ . pəp	*ƛ̓ə́ʔƛ̓ . pəp	*getting deeper*
b. IMP-č̓px̌-INC	č̓ə́č̓ . pəpx̌	*č̓ə́ʔč̓ . pəpx̌	*getting dirty*
c. p̓q̓	p̓ə́q̓	*p̓ə́ʔq̓	*smoke*
d. IMP-p̓q̓-INC	p̓ə́p̓ . q̓əq̓	*p̓ə́ʔp̓ . q̓əq̓	*getting smokey*
e. ƛ̓q̓	ƛ̓ə́q̓	*ƛ̓ə́ʔq̓	*rot*
f. IMP-ƛ̓q̓-INC	ƛ̓ə́ƛ̓ . q̓əq̓	*ƛ̓ə́ʔƛ̓ . q̓əq̓	*getting rotten*
g. ƛ̓č̓t	ƛ̓ə́č̓t	*ƛ̓ə́ʔč̓t	*sleep*
h. CH-gt̓ᶿ	gə́t̓ᶿgət̓ᶿ [gʎt̓ᶿᵊgʌt̓ᶿ]	*gə́ʔt̓ᶿgət̓ᶿ	*person who is a tease*

To summarize, the realization of /O'/ is in complementary distribution:

(9)

a. /O'/ → [ʔO'] / ə́ ___ V

b. /O'/ → [O'] / elsewhere

Kroeber (1989: 107) notes that "a number of instances of surface short ɑ are in fact produced from underlying ə", as shown in (10).

(10) ə → ɑʔ / #C___C'V

where C' is a glottalized stop or affricate, and #=word boundary

Notice that the formulation given by Kroeber includes the word boundary #, indicating that this set of properties hold at the left-edge of the word domain. Note however that primary stress is also strictly aligned with the left-edge of the word in Sliammon, as discussed by Davis (1970; cf. also §3.3). As argued in Blake (1995, 1999; cf. also Urbanczyk (1999.a), stress is the crucial condition, not the fact that these examples occur word-initially. That is, this restructuring of a glottalized obstruent into a ʔ-O' sequence captures a property of the syllable bearing primary stress (i.e. the head of the Prosodic Word).

§5.1.2 Proposed Analysis

The question which we need to ask here is why is schwa systematically avoided in stressed open syllables? Since optimal syllables have both a nucleus and phonological weight, it is better for schwa to occur in a stressed syllable closed by a moraic coda consonant Cə́Cμ than for schwa to occur in an open stressed syllable which has no moraic content. Furthermore, the syllable which is the head of the stress Foot needs to satisfy PEAK PROM FT, the constraint which ensures that the phonological weight of the stressed syllable is greater than or equal to the weight of the non-head (cf. Chapter 3).

Onset formation and faithfulness to underlying moraic structure are both satisfied if the laryngeal features of the glottalized obstruent occupy the coda of the first syllable while the obstruent occupies the Onset to the following syllable, as shown by the structure in (11).

(11) Input: t̓q̓ʷa   t̓ə́ʔμ . q̓ʷaμ   [t̓áʔq̓ʷa] *devil fish, octopus*

```
          s            w
          σ            σ
         /|\          /|
        / N \        / N
       /  |  μ      /  μ
      /   |   \    /   |
     t̓    ə    ʔ  q̓ʷ   a
```

Recall that schwa is systematically lowered to a brief [a] in the environment before ʔ (cf. (10) and Chapter 2). There is independent evidence from Compensatory Lengthening facts that glottals in coda position are moraic, as shown by the sets of alternations in (12). The forms in (12) Column 3 show that loss of a syllable-final glottal induces Compensatory Lengthening of the preceding vowel (cf. Blake 1992, and §3.1.1.1).

(12)

Input	**Vʔ coda**	**CLengthening**	**Output**	**Gloss**
a. xʷuǰum̓=aya	xʷúǰuʔmàya	xʷúǰu:màya	xʷúǰuʔmàyɛ	*store*
b. č̓ʔ=nač=tn	č̓áʔnačtən	č̓á:načtən	č̓ɛ́:nʌčtn̩	*cushion*
c. niʔ-'uɬ ʔm̓ut	níʔuɬ ʔáʔmʊt	----	nɛ́ʔoɬ ʔáʔmʊtʰ	*s/he was home*
c'. ʔm̓ut-'uɬ č	ʔəʔmutuɬ č	ʔá:mutùɬ č	ʔá:motòɬ č	*I was home*
d. təy̓ta	tíʔta	tí:ta	tíʔtʌ ~ tí:tʌ	*that one (gen.)*
e. θəy̓θa	θíʔθa	θí:θa	θíʔθʌ ~ θí:θʌ ~ ɛ́	*that one (fem.)*

The proposal here is that the [ʔ] is moraic, and therefore satisfies the constraint that syllables have phonological weight. The constraint is formalized as SYLL MORA , following Shaw (1996).

In summary, glottalized obstruents are generally post-glottalized [O’]. Glottalized obstruents are realized as [ʔO’] when they occur in intervocalic position following a stressed schwa. The output candidate satisfies the constraint which bans schwa in a stressed open syllable: $*ə́]_{\sigma}$. This particular approach extends to the analysis of the surface realization of glottalized resonants presented in the next section.

5.2 Surface realization of Glottalized Resonants

Reduplicative facts show that glottalized resonants pattern as unitary segments with respect to these morphophonological processes, and thus motivate the existence of underlying glottalized resonants. Harris (1981) for Island Comox, Davis (1978), Blake (1992, 1995) and Watanabe (1994) posit underlying glottalized resonants /R’/ in Sliammon, a position which entails that the surface distribution of glottalization associated with the resonant is entirely predictable.

5.2.1 Glottal Restructuring

In Sliammon, underlying glottalized resonants /R’/ often surface sequentially, as in (13-14). In (13.a-j) an intervocalic glottalized resonant surfaces as pre-glottalized: [ʔR].

(13) R’ → [ʔR]

	Input	**v́ʔ . Rv**	**Output**	**Gloss**
a.	t̓in̓iq^{w}	t̓íʔ . niq^{w}	t̓éʔnɛq^{wh}	*salmonberry*
b.	ƛ̓in̓a	ƛ̓íʔ . na	ƛ̓ɛ́ʔna ~ ƛ̓ɛ́ʔ^{ɛ}na	*oolichan oil*
c.	x̌^{w}il̓m	x̌^{w}íʔ . ləm	x̌^{w}ɛ́ʔ^{ə}lʌm	*rope*
d.	ʔal̓as	ʔáʔ . las	ʔáʔlʌs	*sea cucumber*
e.	p̓ay̓an	p̓áʔ . yan	p̓áʔ^{ə}yɩn ~ p̓áʔ^{ə}yɛn	*bark*
f.	q^{w}w̓iɬ	q^{w}ə́ʔ . wiɬ	q^{w}áʔwɩɬ ~ q^{w}áʔ^{a}wɩɬ	*pitch, gum*
g.	k^{w}w̓ič	k^{w}ə́ʔ . wič	k^{w}áʔwɩč	*sturgeon*
h.	sm̓a	sə́ʔ . ma	sáʔma	*blue mussel*
i.	qy̓a	qə́ʔ . ya	qáʔyɛ	*water*
j.	č̓m̓=uǰ̓a	č̓ə́ʔ . muʔ . ǰa	č̓éʔ^{ə}moʔǰɛ	*cold hands*

When a glottalized resonant occurs in word-final position, the output is variable. Blake (1992) most often records [Rʔ ~ R'], as in [čúyʔ ~ čúẏ] *child* or [pálʔ ~ pál̓] *heron, crane* , whereas Watanabe (1994:224) states that the "resonant is chopped off abruptly by the closure of the glottis, or the closure may occur somewhere in the middle of the resonant. In such cases, an echo of the resonant, often voiceless, is heard after the glottal closure is released, i.e. [mʔᵐ ~ ʔm] for example." Watanabe (1994) cites [tʌ́ʔm ~ tʌ́ʔᵐ] *belt* and [tə́nʔⁿ] *that one* as examples. In my own fieldnotes, the glottal portion most often follows the resonant (post-glottalized) in stressed monosyllables, as shown by the stressed forms in (14.a-f).

(14) /R'/ → [Rʔ ~ RʔR]

a.	tm̓	təm̓	tʌ́mʔm ~ tʌ́mʔ	*belt*
b.	qʷl̓	qʷəl̓	qʷə́lʔ ~ qʷʌ́lʔ	*come*
c.	tam kʷ šin̓	tam kʷ šin̓	tám kʷ šínʔ	*What was that?*
d.	pal̓	pal̓	pálʔ	*heron*
e.	čuẏ	čuẏ	čúyʔ	*child, young*
f.	tẉ	təẉ	túwʔʷ	*ice*

Contrast this with the realization of /R'/ in unstressed syllables in (15.a-d). These glottalized resonants tend to surface with creaky voice articulation, and seem to lack the distinctive full glottal closure [ʔR ~ RʔR ~ Rʔ] associated with the examples in (14) above.

(15) /R'/ → [R']

	Input		Output	Gloss
a.	hiyum̓	hiyum̓	héyum̓	*seagull*
b.	CəCPL-saẏǰa	səy-saẏǰa	sísaẏǰɛ	*leaves*
c.	qʷɬ=aẏ	qʷəɬaẏ	qʷə́ɬaẏ ~ qʷʊ́ɬaẏ	*driftwood*
d.	x̌aw̓s	x̌aw̓s	x̌áw̓s ~ x̌ʌ́w̓s	*new*

Blake (1992) argues that the prosodic position in the syllable plays an important role in determining the distribution of the glottal constriction with respect to the oral closure. Glottalized resonants are generally banned in non-moraic (syllable onset) position as evidenced by the lack of word-initial [R'] in the language. It is proposed here that this is encoded in the constraint *R'/Onset. The lack of absolute word-initial glottalized resonants follows from the fact that an initial glottalized resonant does not have access to a preceding syllable so that restructuring can not take place.

In word-internal intervocalic position, glottalized resonants are restructured as in (13) above, whereas glottalized resonants occur freely in moraic (coda) position either word-internally or word-finally. Blake (1995) makes two additional observations: (i) Foot structure (i.e. stress assignment) plays an important role in determining the surface realization of glottalized resonants, and to a lesser extent (ii) the features of the adjacent consonants and vowels also play a role. The surface realization of /R'/ is then governed by a number of different prosodic and melodic factors:

(16) (a) syllable structure
(b) foot structure
(c) melodic structure (features)

The patterns which are observed are as follows. Glottalized resonants (R') have a complete glottal closure and release [Rʔ] in the coda of a stressed word-final syllable (i.e. a monosyllable), as shown by the data in (14), whereas glottalized resonants are realized with creaky voice [R'] in unstressed codas, as shown by the data in (15). This is summarized in (17).

(17) Foot Structure and R'

(i) CVR' → [Cv́Rʔ] post-glottalized (full glottal closure) in the coda of a stressed syllable.

(ii) CVR' → [..CvR'] creaky voice (partial glottal closure) in the coda of an unstressed syllable.

In a metrically prominent position under primary stress one finds a maximal syllable whereas in a metrically weak position, one finds a non-maximal syllable with creaky voice articulation throughout the resonant rather than full glottal closure after.

(18)

(i) maximal [Cv́Rʔ] syllable in metrically prominant position (primary stress)

(ii) non-maximal [CvR'] syllable in metrically weak position

Consider another context in which glottalized resonants are realized sequentially: this is the case in which a Root-final glottalized resonant is followed by a vowel-initial Lexical Suffix. This word-internal, intervocalic glottalized resonant is restructured so that the glottal portion of the glottalized resonant remains in coda (moraic) position. The resonant portion functions as the Onset to the following syllable as illustrated by the data in (19.a-c), satisfying the high ranking constraint that all syllables in the language have an Onset. The ungrammatical forms in (19) Column 3 are ruled out by the constraint against [R'] in Onset position.

(19)

	Input	Output	*R'/Onset	Gloss
a.	q^{w}an̓=iq^{w}ɬa	q^{w}áʔ^{a} . nʊq^{w} . ɬa	*q^{w}á . n̓ʊq^{w} . ɬa	*knee*
b.	ɬan̓=uk^{w}	ɬáʔ^{a} . nʊk^{wh}	*ɬá . n̓ʊk^{wh}	*mountain goat skin*
c.	č̓m̓=uǰ̓a	č̓ɛ́ʔ^{ə}. moʔ . ǰɛ^{h}	*č̓ɛ́ . m̓oʔ . ǰɛ^{h}	*cold hands*

It is proposed here that glottalized resonants /R'/ are sets of phonological features which can be reconfigured in order to satisfy this constraint on metrical prominence, following Blake (1995, 1999). In particular, the proposal made here, in keeping with Blake (1992), is that the coda ʔ continues to occupy the mora associated with the second consonant of the Root and therefore satisfies Faithfulness of the underlying moraic structure. By retaining the underlying moraic structure, the phonological weight of the stressed syllable is also enhanced. All other features of the Resonant are parsed into the Onset position.

Consider the following examples in (20) which show this deconstruction of /R'/ has the consequence that stressed schwa surfaces in a closed syllable, and therefore satisfies the constraint: $*\acute{ə}]_{\sigma}$. Since /ǰ, ǰ̓, g, g̓/ function as resonants (i.e. they pattern with the resonants in processes involving resonant glottalization), I have included examples with /ǰ̓, g̓/ here in addition to /m̓, n̓, y̓/. See Blake (1992, 1995) for argumentation regarding the Resonant status of /ǰ, ǰ̓, g, g̓/.

(20) C_2 is a glottalized resonant

Input	**Output**	***Cə́ and *R'/Onset**	**Gloss**
a. p̓m̓a	p̓áʔᵊma	*p̓ə́ . m̓a	*wooden float*
b. šm̓-it	šέʔᵊmɛtʰ	*šə́ . m̓ɛt	*dried*
c. tm̓=us-tn	táʔᵊmòstn̩	*tə́ . m̓òstn̩	*headband*
c'. tm̓=iws-tn	táʔmewstən	*tə́ . m̓ewstən	*garter (stockings)*
c''. tm̓=igan-tn	táʔmegàtn̩	*tə́ . m̓egàtn̩	*tied round waist*
d. kʷn̓ay	kʷáʔᵊnʌy	*kʷə́ . n̓ʌy	*cover, lid*
e. θy̓-m	θáʔᵊyɨm	*θə́ . y̓əm	*to sink*
f. ʔǰ̓-m=uǰ̓a	ʔàʔǰɛmóʔǰɛ	*ʔə̀ . ǰ̓ɛ . móʔ . ǰɛ	*right hand*
g. ɬg̓=itᶿa-m ga	ɬáʔᵃg̓ìtᶿəm ga	*ɬə́ . g̓ìtᶿəm ga	*take it off!*
h. q̓g̓a	q̓áʔga	*q̓ə́ . g̓a	*walking stick*

Compare the Output in (20) Column 2 with the unattested forms in (20) Column 3. The surface forms involve (i) schwa epenthesis, (ii) the restructuring of the glottalized resonant [ʔR] with loss of laryngealization on R, and (iii) lowering of schwa to [a] before the glottal. The surface forms in Column 2 *avoid* violations of at least two constraints in the language: (a) the constraint which bans schwa in a stressed open syllable, and (b) the constraint against glottalized resonants in syllable onset (non-moraic) position, as in (21).

(21)

a.	$*\acute{ə}]_{\sigma}$	Schwa does not occur in a stressed open syllable
b.	*R'/Onset	Glottalized resonants do not occur in syllable Onset (non-moraic) position

Contrast this with the ungrammatical forms in (20) Column 3 which violate both of these constraints. Since the output candidates satisfy both $*\acute{ə}]_{\sigma}$ and *R'/Onset, one would not expect to find surface forms of the shape: [Cáʔ'R'V ...] since this would still violate *R'/Onset. Examples like [CáR'. V] are also ruled out by high-ranking constraint which ensures that all syllables have Onsets in Sliammon, as argued in Chapter 3.

5.2.2 Proposed Analysis

Formalization of the analysis sketched in the preceding section is developed below, and refers to the constraints presented in (21-22).

(22)

ONSET	Syllables have onsets.
PEAK PROM FT	Within a Foot, the weight of the stressed syllable (i.e. the Head) is greater than or equal to the weight of the unstressed syllable.
NO CODA	Syllables are not closed by a Coda (i.e. a non-Nuclear mora).

Consider the tableau in (23) which shows how the proposed constraint ranking predicts the surface form in (23.a) and rules out the candidates in (23.b-c). This is a partial constraint ranking which assumes that schwa occurs in the optimal position (cf. §Chapter 3-4), and does not deal with deriving the effects of schwa colouration; in particular, the lowering of schwa to [ɑ] before ʔ (cf. §2.4.4).

(23) p̓m̓a p̓ə́ʔ.ma [p̓áʔma] *wooden float*

Input: p̓m̓a μμμ	ONSET	SYLL PROM	*R'/ONSET	$*\acute{ə}]\sigma$	NO CODA
☞ a. p̓ə́ʔ . ma μ . μ					*
b. p̓ə́ . m̓a -- . μ		*!	*	*	
c. p̓ə́m̓ . a μ . μ	*!				*

The optimal candidate in (23.a) satisfies the top-ranking constraints at the cost of incurring a NO CODA violation. Candidate (23.b) violates a number of these constraints since schwa occurs in an open stressed syllable, and a glottalized resonant occurs in Onset position. In addition, the phonological weight of the head of the Foot is less than the weight of the non-head. This incurs a SYLL PROM violation. Candidate (23.c) violates the high-ranking constraint which ensures that all syllables have onsets in Sliammon.

One question worth exploring is why is the glottalized resonant systematically realized as [ʔ . R] rather than [R . ʔ] ? That is, what rules out a candidate like [p̓ə́m . ʔa], and makes it less optimal than candidate (23.a) p̓ə́ʔ . ma ?

5.3 Geminate Consonants

The next section discusses syllabification of a single intervocalic consonant with the observation that resonants and obstruents are lengthened after stressed schwa. These consonants are pronounced as geminates. In contrast, consonants are not lengthened when they occur in intervocalic position after a stressed full vowel. It will be argued that this is another case in which the observed contrast is governed by the constraint $*ə́]_{\sigma}$.

5.3.1 Geminate Resonants

Resonants are lengthened when they follow a stressed schwa, as shown by the data in (24).

(24) Cə́R:V

	Input	Syllabification	Output	Gloss
a.	ǰmitam̓	ǰə́m . me . tam̓	ǰɪ́m:etàm̓	*it's not the right way*
a'.	ǰmitam̓ č	ǰə́m . me . tʌm̓č	ǰɪ́m:etʌ̀m̓čʰ	*I'm uncomfortable*
b.	čni	čə́n . ni	čɪ́n:e	*it's me*
c.	k̓ʷn-i-t-'uɬ č it	k̓ʷə́n . ne . tùɬ . čit	k̓ʷʊ́n:etòɬ čitʰ	*I've seen it already*

Syllabification presented in Column 2 represents speakers' judgements, and is correlated with the increased duration which is documented in Column 3. In contrast, resonants are not lengthened when they occur in intervocalic position following a stressed full vowel, as shown by the data in (25).

(25) No Gemination

	Input		Output	Gloss
a.	pilq	piləq	pé . lʌq	*bracket fungus*
a'.	DIM-pilq-[i]	pi-p[a]l[i]q	pé . pʌ . lɛq^h	*small bracket fungus*
b.	tumiš	túmɩš	tú . mɩš	*man*
c.	lamatu	lámatu	lá . ma . to	*sheep*
d.	q̓^{w}alas	q̓^{w}álʌs	q̓^{w}á . lʌs	*raccoon*
e.	t̓ay=aq=min	t̓áyɛqmɩn	t̓á . yɛq . m̈ɩn .	*clam shell*
f.	haǰuq^w	háǰɔq^w	há . ǰɔq^w	*steam cook*
g.	mawič	máwɩč	má . wɩč	*fawn, young deer*
h.	DIM-walθ-[i]+[ʔ]	wá-wal̓[i]θ	wá . waʔ . lɩθ.	*small bullfrog*
h'.	walθ	wálθ	wálθ	*bullfrog*

5.3.2 Geminate Obstruents

The next section shows that intervocalic obstruents show the same behaviour as intervocalic resonants. When an obstruent occurs between two full vowels, gemination does not take place as in (26), whereas when an obstruent occurs after a stressed schwa and before a following full vowel, it is lengthened, as in (27) Column 3.

(26)

	Input	Syllabification	Output	Gloss
a.	tiqiw	ti . qiw	té . qɛw	*horse*
b.	t̓uɬaɬ	t̓u . ɬaɬ	t̓ó . ɬʌɬ	*bed*
c.	č̓ač̓aš	č̓a . č̓aš	č̓ɛ́ . č̓ɛš	*snag (tree)*
d.	q̓aqiq^w	q̓a . qiq^w	q̓á . qɛq^w	*bladder wrack*

(27) Gemination

	Input	Syllabification	Output	Gloss
a.	ppa	pə́p . pa	pə́p:ʌ	*pepper*
b.	ƛkʷ-NTr-'uɬ a čxʷ	ƛə́kʷ . kʷuxʷuɬàčxʷ	ƛʊ́kʷ:uxʷuɬæ̀čw̥	*Did you catch it?*
b'.	ƛkʷ-t ga	ƛə́kʷt ga	ƛʊ́kʷt gʌ	*catch it!*
c.	tq=ipan-t ga	tə́q . qi . pa(n)t . ga	tʌ́q:epʌ̀t ga	*close the lid*
c'.	tq=ipan-t-'uɬ a čxʷ	tə́q .qi .pà(n).tu.ɬà.čxʷ	tʌ́q:epàtoɬæ̀čw̥	*Did you close it?*
c''.	tq-t-'uɬ čan	tə́q . tɔɬ . čɩn	tʌ́qtɔɬčɩn	*I closed it*
d.	qʷs-[i]m	qʷə́s . sim	qʷʌ́s:em	*white foam, froth*
e.	qx̌=amiɬ	qə́x̌ . x̌a . miɬ	qʌ́x̌:amɩɬ	*lots of food*
e'.	qx̌	qə́x̌	qʌ́x̌	*lots, many*
f.	ɬx̌=aqap	ɬə́x̌ . x̌a . qap	ɬʌ́x̌:aqʌp	*bad smell*
f'.	ɬx̌	ɬə́x̌	ɬʌ́x̌	*bad*
g.	mx̌=awuɬ	mə́x̌ . x̌a . wʊɬ	mʌ́x̌:awʊɬ	*half moon*

Gemination is a form of Coda/Onset formation which ensures the optimal satisfaction of three independent constraints: (i) that the head of the Prosodic Word best satisfies constraints on phonological weight; (ii) Faithfulness to underlying moraic structure; and (iii) avoids violation of the constraint $*\acute{ə}]_{\sigma}$.

5.4 h-epenthesis

Epenthesis of the least marked consonant [h] is one way of resolving vowel hiatus in Sliammon. When a vowel-final Root is followed by a vowel-initial Lexical Suffix, [h] surfaces between the two vowels in order to avoid hiatus. Since h-epenthesis is driven by the constraint which bans vowels in hiatus, epenthetic [h] is not expected after Roots which end in a consonant. However, when a CəC Root is followed by a vowel-initial LS, an epenthetic [h] does surface.

This section aims at accounting for this rather unexpected pattern. It will be argued that [h] epenthesis occurs after CəC Roots in order to satisfy the constraint $*\acute{ə}]_\sigma$.

5.4.1. Root=LS: h-epenthesis

When a vowel-final Root is followed by a vowel-initial Lexical Suffix (=LS), an [h] surfaces between the two vowels, as shown by the data in (28.a-h). The data in (28.a'-h') shows that the Root is vowel-final. The LSs =aya *place, container,* =ukʷt *blanket, covering,* =aǰa *leaves, foliage,* =awus *eye,* and =aw̓txʷ *building* are all vowel-initial (cf. Appendix VI for additional examples of each LS).

(28) Root=LS

	Input	[h] epenthesis	Output	Gloss
a.	kapi=aya	kapi[h]aya	kʸǽpihàyɛ	*coffee pot*
a'.	kapi	kapi	kʸǽpi ~ kʸɛ́pi	*coffee* (< English)
b.	šukʷa=aya	šukʷa[h]aya	šúkʷahàyɛ	*sugar bowl*
b'.	šukʷa	šukʷa	šúkʷa	*sugar* (< English)
c.	t̓ᶿy̓a=aya	t̓ᶿəʔya[h]aya	t̓ᶿáʔyɛhàyɛ	*refrigerator*
c'.	t̓ᶿy̓a	t̓ᶿəʔya	t̓ᶿáʔyɛ	*store food*
d.	tala=aya	tala[h]aya	tálahàyɛ	*wallet*
d'.	tala	tala	tála	*money* (loan)
e.	lamatu=ukʷt	lamatu[h]ukʷt	lámatuhùkʷt	*sheep's wool ; sweater*
e'.	lamatu	lamatu	lámatu ~ lámato	*sheep* (Fr.< C.Jargon)
f.	ʔusa=aǰa	ʔusa[h]aʔǰa	ʔósahàʔǰɛ	*blueberry bush*
f'.	ʔusa	ʔusa	ʔósa	*blueberry*
g.	tala=awus=tn	tala[h]awustən	tálahàwʊstən	*eye glasses*
g'.	tala	tala	tala	*money* (loan)
h.	piya=aw̓txʷ	piya[h]aw̓txʷ	píyɛhʌ̀w̓txʷ	*drinking place, pub*
h'.	piya	piya	píyɛ	*beer* (< English)

5.4.2 Lack of [h] epenthesis after C-final Roots

If the Root/Stem ends in a consonant, then generally no [h] surfaces, as shown by (29-32).

(29) LS =aya *place, container*

	Input	No [h] epenthesis	Output	Gloss
a.	pukʷ=aya	pú:kʷàya	pú:kʷàyɛ	*book bag*
a'.	pukʷ	pukʷ	púkʷ	*book* (< English)
b.	xʷuǰ-m=aya	xʷúǰumàya	xʷúǰumàyɛ	*store*
b'.	xʷuǰ-m	x̌ʷuǰəm	x̌ʷúǰʊm	*sell*
c.	ngin=aya	nə́ginàya	nɩ́ginàyɛ	*lunch basket*
c'.	ngin	nəgin	nɩ́gin	*lunch*
d.	k̓ʷəɬt=aya	k̓ʷə́ɬtàya	k̓ʷʌ́ɬtayɛ	*cupboard*
d'.	k̓ʷɬt	k̓ʷəɬt	k̓ʷʌ́ɬt	*plate*
e.	ƛ̓aɬ-m=aya	ƛ̓áɬəmàya check -ə-	ƛ̓áɬəmàyɛ	*salt shaker*
e'.	ƛ̓aɬ-m	ƛ̓aɬəm	ƛ̓áɬəm	*salt*
f.	p̓q̓=aya	p̓ə́ʔq̓aya	p̓áʔq̓ayɛ	*stove pipe*
f'.	p̓q̓	p̓əq̓	p̓ʌ́q̓	*smoke*
g.	wəx̌wəx̌=aya	wə́x̌wəx̌àya check ə	wʌ́x̌wʌx̌àyɛ	*cigarette case*
g'.	CH-wx̌	wəx̌-wəx̌	wʌ́x̌wʌx̌	*cigarette*

(30) LS =ukʷt *blanket, covering*

	Input	No [h] epenthesis	Output	Gloss
a.	t̓t̓ᶿ-[i]m=ukʷt	t̓əʔt̓ᶿimukʷt	t̓áʔt̓ᶿemʊkʷt	*red blanket*
b.	kʷs-[i]m=ukʷt	kʷəsimukʷt	kʷʊ́semʊkʷt	*blue jeans, denim*
c.	p̓uq̓ʷ=ukʷt	p̓uq̓ʷukʷt	p̓óq̓ʷʊkʷt	*grey blanket*
d.	kʷum=ukʷt	kʷumukʷt	kʷúmʊkʷt	*red (pink) blanket*
e.	x̌ʷƛ̓=aǰ=ukʷt	x̌ʷəƛ̓aǰukʷt	x̌ʷə́ƛ̓aǰʊkʷt	*mtn. goat blanket*
f.	pəɬt=ukʷt	pəɬtukʷt	pə́ɬtʊkʷt	*thick blanket*

(31) LS =aǰ̓a *leaves, foliage*

	Input	No [h] epenthesis	Output	Gloss
a.	x̌^{w}us-Vm=aǰ̓a	x̌^{w}úsumàʔǰa	x̌^{w}ósɔmàʔǰɛ	*soapberry leaves*

(32) LS =awus *eye*

	Input	No [h] epenthesis	Output	Gloss
a.	ƛ̓ip=awus	ƛ̓ipawus	ƛ̓épawʊs	*area below the eye*
b.	q^{w}up=awus	q^{w}úpawus	q^{w}ópawʊs	*eyelashes*
c.	ɬak̓^{w}=awus	ɬák̓^{w}awus	ɬák̓^{w}awʊs	*swollen eye*

5.4.3 Apparent Exceptions

When a CəC Root is followed by a vowel-initial Lexical Suffix, an intrusive [h] surfaces. Given the behaviour of other consonant-final roots above, this is somewhat unexpected. The analysis proposed here is that the [h] functions as the Onset to the following syllable, and therefore prevents a violation of the constraint *ə́]$_\sigma$. Consider the data in (33).

(33) [h] epenthesis

	Input	[h] epenthesis	Output	Gloss
a.	p̓θ=iq^{w}an	p̓əθ[h]iq^{w}an	p̓ʌ́θhɛq^{w}ʌn	*black hair*
b.	x^{w}s=iq^{w}an	x^{w}əs[h]iq^{w}an	x^{w}ə́shɛq^{w}ʌn	*black hair*
c.	x̌s=aya	x̌əs[h]aya	x̌ʌ́shayɛ	*oil can*
d.	č̓ɬ=uk^{w}t	č̓əɬ[h]uk^{w}t	č̓ɩ́ɬhʊk^{w}t^h	*rain coat*
e.	č̓ɬ=uk^{w}t=nač	č̓əɬ[h]uk^{w}tnač	č̓ɩ́ɬhʊk^{w}tnàč^h	*rain pants*
f.	t̓š=iq^w	t̓əš[h]iq^w	t̓ɩ́šhɛq^w	*nasal mucus, snot*
g.	q̓x̌=awus	q̓əx̌[h]awus	q̓ʌ́x̌hawʊs	*black eye*

Notice that in each example, epenthetic [h] is preceded by a fricative. My current database includes only a single example of a CəC Root ending in a stop followed by a vowel-initial LS. As seen in (34), it takes an epenthetic [ʔ].

(34) [ʔ] epenthesis

	Input	[ʔ] epenthesis	Output	Gloss
a.	pq=iqʷan	pəq[ʔ]iqʷan	pʌ́qʔɛqʷʌn	*blonde hair*

The presence of [ʔ] in this case may be determined by the [-continuant] specification of the preceding consonant. The least marked consonant [h] appears to be epenthesized between vowels, as in (28) and after fricatives, as in (33) whereas [ʔ] occurs with CəC Roots ending in a stop.

5.4.4 Proposed Analysis

As shown by the ungrammatical forms in (35), if a laryngeal [h, ʔ] were not epenthesized, then this would leave schwa in a stressed open syllable.

(35)

	Input	Output	*ə́]$_\sigma$	Gloss
a.	p̓θ=iqʷan	p̓ʌ́θhɛqʷʌn	*p̓ə́ . θɛqʷʌn	*black hair*
b.	xʷs=iqʷan	xʷə́shɛqʷʌn	*xʷə́ . sɛqʷʌn	*black hair*
c.	x̌s=aya	x̌ʌ́shayɛ	*x̌ə́ . sayɛ	*oil can*
d.	č̓ɬ=ukʷt	č̓ɩ́ɬhʊkʷtʰ	*č̓ə́ . ɬʊkʷt	*rain coat*
e.	č̓ɬ=ukʷt=nač	č̓ɩ́ɬhʊkʷtnàčʰ	*č̓ə́ . ɬʊkʷtnàč	*rain pants*
f.	t̓š=iqʷ	t̓ɩ́šhɛqʷ	*t̓ə́ . šɛqʷ	*nasal mucus, snot*
g.	q̓x̌=awus	q̓ʌ́x̌hawʊs	*q̓ə́ . x̌awʊs	*black eye*
h.	pq=iqʷan	pʌ́qʔɛqʷʌn	*pə́ . qɛqʷʌn	*blonde hair*

Epenthesis of the laryngeal ([h/ʔ]) ensures that stressed schwa occurs in a closed syllable. This means that the cost associated with epenthesis must be less than the cost associated with leaving schwa in a stressed open syllable. The partial constraint ranking is given in (36).

(36)

*ə́]$_\sigma$ >> DEP[h/ʔ]

Notice that epenthesis occurs at a morphological boundary, and therefore does not interrupt the Contiguity of either the Root or the following Lexical Suffix. This is shown by the tableau in (37).

(37) x̌s=aya [x̌ʌ́shayɛ] *oil can*

x̌[ə]s=aya	O-CONTIGUITY ROOT	*ə́]σ	DEP[h/ʔ]
☞ a. x̌ə́s . [h]a . ya			*
b. x̌ə́ . sa . ya		*!	
c. x̌ə́[h] . sa . ya	*!		

The optimal candidate (37.a) entails a low-ranking DEP[h] violation in order to satisfy the higher - ranking constraint *ə́]σ. Notice that epenthesis of this unmarked consonant occurs after the Root x̌əs- *oil* and before the LS =aya *place, container.* Since epenthesis occurs between morphemes, the high-ranking constraint which ensures that Roots are a continuous uninterrupted substring (O-Contiguity Root) is also satisfied. The output candidate in (37.b) is ruled out by the constraint which bans schwa in a stressed open syllable, whereas candidate (37.c) entails epenthesis within the domain of the Root. This incurs a fatal violation of the high-ranking Contiguity constraint.

The next section explores the implications of the analysis with another morpho-phonological process: Imperfective reduplication.

5.5 Implications: Imperfective Reduplication

5.5.1 Strong Roots

Kroeber (1989:109) observes that when strong roots undergo CV- Imperfective reduplication they retain their root vowel. Examples of perfective and imperfective pairs from my own research include the following examples, and confirm Kroeber's findings. CAC roots are presented first in (38-40) whereas the perfective and imperfective pairs of CəC roots will be presented in (41).

For CAC roots, the Imperfective aspect is formed by reduplicating the initial consonant (C_1) and the vowel of the base with no reduction of the original root vowel. CAC Roots retain the root vowel (V_2) in the output form when they undergo Imperfective reduplication: [CV_1-CA_2C....]. Note also that the vowel of the reduplicant has the same basic vowel quality as the root vowel: [Ci-CiC... , Cu-CuC..., Ca-CaC...], as shown in (38-40) below. As can be observed from the Imperfective (IMP) examples, the second consonant of the root is never copied (cf. Sapir (1915), Blake (1992), Watanabe (1994, 2000) on Imperfective reduplication).

CAC Roots

(38) **Imperfective Reduplication: CiC Roots**

	Input		**Output**	**Gloss**
a.	p̓it̓$^{\theta}$-ay=it̓$^{\theta}$a	p̓it̓$^{\theta}$ayit̓$^{\theta}$a	p̓ét̓$^{\theta}$ayit̓$^{\theta}$ʌ	*wash clothes*
a'.	IMP-p̓it̓$^{\theta}$-ay=it̓$^{\theta}$a	p̓i-p̓it̓$^{\theta}$-ayit̓$^{\theta}$a	p̓ép̓et̓$^{\theta}$ayit̓$^{\theta}$ʌ	*washing clothes*
b.	ʔilq̓ay	ʔilq̓ay	ʔέlq̓ay ~ ʔέɬq̓ay	*barbecue deer*
b'.	IMP-ʔilq̓ay	ʔi-ʔilq̓ay	ʔέʔεɬq̓ày	*barbecuing deer*
c.	ʔim-aš	ʔimaš	ʔέmʌš	*walk*
c'.	IMP-ʔim[-'Vg-][i]š	ʔi-ʔim-ig-iš	ʔέʔεmεgiš	*people walking*
d.	ʔiɬtan	ʔiɬtan	ʔέɬtʌn	*eat*
d'.	IMP-ʔiɬtan+[ʔ] č	ʔi-ʔiɬtan̓ č	ʔέʔεɬtàn̓č	*I'm eating*
e.	t̓in	t̓in	t̓έn	*barbecued fish*
e'.	IMP-t̓in-ʔm	t̓i-t̓in-ʔəm	t̓έt̓εnʔəm	*barbecuing fish*
f.	θiq̓-m	θiq̓əm	θέq̓əm	*dig*
f'.	IMP-θiq̓-t-as	θi-θiq̓-[a]-t-as	θέθεq̓ètʌs	*s.o. is digging it*

(39) **Imperfective Reduplication: CuC Roots**

a.	ǰuθ-t	ǰuθ-ə-t	ǰúθʊt	*push it*
a'.	IMP-ǰuθ-t-as	ǰu-ǰuθ-[v]-t-as	ǰúǰuθotəs	*he is pushing it*
b.	sup-ʔm	sup-ʔəm	sópəm ~ sóp̓əm	*chop wood*
b'.	IMP-sup-ʔm	su-sup-ʔəm	sósop̓əm	*chopping wood*
c.	guxʷ-m	guxʷ-əm	gʷúxʷʊm	*bark (as dog)*
c'.	IMP-guxʷ-m	gu-guxʷ-əm	gʷúgʷuxʷʊ̀m	*barking*
d.	ǰux̌ʷ-t	ǰux̌ʷ-ət	ǰóx̌ʷət	*vomit*
d'.	IMP-ǰux̌ʷ-t	ǰu-ǰux̌ʷ-ət	ǰúǰox̌ʷʌt	*vomiting*
e.	ʔuɬqʷu	ʔuɬqʷu	ʔóɬqʷo	*dig clams*
e'.	IMP-ʔuɬqʷu+[ʔ]	ʔu-ʔuɬqʷuʔ	ʔóʔoɬqʷòʔ	*digging clams*

(40) **Imperfective Reduplication: CaC Roots**

a.	č̓ag-anaq	č̓ag-anaq	č̓ɛ́gʌnʌq	*help s.o.*
a'.	IMP-č̓ag-anaq	č̓a-č̓ag-anaq	č̓ɛ́č̓egʌnʌq	*helping s.o.*
b.	hayɬ-m	hayɬ-əm	háyɬʌm̓ ~ háyɬʌm	*flirt*
b'.	IMP-hayɬ-m+[ʔ]	ha-hayɬ-əm̓	háhayɬʌm̓	*flirting*
c.	qʷasm	qʷasəm	qʷásəm	*flower*
c'.	IMP-qʷasm+[ʔ]	qʷa-qʷasəm̓	qʷáqʷasəm̓	*flowering*
d.	ʔaxʷ	ʔaxʷ	ʔáxʷ	*(falling) snow*
d'.	IMP-ʔaxʷ	ʔa-ʔaxʷ	ʔáʔaxʷ	*it's snowing*

5.5.2 Weak Roots

Contrast this with the behaviour of Weak Roots which surface with an initial Cə-reduplicative prefix followed by the CC form of the Root: [Cə-CC], as illustrated by the data in (41). Weak roots lack a vowel between the first and second consonants of the Root. If schwa is epenthetic, then these may be considered vowelless roots which do not have schwa epenthesis after the first consonant of the root in Imperfective forms: *Cə-C[ə]C-VC, since the root final consonant is syllabified as the Onset to the following syllable. If schwa is present in the Input, then syncope of the root vowel takes place in order to satisfy constraints on syllabification. In particular, syncope would occur in order to prevent a violation of *ə́]$_{\sigma}$. The data below are presented under the hypothesis that these roots are vowelless, and schwa is epenthetic.

(41) **Imperfective Reduplication: Weak Roots**

	Input		**Output**	**Gloss**
a.	ƛpxʷ	ƛəpxʷ	ƛə́pxʷ ~ ƛə́pw̥	*break*
a'.	IMP-ƛpxʷ-t č	ƛə-ƛpxʷ-ət č	ƛə́ƛpxʷəč	*I'm breaking it*
b.	x̌ʷƛ̓=igan	x̌ʷəƛ̓=igan	x̌ʷáʔƛ̓egən	*half full*
b'.	IMP-x̌ʷƛ̓=igan	x̌ʷə-x̌ʷƛ̓=igan	x̌ʷáx̌ʷƛ̓egən	*half filling s.t.*
c.	tk̓ʷ-t	tək̓ʷ-t	túk̓ʷt ~ tʊ́k̓ʷt	*pull it*
c'.	IMP-tk̓ʷ-t-as	tə-tk̓ʷ-t-as	tə́tk̓ʷtas ~ tə́tk̓ʷtʌs	*he's pulling it*
d.	k̓ʷɬ	k̓ʷəɬ	k̓ʷʊ́ɬ	*spill, tip over*
d'.	IMP-k̓ʷɬ	k̓ʷə-k̓ʷɬ	k̓ʷúk̓ʷɬ	*spilling*
e.	q̓ʷx̌-t čn sm	q̓ʷəx̌-(t) čən səm	q̓ʷʌ́x̌ čɩn səm	*I'll fillet it (fish)*
e'.	IMP-q̓ʷx̌-t čn	q̓ʷəq̓ʷx̌-t čən	q̓ʷɔ́q̓ʷx̌tᵊ čɩn	*I'm filleting it*
f.	θt̓ᶿ-m	θəʔt̓ᶿəm	θáʔt̓ᶿəm	*jig for cod*
f'.	IMP-θt̓ᶿ-m+[ʔ] č	θə-θt̓ᶿəm̓ č	θɩ́θt̓ᶿəm̓č ~ θʌ́θt̓ᶿəm̓č	*I'm jigging*
g.	tg=qin	təwqin	tʊ́wqɛn	*answer back*
g'.	IMP-tg=qin+[ʔ]	tə-tg-[a]-qin̓	tə́tgaqɛn̓	*answering back*

Kroeber (1989) also notes that a number of roots of the shape Cah, Caʔ display the pattern shown by weak roots of the shape CəC. He states that these are likely roots of the form Cəh, Cəʔ in which the schwa is lowered before a laryngeal. This is the position adopted here and represented in (42) Column 2.

(42) **Imperfective Reduplication: Ch, Cʔ / Cəh, Cəʔ Roots**

a. qh-ʔm	qəh-ʔəm	qə́hʔəm	*lift (s.t.)*
a'. IMP-qh-ʔm	qə-qh-[a]ʔəm	qʌ́qhaʔʌm	*lifting (s.t.)*
b. mʔ-t	məʔ-t	mə́ʔt	*take it*
b'. IMP-mʔ-t-as+[ʔ]	mə-m̓ʔ-[a]-t-as	mə́ʔmatʌs	*s/he is taking it*

Notice that the reduplicative prefix in word-initial position receives primary stress in keeping with the generalization that stress in Sliammon is aligned with the left-edge of the stem. Consider further discussion of what prevents schwa from occurring between C_1 and C_2 of the Root. For example, why is [tə́tgaqɛn̓] *answering back* optimal rather than the ungrammatical example *[tə́təgaqɛn̓]. Not only does *[tə́təgaqɛn̓] violate the constraint *ə́]σ but it also creates a structure in which the second instance of schwa occurs in an unstressed open syllable in post-tonic position. If schwa is non-moraic, then both the first and the second syllables lack phonological weight: Cə́Cə. In contrast, the optimal candidate [tə́tgaqɛn̓] satisfies *ə́]σ since schwa occurs in a closed syllable. In addition, the coda consonant t creates a mono-moraic closed syllable - a syllable which has phonological weight.

5.5.3 Discussion and Analysis

Consider the forms in (43)

(43)

	Input		Output	Gloss
a.	k̓ʷɬ	k̓ʷəɬ	k̓ʷʊ́ɬ	*spill, tip over*
a'.	IMP-k̓ʷɬ	k̓ʷə-k̓ʷɬ	k̓ʷʊ́k̓ʷɬ ~ k̓ʷúk̓ʷɬ	*spilling*
b'.	IMP-k̓ʷəɬ	*k̓ʷəʔk̓ʷəɬ	*k̓ʷaʔk̓ʷəɬ	*spilling*
c'.	IMP-k̓ʷəɬ	*k̓ʷə-k̓ʷəɬ	*k̓ʷə́k̓ʷəɬ	*spilling*

As argued in §5.1, glottalized obstruents are re-structured (i.e. ʔk̓ʷ) so that stressed schwa occurs in a closed syllable. One question which arises is why the output candidate in (43.a') is more harmonic than the sub-optimal candidate in (43.b')? What constraints or set of constraints rule out (43.b')? Consider the tableau in (44) which outlines an analysis.

(44)

IMP-k̓ʷɬ	*ə́]σ	SEG-INTEGRITY	DEP[ə]
☞ a'. k̓ʷə́k̓ʷɬ			*
b'. k̓ʷə́ʔk̓ʷəɬ		*!	**
c'. k̓ʷə́k̓ʷəɬ	*!		**

The optimal candidate (44.a') incurs only one violation of the constraint DEP[ə], which alone suffices to create an output form which satisfies *ə́]σ without requiring the deconstruction of /O'/ into [ʔO'], violating what may be termed segmental /O'/-integrity. Note that regardless of the ranking of these constraints, both other candidates incur two violations of DEP[ə], as well as a violation of one of the other crucial constraints.

Consider what further objections there would be to a surface candidate like *[k̓ʷə́k̓ʷəɬ] (=44.c'). Notice that this candidate also violates PEAK PROM FT since the unstressed syllable is mono-moraic whereas the syllable bearing primary stress is non-moraic.

5.6 Summary

In summary, there are a number of seemingly unrelated cases which receive a uniform account given the constraint *ə́]$_\sigma$. Each set of examples involves ensuring that the optimal output candidate involves a closed Cə́C syllable as opposed to an open Cə́ syllable. Even though this is a configuration which is avoided if possible, the next section explores examples which do seem to involve schwa in a stressed open syllable - this is a classic case of constraint conflict and we need to ask what would compel a violation of *ə́]$_\sigma$.

5.7 Stressed schwa in an open syllable

5.7.1 The Problem

Consider the following examples which provide evidence that schwa does occur in a limited number of stressed open syllables.

(68)

a. ngi. a wut-t	nəgi a wutət	nɩ́ . gi ʔʌ wʉ́tɔtʰ	*Did you bend it?*
b. q̓g-m+[i]	q̓əg-[i]m	q̓ʌ́ . gɩm	*howl; siren going*

5.7.2 Proposed Analysis

As argued above, it is important that primary stress is aligned with the left-edge of the stem, and that the constraint *ə́]σ is also satisfied. The best output is a candidate which satisfies both of these constraints, if possible. If not, then the highest-ranking constraint takes precedence. In this case, it is more important for the head of the Prosodic Word to be aligned with the left-edge of the Stem than it is to satisfy $*ə́]_{\sigma}$, as shown by the output and syllabification of the examples in (68.a-b). This is important since it establishes the relative ranking of these two constraints.

(69)

ALIGN L PRWD >> *ə́]σ

In addition, since Complex Onsets are generally ruled out in Sliammon, as argued in §3.2.2.1, candidates such as *ngí and *q̓gɩ́m are clearly not optimal. This entails that *Complex Onset outranks *ə́]σ.

(70) *Complex Onset >> *ə́]σ

The question which arises with respect to (68.a-b) is why the intervocalic [g] fails to undergo gemination in order to avoid a violation of *ə́]σ similar to the cases discussed in §5.3? Recall from §2, that the sonorant obstruent /g/ is variably realized as [g ~ k ~ xʷ ~ w ~ u] depending on its syllabic position. In particular, in word-internal syllable-final position /g/ surfaces as [w], and in

Onset position /g/ surfaces as [g]. Since geminates are by definition a single set of features associated with two prosodic positions, the candidates *nɪ́g:i and *q̓ʌ́g:ɩm violate the constraints on the realization of /g/. The candidates *[nə́w. i] and *[q̓ə́w . ɩm] provide evidence that Onset outranks *ə́]σ.

(71) Onset >> *ə́]σ

5.8 Formal Issue: The constraint *ə́]σ

As we have observed, stressed schwa in an open syllable tends to be avoided, if possible. It seems important to consider what generalization(s) the informal constraint *ə́]$_{\sigma}$ captures. Cə́ constitutes a weightless syllable which, within the framework adopted here, is Nuclear but has no moraic content, following Shaw (1995, 1996). Shaw (1996) posits that optimal syllables are both nuclear and moraic; that is, they satisfy the constraint which states that all syllables have nuclei (SYLL NUC), and that all syllables have phonological weight (SYLL MORA), where weight is represented in terms of moras. An epenthetic schwa is characteristically inserted to ensure satisfaction of SYLL NUC. Under the further hypothesis that schwa itself is weightless, then a schwa in an open syllable fails to satisfy the constraint on phonological weight (SYLL MORA). If there are two syllables within the stress foot, the initial Cə́. syllable may also violate PEAK PROM FT.

Consider the following Foot structure which clarifies this point further. If schwa is non-moraic, then schwa in a stressed open syllable violates SYLL MORA since the first syllable lacks phonological weight. In addition, in order to satisfy FTBINμ, the non-head would have to be bimoraic, leading to a non-optimal structure like the one in (72).

(72)

```
              FT
            /    \
          s        w
          σ        σ
         /|       /|\
        / N      / N \
       /  |     /  |  \
      /   |    /   μ   μ
     /    |   /    |    \
    C     ə́  C     V     C
```

This represents a surface candidate in which the phonological weight of the head of the Foot is less than the weight of the non-head; this violates PEAK PROM FT as discussed in detail in Chapter 4 (§4.3.2.1). Foot well-formedness is therefore at the heart of the issue. The constraints in the grammar drive durational evenness typical of trochaic systems, and prominence of the head of the Foot, as shown by the more optimal structures like the one in (73). (Note: the structure in (73) also assumes that Full Vowel Reduction has takes place in the weak member of the Foot).

(73)

```
              FT
            /    \
          s        w
          σ        σ
         /|\      /|\
        / N \    / N \
       /  |  \  /  |  \
      /   |   μ/   |   μ
     /    |   \    |    \
    C     ə́   C C  V     C
```

This chapter provides both formalization and a proposed explanation of the basic insight presented in Blake (1992) that schwa in Sliammon is licensed by a moraic coda consonant.

Chapter 6: Two Further Implications

Anicca , Dukkha , Anatta

6.0 Introduction

This chapter explores two further implications for the analysis developed in the context of this dissertation. §6.1 documents and analyzes the variant forms of the possessive -hV suffix in Sliammon. The account presented here accounts for its variable behaviour: it is a suffix following vowel-final stems whereas it is an "infix" following consonant-final stems. Stems which end in a consonant cluster take [i] epenthesis rather than schwa epenthesis. The fact that the vowel [i] is epenthesized is somewhat unexpected given the hypothesis that schwa is the epenthetic vowel in the language. §6.2 makes important claims regarding the status and form of prefixes, interacting with pervasive constraints on the morpho-syntactic structure of the language. The effect of these general constraints on two prefixes in particular is dicussed. One is the s-nominalizer, broadly attested across other languages in the Salish family, but conspicuously absent in Sliammon. The second is a plural prefix/infix, here hypothesized to be /L'-/, cognate with the plural l-infix in Saanich. The existence of this prefix has not been previously recognized by others working on Sliammon, undoubtedly due to its variable realization, viz. [-iʔ ~ -uʔ ~ -aʔ]. What is shown here is that these variants follow directly from the convergence of hypotheses related to the realization of sonorant /L'/, combined with constraints on prefixation. A crucial observation related to both these underlying prefixes is that both, being strictly "consonantal", would violate the constraint *Complex Onset if they were simply prefixed, i.e. *s-C..., *L'-C... Significantly, ə-epenthesis is not an available strategy to rescue either of these cases.

6.1 Possessive Affix: -hV

6.1.1 Translaryngeal Harmony and the Possessive Affix

Sliammon has a possessive affix which is translated with the following range of meanings: 'have, own, be wearing, have s.t. with oneself' or 'have' in the sense of 'caught, shot'. The possessive data presented here are cited from a single speaker but are entirely consistent with the documentation of the possessive suffix -hV recorded by Watanabe (2000).

6.1.1.1 Translaryngeal Harmony

The possessive affix is proposed to be an initial h followed by an unspecified full vowel V (Nucμ) : /-hV/. Stated in prosodic terms, this affix consists of a mono-moraic "core" syllable. The vowel quality of the unspecified full vowel is determined by the quality of the immediately preceding full vowel, as shown by the data in (1-3). The position of the affix will be discussed in detail in §6.1.2. Basically, it is suffixed to a vowel-final stem, but with consonant-final stems it is infixed into the stem from the right margin, such that it is positioned immediately before the stem-final consonant. For the moment, our focus is on the *quality* of the vowel of the possessive affix. For example, if the final vowel of the stem is /i/, then the vowel in the possessive affix is also /i/, as shown by the data in (1).

(1) Final vowel /i/

	Input	i-hi-	Output	Gloss
a.	ʔatnupil	ʔatnupil	ʔátnopɛ̀l	*car*
a'.	ʔatnupil-hV č	ʔatnupi-hi-l č	ʔátnope·hèlč	*I have a car*
b.	nx^{w}iL	nəx^{w}iɬ	nʊ́x^{w}ɩɬ	*dugout canoe*
b'.	nəx^{w}iL-hV	nəx^{w}i-hi-ɬ	núx^{w}ehɛ̀ɬ ~ nʊ́x^{w}ehɛɬ	*He has a canoe*
c.	qayix̌	qayix̌	qáyɛx̌	*fish eggs, roe*
c'.	qayix̌-hV	qayi-hi-x̌	qáyɛhɛ̀x̌	*It has eggs, roe*
d.	ʔimin	ʔimin	ʔɛ́mɩn	*door*
d'.	ʔimin	ʔimi-hi-n	ʔɛ́me·hɛ̀n	*It's got a door*
e.	t̓in	t̓in	t̓ɛ́n	*barbecued fish*
e'.	t̓in-hV č	t̓i-hi-n č	t̓ɛ́·hɛnč^{h}	*I've got b. fish*
f.	saplin	saplin	sáplɛn	*bread*
f'.	saplin-hV č	sapli-hi-n č	sáplɛ hɛ̀nč^{h}	*I have bread*
g.	č̓tq-ʔm=min	č̓ətqamin	č̓ɩ́tqamɛn	*knife*
g'.	č̓tq-ʔm=min	č̓ətqami-hi-n č	č̓ɩ́tqa·mɛhɛ̀nč^{h}	*I have a knife*

When the final vowel of the stem is /u/, the vowel of the possessive affix is also /u/, as shown by the data in (2).

(2) Final vowel /u/

	Input	u-hu-	Output	Gloss
a.	pukʷ	pukʷ	púkʷ	*book*
a'.	pukʷ-hV č	pu-hu-kʷ č	púhohòkʷčʰ	*I have a book*
b.	ʔawukʷ	ʔawukʷ	ʔʌ́wʊkʷ	*tobacco*
b'.	ʔawukʷ-hV č	ʔawu-hu-kʷ č	ʔʌ́wohòkʷčʰ	*I have tobacco*
c.	č̓an̓u	č̓aʔnu	č̓ɛ́ʔno	*dog*
c'.	č̓an̓u-hV č	č̓aʔnu-hu č	č̓ɛ́ʔnohòč	*I've got a dog*
d.	kapu	kapu	kʸɛ́po ~kʸǽpo ~kápo	*coat*
d'.	kapu-hV č	kapu-hu č	kʸɛ́pohòčʰ	*I've got a coat on*

The data in (3) shows that when the stem-final vowel is /a/, then the vowel of the possessive affix is also /a/.

(3) Final vowel /a/

	Input	a-ha-	Output	Gloss
a.	mix̌aɬ	mix̌aɬ	mɛ́x̌ʌɬ	*bear*
a'.	mix̌aɬ-hV č	mix̌a-ha-ɬ č	mɛ́x̌ahʌ̀ɬčʰ	*I shot/ caught a bear*
b.	qigaθ	qigaθ	qé·gʌθ	*deer*
b'.	qigaθ-hV č	qiga-ha-θ č	qégahʌ̀θčʰ	*I've got a deer*
c.	ƛ̌in̓a	ƛ̌iʔna	ƛ̌ɛ́ʔna ~ ƛ̌ɛ́ʔnʌ	*oolichan oil*
c'.	ƛ̌in̓a-hV č	ƛ̌iʔna-ha č	ƛ̌ɛ́ʔnahʌč	*I have oolichan oil*
d.	gaqaθ	gaqaθ	gáqʌθ	*husband*
d'.	gaqaθ-hV č	gaqa-ha-θ č	gáqahʌ̀θčʰ	*I have a husband*

e.	sup=nač	supnač	sópᵊnʌč	*tail*
e'.	sup=nač-hV	supn<u>a-ha</u>-č	sópnahʌč	*He's got a tail*
f.	ʔayaʔ	ʔayaʔ	ʔáyɛʔ	*house*
f'.	ʔayaʔ-hV	ʔay<u>a-ha</u>-ʔ	ʔáyɛhàʔ	*He's got a house*

As can be seen from (1-3) the vowel quality of the affix -hV corresponds to the quality of the immediately preceding full vowel, yielding [...i-hi , ...u-hu, ...a-ha] respectively.

The quality (i.e. features) of other non-adjacent vowels does not affect the vowel quality of the possessive affix, as shown by the contrast between the grammatical forms in (4) Column 2 and the ungrammatical data in Column 3.

(4)

	Input	**Harmony**	***Harmony**	**Gloss**
a.	nxʷiL-hV č	nəxʷ<u>i-hi-</u>ɬ č	*nəxʷi-hə-ɬ č	*I have a canoe*
b.	saplin-hV č	sapl<u>i-hi</u>-n č	*sapli-ha-n č	*I have bread*
c.	ʔawukʷ-hV č	ʔaw<u>u-hu</u>-kʷ č	*ʔawu-ha-kʷ č	*I have tobacco*
d.	č̓an̓u-hV č	č̓aʔn<u>u-hu</u> č	*č̓an̓u-ha č	*I've got a dog*
e.	qigaθ-hV č	qig<u>a-ha</u>-θ č	*qiga-hi-θ č	*I've got a deer*
f.	supnač-hV	supn<u>a-ha</u>-č	*supna-hu-č	*He's got a tail*

From the above data, it is clear there is no evidence that the featural specification of any of the adjacent consonants determines the basic vowel quality[1].

[1]As expected, the consonants do incrementally affect the height of the resultant surface vowel, as shown by the Output forms in (1-4). The [-bk] vowel /i/ is realized as [e ~ ɛ] in the environment of [h], as shown by the examples in (1). The round vowel /u/ is realized as [o] in the environment of [h], as shown by (2). The vowel /a/ is [a] as in (3) whereas it is phonetically raised to [ʌ] before a coronal.

6.1.1.2 Discussion and Proposed Analysis

The possessive affix is always preceded by a full vowel to its left, as seen by the data in (1-4) above. The vowel of the possessive affix is always identical to the full vowel which precedes it. It is proposed here that this is a form of translaryngeal harmony - the rightward spreading of the features of the full vowel onto an empty full vowel to its right, as in (5).

(5)

```
      PHAR
        |
    V  -h  V-
    |      /
    |     /
    [f]
```

Since [h] is proposed to be minimally specified as PHAR in Sliammon, the presence of the PHAR node will not block the harmony. Since the possessive affix always occurs towards the right-edge of the stem, it is often outside of the domain of Limited Vowel Harmony, and is therefore analyzed here as a separate example of translaryngeal harmony in the language. For independently motivated examples of Translaryngeal harmony, see §2.4.4.5 and discussion in Watanabe (2000).

6.1.2 Position of the Possessive Affix

Now consider the position of the possessive affix /-hV/.

6.1.2.1 Vowel-final stems

The possessive affix -hV is a suffix after vowel-final stems, as shown by the data in (6).

(6) Vowel-final stems

	Input		**Output**	**Gloss**
a.	č̓an̓u-hu č	č̓an̓u-hu č	č̓ɛ́ʔnohòčʰ	*I've got a dog*
b.	t̓ᶿx̌ʷu-hu č	t̓ᶿəx̌ʷu-hu č	t̓ᶿɔ́x̌ʷ:ohòčʰ	*I got a ling cod*
c.	kapu-hu č	kapu-hu č	kʸɛ́pohòčʰ	*I've got a coat on*
d.	ƛ̓in̓a-ha č	ƛ̓in̓a-ha č	ƛ̓ɛ́ʔnahàčʰ	*I have oolichan oil*
e.	q̓g̓a-ha č	q̓əʔga-ha č	q̓áʔgahačʰ	*I've got my cane*

f.	watla-ha č	watla-ha č	wátlahač^h	*I have a sweetheart*
g.	k̓^{w}uta-ha č	k̓^{w}uta-ha č	k̓^{w}útahàč^h	*I've got a barbecue stick*
h.	tala-ha č	tala-ha č	tálahàč^h	*I've got money*

6.1.2.2 Consonant-final stems

When the stem ends in a consonant, the possessive affix -hV is Aligned to the right edge of the stem-final vowel, and the final consonant of the stem follows the suffix: /...VC-hV/ → [V-hV-C]. On the surface, the possessive affix appears to be "infixed". This suffix is mis-aligned with the edge of the stem by a *single* consonant, as shown by the data in (7). Recall that č is the 1sg subject clitic *I* and is therefore not considered part of the stem.

(7) Consonant-final stems

	Input	**Position of -hV-**	**Output**	**Gloss**
a.	nx^{w}iL-hV	nəx^{w}i-hi-ɬ	núx^{w}ehɛ̀ɬ	*He has a canoe*
b.	ʔayaʔ-hV	ʔaya-ha-ʔ	ʔáyɛhàʔ	*He's got a house*
c.	ʔimin-hV	ʔimi-hi-n	ʔɛ́me·hɛ̀n	*It's got a door*
d.	t̓in-hV č	t̓i-hi-n č	t̓ɛ́hɛnč^h	*I've got b. fish*
e.	ʔatnupil-hV č	ʔatnupi-hi-l č	ʔátnope·hèlč^h	*I have a car*
f.	ʔawuk^w-hV č	ʔawu-hu-k^w č	ʔʌ́wohòk^{w}č^h	*I have tobacco*
g.	pun-hV č	pu-hu-n č	púhonč^h	*I have a spoon*
h.	mimaw̓-hV č	mima-ha-w̓ č	mɛ́·mahàw̓č^h	*I've got a cat*

6.1.2.3 Stems ending in a consonant cluster

Now consider what happens to stems which end in a consonant cluster. The possessive affix is mis-aligned by a single consonant at the right-hand edge of the stem domain, *and* the vowel [i] is epenthesized before the affix, as shown by the data in (8).

(8) Final CC clusters and [i] epenthesis

	Input	Position of -hV	Output	Gloss
a.	y̌anxʷ-hV č	y̌an[i]-hi-xʷ č	y̌ɛ́nehɛ̀xʷčʰ	*I've got a fish*
a'.		*y̌a-ha-nxʷč		
a''.	y̌anxʷ	y̌anxʷ	y̌ɛ́nxʷ	*fish*
b.	saɬtxʷ-hV	saɬt[i]-hi-xʷ	sáɬte·hɛ̀xʷ	*He has a wife*
b'.		*saɬ-ha-txʷ		
b'.		*sa-ha-ɬtxʷ		
b''.	saɬtxʷ		sáɬtxʷ ~ sáɬtw̥	*woman*
c.	t̓ᶿay=tn-hV	t̓ᶿayt[i]-hi-n	t̓ᶿáytehɛn	*have an umbrella*
c'.		*t̓ᶿa-ha-ytən		
c''.	t̓ᶿay=tn		t̓ᶿáytən	*umbrella*
d.	θkʷ=nač=tn-hV č	θəkʷnačt[i]-hi-n č	θʊ́kʷnʌčtè:hɛ̀nčʰ	*I've got a chair*
d'.		*θəkʷna-ha-čtən		
d''.	θkʷ=nač=tn	θəkʷnačtən	θʊ́kʷnʌčtən	*chair*
e.	tm̓=us=tn-hV	təʔmust[i]-hi-n	táʔmɔstèhɛn	*have a headband on*
e'.		*tam̓u-hu-stən		
e''.	tm̓=us=tn	təm̓ustən	táʔmɔstən	*headband*
f.	ɬay=nač=tn-hV	ɬaynačt[i]-hi-n	ɬáynʌčtèhɛn	*have a skirt on*
f'.		*ɬayna-ha-čtən		
f''.	ɬay=nač=tn	ɬay=nač=tən	ɬáynačtən	*skirt*

Notice that the possessive suffix -hV is not mis-aligned by two (or more) consonants, as shown by the ungrammatical examples in (8.a'-f'). In fact, the possessive suffix needs to be aligned as close to the right-edge of the stem as possible, and may only be mis-aligned by a single consonant. In addition, the possessive suffix is always preceded by a vowel. The examples in (8) above show that vowel epenthesis occurs in order to ensure that a vowel precedes this suffix. The vowel in each case is the full vowel [i]. Schwa is not epenthesized in this context, as shown by the ungrammatical examples in (9.a-f).

(9)

	Input	[i] epenthesis	*ə-epenthesis	Gloss
a.	J̌anxʷ-hV č	J̌an[i]-hi-xʷ č	*J̌a . n[ə] . hVxʷ	*I've got a fish*
b.	saɬtxʷ-hV	saɬt[i]-hi-xʷ	*saɬ . t[ə] . hVxʷ	*He has a wife*
c.	t̓ᶿaytn-hV	t̓ᶿayt[i]-hi-n	*t̓ᶿay . t[ə] . hVn	*have an umbrella*
d.	θkʷ=nač=tn-hV č	θəkʷnačt[i]-hi-n č	*θə́kʷnač . t[ə]. hVn č	*I've got a chair*
e.	tm̓=us=tn-hV	təʔmust[i]-hi-n	*tə́ʔmus . t[ə]. hVn	*have a headband on*
f.	ɬay=nač=tn-hV	ɬaynačt[i]-hi-n	*ɬáynač . t[ə]. hVn	*have a skirt on*

Furthermore, the vowel of the possessive suffix harmonizes with the immediately preceding, full vowel, as shown in §6.1.1.1 above. If schwa were epenthesized as in (9) Column 3, the harmonic features would have to spread from some other source onto the vowel of the possessive suffix -hV since schwa is a bare Nucleus with no inherent features, as argued in Chapters 2.

Since [i] is epenthesized, the vowel quality of the possessive affix harmonizes with this preceding epenthetic vowel [i]. This means that stems with final /i/ neutralize on the surface with stems with a final consonant cluster with the addition of the possessive suffix. The related non-possessed stems are provided in parentheses in order to show whether or not the [i] is an inherent part of the stem or epenthesized in order to provide a full vowel nucleus.

6.1.2.4 Analysis of the Position of the Possessive Affix

A formal analysis of the position of the Possessive affix in Sliammon must capture a number of descriptive facts:

(10)

- The possessive affix is always preceded by a full vowel
- After V-final stems, the possessive affix /-hV/ is a suffix
- After C-final stems, the possessive affix /-hV/ is infixed

- It can be misaligned by *one and only one* consonant

McCarthy and Prince (1993: Chapter 7) provides a description and analysis of a number of similar cases. For example, Ulwa, a language of the Atlantic coast of Nicaragua, shows similar properties in which the possessive marker is sometimes a suffix and sometimes an "infix" (M&P 1993:105). The formal analysis draws on constraint interaction in which a prosodic constraint (or constraints) **P** is ranked above a morphological constraint (or constraints) **M** following the general schema in (11):

(11) P >> M

The prosodic constraint (P) defines the prosodic base of affixation and functions as a constraint on the prosody/morphology interface, "demanding that the affix be preceded or followed by a phonological string of a particular type" (M&P 1993: 108). The tension in the grammar arises by conflict with a morphological (M) constraint Leftmost or Rightmost (instances of Edgemost) which characterize prefixing or suffixing (cf. (12) below for the formalization of Rightmost in terms of an Align constraint). The effects of the prosodic constraint will only be felt if it is ranked above the morphological constraint in keeping with the schema in (11). Consider an extension and application of the analysis and ideas developed in M&P (1993) to an analysis of the Sliammon possessive -hV morpheme.

Consider the constraints needed for an analysis of the possessive affix in Sliammon. It is claimed here that this affix is basically a suffix, and as such is subject to the morphological constraint Edgemost (R, -hV), referred to informally as RIGHTMOST POSS. The Align version of this constraint is provided in (12).

RIGHTMOST POSS:

(12) ALIGN (-hV, L ; Stem, R)

The left-edge of the possessive morpheme -hV is aligned with the right-edge of the stem; it is a suffix.

If the align constraint RIGHTMOST POSS were undominated, then the possessive marker in Sliammon would always surface as a suffix. Notice however that this is not always the case, as noted above. In particular, it is infixed when it follows C-final stems. There is one condition, however, which seems to hold of all surface forms: the possessive affix -hV in Sliammon is always preceded by a full vowel. Consider then the phonological (**P**) constraint which captures this generalization. Since the prosodic constraint needs to refer to authentic units of prosody, following M&P (1993:32), it is formulated in terms of the following Alignment constraint.

(13) ALIGN POSS-to-NUCμ

Align (-hV, L ; Nucμ, R)

The left-edge of the possessive morpheme is aligned with the right-edge of a full vowel.

This interface constraint ensures that the left-edge of the affix -hV is aligned with the right-edge of a nuclear mora (i.e. a full vowel). This phonological constraint therefore defines the base of affixation, and delimits possible affixation sites. Consider the following tableau which shows how the morphological constraint RIGHTMOST POSS interacts with the Alignment constraint: ALIGN POSS-to-NUCμ.

(14) Possessive -hV with Consonant-final stems

Input: /t̓in-hV/	ALIGN POSS-to-NUCμ	RIGHTMOST POSS
☞ a. t̓i-hV-n		*
b. t̓in-hV	*!	

The tableau in (14) shows that the optimal candidate (14.a) violates the constraint RIGHTMOST POSS minimally in order to satisfy the high-ranked phonological constraint (Align-to-Nucμ) which aligns this affix with the right-edge of a full vowel. The possessive affix is mis-aligned in order to satisfy this higher-ranking phonological constraint. Candidate (14.b) is less optimal since it violates the high-ranking ALIGN constraint. The interaction between these two constraints therefore ensures that the possessive affix is "infixed" after C-final stems.

Now consider how this constraint ranking affects the position of the possessive affix with V-final stems.

(15) Possessive -hV with Vowel-final stems

Input: kapu-hV	ALIGN POSS-to-NUCμ	RIGHTMOST POSS
☞ a. kapu-hV		
b. kap-hV-u	*!	*
c. ka-hV-pu		*!*

The optimal candidate in (15.a) satisfies both constraints since the left-edge of the affix is aligned with the preceding full vowel and -hV is a suffix. Mis-alignment of the affix by infixing it into the stem creates unnecessary constraint violations, thus ruling out candidates (15.b-c).

Now consider the analysis of the cases which end in a consonant cluster. Recall that these cases involve [i] epenthesis in order to provide a vowel preceding the affix. Since [i] is epenthesized rather than either [u] or [a], the cost associated with [i]-epenthesis must be less than the cost associated with epenthesis of either of the other full vowels. This motivates the partial ranking in (16).

(16) DEP[u] , DEP[a] >> DEP[i].

These constraints on vowel-epenthesis are ranked below the ALIGN constraints, as shown by the tableau in (17). The phonological constraint ALIGN POSS-to-NUCμ and the morphological constraint RIGHTMOST POSS govern the surface position of the -hV affix.

(17) The position of the Possessive affix with CC-final stems

Input: ǰanx^w-hV	ALIGN POSS-to-NUCμ	RIGHTMOST POSS	DEP[a], DEP[u]	DEP[i]
☞ a. ǰan[i]-hi-x^w		*		*
b. ǰanx^w-hV	*!*			
c. ǰan-hV-x^w	*!	*		
d. ǰa-ha-nx^w		**!		
e. ǰa-ha-n[i]x^w		**!*		*
f. ǰan[a]-ha-x^w		*	*!	
g. ǰan[u]-hu-x^w		*	*!	

Consider why [i] epenthesis does not occur in C-final forms like those in (7) above. The relative ranking of DEP[i] with respect to RIGHTMOST POSS ensures that misalignment is minimal and that vowel epenthesis does not occur unless it is driven by a higher-ranking constraint, as in (18)

(18)

Input: t̓in-hV	ALIGN POSS-to-NUCμ	RIGHTMOST POSS	DEP[i]
☞ a. t̓i-hV-n		*	
b. t̓in-hV	*!		
c. t̓in][i]-hV		*!	*

Another question which is central to this thesis is why schwa epenthesis does not occur in CC-final stems? What rules out the surface forms in (9) Column 3 above? There seem to be potentially two constraints which conspire to prevent this as an optimal output form. First, epenthesis of schwa involves epenthesis of a bare Nucleus and therefore would not provide the phonological features required in order to satisfy the constraints on translaryngeal harmony. In addition, the way in which the ALIGN constraint is formalized, entails alignment to a vocalic head which is both Nuclear and moraic. Since schwa is Nuclear but non-moraic, [ə] epenthesis fails to satisfy the ALIGN constraint.

In addition, this raises another related question; the central claim throughout this thesis is that schwa does not optimally occur in a stressed open syllable. The question is whether or not it ever occurs in an unstressed open syllable? Given the defective distribution of schwa and the surface patterns discussed in §2, schwa does not seem to occur in this position either.

6.2 Implications: Non-reduplicative C- Prefixes in Sliammon

Sliammon is typically characterized as a language which has lost all non-reduplicative C-prefixes due to the constraint against word-initial consonant clusters in the language (J.Davis 1970, Blake 1999). This is attributed to fixed word-initial stress, and the influence of neighbouring Wakashan languages. Section 6.2.1 provides historical comparative evidence for the loss of the common pan-Salish nominalizing prefix s- in Sliammon, and provides an account of why this single C- prefix does not surface.

Section 6.2.2 provides evidence for the existence of an /L'-/ plural marker in Sliammon. Although this morpheme always appears "infixed" within the stem domain, it is aligned as closely as possible with the left-edge of the stem. Since mis-alignment is always limited to a single consonant, this morpheme displays classic characteristics of a prefix (cf. McCarthy and Prince 1994). This is particularly interesting given that Sliammon is usually characterized as the only Salish language which lacks non-reduplicative prefixes (cf. Kroeber 1999:11-13). Although the Plural /L'-/ morpheme always surfaces as an "infix", it is claimed here that it has the basic properties of a non-reduplicative C- prefix. The question then is why does the s-nominalizing prefix systematically undergo deletion whereas the Plural /L'-/ prefix is consistently misaligned?

6.2.1 Loss of the Lexical Nominalizing prefix s- in Sliammon

This first case deals with the loss of the lexical nominalizing prefix s- in Sliammon.

6.2.1.1 Comparative Evidence

One of the striking properties of Sliammon is the absence of the lexical nominalizing prefix s- which is found in all of the other Salish languages (cf. Davis 1970:15, Blake 1992, Kroeber 1999:11-13). Compare the Sliammon (Sl) and Sechelt (Se) forms in (19) which show the absence of this widespread prefix in Sliammon (data set cited in Blake 1992). The Sechelt data are cited from Beaumont (1985), abbreviated RCB, in the orthographic form presented there, and represented within angled brackets. A phonetic representation consistent with the conventions adopted in the present work is given in the Output column.

(19)

	Proposed Input	Output	Gloss	Source
a.	nxʷiɬ	nʊ́xʷɩɬ	*dugout canoe*	Sl
a'.	<snéxwílh>	snə́xʷɩ́ɬ	*canoe*	Se RCB 1985:25
b.	q̓ʷy̓x̌	q̓ʷʌ́y̓x̌ ~ q̓ʷéy̓ᵊx̌	*firewood*	Sl
b'.	<sk̲w'éyex̲>	sq̓ʷə́yɩx̌	*firewood*	Se RCB 1985:153
c.	x̌ʷəs	x̌ʷʌ́s	*animal fat, lard*	Sl
c'.	<sx̲wes>	sx̌ʷə́s	*grease*	Se RCB 1985:276
d.	tumiš	túmɩš	*man*	Sl
d'.	<stúmish>	stómɩš	*man*	Se RCB 1985:24

Sliammon also lacks other non-reduplicative consonantal prefixes (C-) often found in other Salish languages. The reader is referred to (Beaumont (1985:184, fn. 30) on the xʷ- prefix in Sechelt; van Eijk (1997:48-53) on Lillooet; Suttles (in press) on Musqueam (hən̓q̓əmin̓əm̓) Salish; Kinkade (1991: 365) on Upper Chehalis, amongst others, for examples of C- prefixes in other Salish languages. Kroeber (1999:11-13) includes general discussion and additional references.

6.2.1.2 Discussion and Proposed Analysis

It is argued here, following Blake (1999), that the lack of non-reduplicative single C-prefixes follows from (i) the constraint on stressed schwas in open syllables ($*ə́]_{\sigma}$), and (ii) from the undominated interface constraint which requires that the left-edge of the Prosodic Word be aligned with the left-edge of the morphological Stem. The discussion will focus on the s-nominalizing prefix.

Reduplicative prefixes (Diminutive, Plural ; Imperfective, and Characteristic) are within the domain of stem-formation in Sliammon, as well as within the domain of the Prosodic Word since they receive primary stress in word-initial position, as shown by the data in (20).

(20)

	Input		Output	Gloss
a.	x̌ʷil̓m	x̌ʷiʔləm	x̌ʷɛ́ʔᵊlʌm	*rope*
a'.	DIM-x̌ʷil̓[-i-]m+[ʔ]	x̌ʷi-x̌ʷlim̓	x̌ʷɛ́x̌ʷlɛm̓	*string, thread*
b.	ƛ̓l̓aq̓n	ƛ̓əʔlaq̓ən	ƛ̓áʔᵊlaq̓ʌn	*slug*
b'.	CəCPL--ƛ̓l̓aq̓n	ƛ̓əl-ƛ̓əʔlaq̓ən	ƛ̓ílƛ̓aʔᵊlàq̓ʌn	*lots of slugs*
c.	t̓in	t̓in	t̓ɛ́n	*barbecued fish*
c'.	IMP-t̓in-ʔm	t̓i-t̓inʔəm	t̓ɛ́t̓ɛnʔəm	*barbecuing fish*
d.	ɬx̌	ɬəx̌	ɬʌ́x̌	*bad*
d'.	CH-ɬx̌+[i]	ɬəx̌-ɬ[i]x̌	ɬʌ́x̌ɬɛx̌	*weak*

Non-reduplicative prefixes are hypothesized to be outside of the domain of morphological stem formation in most other Salish languages (Czaykowska-Higgins and Kinkade 1997:25; Czaykowska-Higgins 1997:153-195 on Moses-Columbia Salish (Nxaʔamxcín)). Consider what would happen if a non-reduplicative s- prefix were posited in the Input form.

If an s- nominalizing prefix were posited in the Input then the surface constraint in the grammar would militate against surface realization of that prefix at the cost of underparsing the features associated with /s- /. This means that Align L PrWd, *Complex Onset, $*\acute{ə}]_\sigma$ are both ranked higher than MAX[s]-Affix, as in (21).

(21)

ALIGN L PrWd, *COMPLEX ONSET, $*\acute{ə}]\sigma$ >> MAX[s]-Affix

The tableau in (22) shows the evaluation of the candidates.

(22)

Input: s-CVCV	ALIGN L PrWd	COMPLEX ONSET	$*\acute{ə}]\sigma$	MAX[s]-Affix
☞ a. Cv́ . Cv				*
b. s . Cv́ . Cv	*!			
c. . sCv́ . Cv	*!	*		
d. sə́ . Cv . Cv	*!		*	
e. C[s-]v́ . Cv		*!		
f. Cv́[s-]. Cv				

Notice that the optimal candidate in (22.a) violates MAX[s]-Affix where each of the other candidates is ruled out by violation of a higher-ranking constraint. The period marks a syllable boundary. The presence of the s-nominalizing prefix in candidate (22.c) is ruled out by the high-ranking constraint which ensures that the left-edge of the Prosodic Word is aligned with the left-edge of the stem. Since non-reduplicative prefixes are located outside of the stem domain, the presence of the initial s- creates a violation of this constraint. Candidate (22.c) also violates the constraint against Complex Onsets in the language. Epenthesis of schwa in order to try and save this prefix, as in (22.d) is also ruled out. Not only does this candidate violate Alignment, but it also violates the constraint $*\acute{ə}]_{\sigma}$. Candidates (22.e-f) are both ruled out since they violate Contiguity of the Root without improving the resultant output. These candidates involve attempts to "infix" the s-prefix in order to parse this morpheme. Although this is non-optimal in the case of s-, it will be argued in the next section that this is optimal in the case of the Plural /L'-/ morpheme.

6.2.2 /L'-/ Plural

In this section, I would like to reconsider C_1VʔV- and C_1VʔVC_2- reduplication proposed in Watanabe (2000:243-246) and suggest that these "prefixes" are comprised to two separate morphemes: a reduplicative prefix and a plural marker: /L'-/ which has a least three different phonologically conditioned allomorphs: [-iʔ- ~ -uʔ- ~ -aʔ-], and is basically "prefixal" in nature. The section is organized as follows. First independent evidence is presented for the existence of a plural /L'-/ affix in Sliammon (distinct from the plural -ʔVg suffix). Historical and comparative evidence is provided in order to provide a background for the existence of such an affix in Sliammon, and to place it within the broader Coast Salish context. The final four sections show that the plural morpheme /L'-/ can co-occur with Diminutive, Diminutive Plural, Imperfective and Characteristic reduplication thus explaining the difficulty Watanabe (2000) experiences in determining a consistent meaning for C_1VʔV- and C_1VʔVC_2- reduplication.

The plural prefix /L'-/ is always minimally misaligned in order to satisfy the Alignment constraint which ensures that the left edge of the Prwd is aligned with the left-edge of the morphological stem. /L'-/ vocalizes and surfaces as [iʔ, uʔ, aʔ]. Since /L'/ represents a set of features which can function as the head of the syllable, the misalignment of /L'-/ results in its constituting the initial syllable nucleus.

Plural Infix

Consider the following pairs of related words which show that a -Vʔ- "infix" indicates plurality. Notice that this infix always occurs after the left-most consonant in the word.

(23)

	Input	Position of [affix]	Output	Gloss
a.	piʔ-it	piʔit	pɛ́ʔɛt	*stuck together*
a'.	[L’]+piʔ-it	p[iʔ]iʔit	pɛ́ʔɛʔɛt	*really stuck together*
b.	ǰaǰ̓a	ǰaʔǰa	ǰɛ́ʔǰɛ	*relative*
b'.	[L’]+ǰaǰ̓a	ǰ[aʔ]aǰaʔ	ǰɛ́ʔaǰɛʔ	*relations* [2]

6.2.2.1 Historical Comparative Evidence

The plural l-infix [əl ~ ʔlə] is well documented in a number of other closely related Coast Salish languages such as Halkomelem (Cowichan and Musqueam dialects), and Saanich. Below I present comparative evidence from Saanich drawing on the research of Montler (1986:105) who states that the [l] infix "is by far the most common form of the plural." In words which consist of only a (C)CVC syllable in Saanich, the infix [ʔlə] appears after the stressed vowel in order to indicate the plural, as shown by the examples in (24).

(24) **Saanich (North Straits Salish)** (data Montler 1986: 106)

	Position of [affix]	Gloss	Root	Source
a.	st̓θá[ʔlə]m̓	*bones*	(cf. √t̓θam̓)	Sa
b.	sčá[ʔlə]ɬ	*lots of wood*	(cf. √čaɬ)	Sa
c.	sá[ʔlə]ɬ	*roads, doors*	(cf. √saɬ)	Sa
d.	ná[ʔlə]s	*they're fat*	(cf. √nas)	Sa

[2]This was extracted from the following phrase: ʔətθ ǰaʔaǰaʔ [ʔʌ́tθ ǰɛ́ʔaǰɛʔ] *All my relations.*

In longer forms, the infix is [-əl-] is placed immediately after the first consonant of the Root, as shown by the Saanich data in (25). The left-edge of the Root is indicated here by the symbol √.

(25) **Saanich (North Straits Salish)** (data Montler 1986:105-106)

	Position of [affix]	**Gloss**	**Related word**		**Source**
a.	s√ʔ[əl]áθ=əs	*faces*	sʔáθəs	*face*	Sa
b.	√š[əl]p=ə́qs-t	*He sharpened some points*	špə́qst	*He sharpened it*	Sa
c.	s√ɬ[əl]p̓=áθən	*lips*	sɬp̓áθən	*lip*	Sa
d.	√s[əl]éq-əɬ	*They're outside*	séqəɬ	*He's outside*	Sa
e.	√m[əl]áay̓	*baskets*	máay̓	*basket*	Sa
f.	√ŋ[əl]íq̓-ən	*masts*	ŋíq̓ən	*mast*	Sa

Montler (1986: 107) also documents the [əl] form with reduplicative prefixes, as shown by the data in (26).

(26) Saanich (North Straits Salish)

	Position of [affix]	**Gloss**	**Morpheme Gloss**	**Source**
a.	k̓ʷ[əl]ə+√k̓ʷəw̓yəkʷ	*little fishhooks*	DIM[PL]+√fishhook	Sa
b.	s-t[əl]á+√tələw̓	*creeks*	s-DIM, ACT[PL]+√river	Sa
c.	k̓ʷ[əl]ə+√k̓ʷátəʔ	*crows*	DIM[PL]+√raven	Sa
d.	s-qʷ[əl]ə́l̓+√qʷəl̓	*several stories*	s-CHAR[PL]+√speak	Sa

This is the same position occupied by the /L'-/ infix in the Sliammon reduplicative examples which will be discussed in (§6.2.2.3 - 6.2.2.6).

From a historical/comparative perspective l̓ə [ʔlə] in Saanich corresponds to /L'/ [y̓ ~ w̓ ~ aʔ] in Sliammon. The development of Proto Salish *l̓ is summarized in (84) drawing on historical/comparative research by Swadesh (1952), and Harris (1981 for Island Comox). The Proto Salish development of PS *l to y ~ w in Sliammon is well attested in the historical comparative literature (cf. Thompson (1979), Kuipers (1981-82), Kinkade (class notes), and

Kroeber (1999), for example). What is less well understood is the development of PS *l̓ to ʔa ~ aʔ in the environment of the low vowel a (cf. Blake 1992).

(27) Development of Proto-Salish *l̓ in Sliammon

PS *l̓	>	w̓	in the environment of a round vowel: u/o
	>	ʔ	in the environment of the low vowel: a
	>	y̓	elsewhere

Within the synchronic grammar of the language, the sound (collocation of features) which shows this range of surface alternation is represented by the symbol /L'/, since it exhibits the alternations characteristic of /L'-/ (cf. §2.2 and Appendix IV). What is here posited as the plural /L'-/ does not surface as [ɬ] since it never occurs word-finally, but does show alternations between [y̓ ~ w̓ ~ aʔ ~ ʔa] all of which are characteristic of /L'/ and can not be attributed to /y̓/, /w̓/, or /aʔ/ in the contexts in which they occur.

6.2.2.2 Synchronic evidence in Sliammon

This section provides synchronic evidence for [y̓ ~ w̓ ~ aʔ] alternations in Sliammon. Perhaps the best examples come from a detailed investigation of the numbers *one* and *two* and the related words which are derived from these roots.

(28)

	Input		**Output**	**Gloss**
a.	paL'	paʔa	páʔa	*one*
a'.	saL'	saʔa	sáʔa	*two*
b.	paL'=agiɬ	paʔagiɬ	páʔagɩɬ	*one boat, canoe*
b'.	saL'=agiɬ	saʔagiɬ	sáʔagɩɬ	*two boats, canoes*
c.	paL'=us	paw̓us	páwʔus	*one dollar*
c'.	saL'=us	saw̓us	sáwʔus	*two dollars*
c''.	DIM-saL'=us	sa-sw̓us	sʌ́suʔus	*two sm. round things*

d. CəCPL-paL' (pəL-paL')   pəy-paʔa   pé:paʔa   *one person* [3]

d'. CəCPL-saL' (səL-saL')   səy-saʔa   sɛ́:saʔa   *two people*

(29) Distribution of /L'/

ʔ   in the environment of the low vowel: a

ẃ   in the environment of a round vowel: u/o

ẏ   elsewhere

Notice that ẏ and ẃ surface as [ʔi ~ iʔ] and [ʔu ~ uʔ] respectively. This /L'/ infix is clearly distinct from the -'Vg plural suffix (cf. Watanabe 2000 for discussion of the -(ʔ)Vg plural).

6.2.2.3 Plural Infix and Diminutive Reduplication

Given both the synchronic and diachronic evidence for the existence of a plural /L'-/ affix in Sliammon, it is proposed here that what Watanabe identifies as the CVʔV- prefix, which indicates diminutive plurals, consists of two morphemes: the plural /L'-/ morpheme and the CV- diminutive prefix, as indicated schematically in (30) and illustrated by the data in (31). The + sign is used between the Plural /L'-/ and the first element of the stem in order to highlight the non-concatenative nature of this affix.

(30) PLURAL[L'-] + DIM - Root

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[3]Notice that the present analysis does away with the need to suggest that there is a separate reduplicative pattern Ci/Ci:- in order to account for these plural forms. They are exactly what is expected of /L'-/ in the phonological context in which it occurs: pəL-paL' > pəy-paʔa > [pé:paʔa] one person. Glottalization associated with /R'/ is systematically lost within the CəC- reduplicative prefix, as documented by Blake (1992, 1995) and Watanabe (1994).

The plural infix /L'/ is realized as y̓ [-iʔ-] after the initial consonant and before the vowel i, as shown by the diminutive plural forms in (31).

(31) **Plural Infix:** /L'/ y̓ [ɛʔ ~ eʔ ~ iʔ]

	Input	Position of [affix]	Output	Gloss
a.	tiqiw	tiqiw	tɛ́qɛw	*horse*
a'.	DIM-tiqiw+[ʔ]	titqiw̓	tɛ́tqɛw̓	*small horse*
a".	[L']+DIM-tiqiw	t[y̓]i-tqiw	tɛ́ʔɛtqɛ̀w	*small horses*
b.	č̓ɬ	č̓əɬ	č̓íɬ	*rain*
b'.	[L']+DIM-č̓ɬ=ukʷt+[i]	č̓[y̓]i-č̓ɬ=ukʷ[i]t	č̓íʔɩč̓ɬòkʷɩt	*lots of little raincoats*
c.	pukʷ	pukʷ	púkʷ	*book*
c'.	DIM-pukʷ	pi-pukʷ	pépukʷ	*little book*
c".	DIM-PL-pukʷ	pi-pəkʷ-pukʷ	pépʊkʷpùkʷ	*lots of small books*
c'".	[L']+DIM-pukʷ=uɬ	p[y̓]i-pukʷ=uɬ	péʔɛpùkʷʊɬ	*lots of little books*
d.	t̓ᶿit̓ᶿik̓ʷ	t̓ᶿit̓ᶿik̓ʷ	t̓ᶿét̓ᶿek̓ʷ	*worm*
d'.	[L']+DIM-t̓ᶿit̓ᶿik̓ʷ	t̓ᶿ[y̓]i-t̓ᶿ[a]t̓ᶿik̓ʷ	t̓ᶿɛ́ʔɛt̓ᶿa·t̓ᶿɛ̀k̓ʷ	*small worms*

Contrast this with the data in (32) which shows that the plural infix /L'/ is realized as w̓ [-uʔ-] in the environment of a round vowel.

(32) **Plural Infix:** /L'/ -w̓- ~ -uʔ- [oʔ ~ w̓]

	Input	Position of [affix]	Output	Gloss
a.	DIM-x̣̌uqʷ-it	x̣̌u-x̣̌qʷit	x̣̌óx̣̌qʷɛt	*spotted*
a'.	[L']+DIM-x̣̌uqʷ-it	x̣̌[w̓]u-x̣̌qʷit	x̣̌óʔox̣̌qʷɛt	*patches, little spots*
b.	mušmuš	mušmuš	múšmuš	*cow*
b'.	[L']+DIM-mušmuš	m[w̓]u-mšmuš	móʔomšmùš	*little cows*
c.	ɬuk̓ʷ	ɬuk̓ʷ	ɬúk̓ʷ	*fly*
c'.	IMP-ɬuk̓ʷ	ɬu-ɬuk̓ʷ	ɬúɬuk̓ʷ	*flying*
c".	[L']+DIM-ɬuk̓ʷ	ɬ[w̓]u-ɬk̓ʷ	ɬóʔoɬk̓ʷ	*a plane*

The choice of either the -ẏ- and -ẇ- allomorphs of the plural infix /L'/ is determined by the following vowel and reflects the historical sound changes discussed in (27). Note also that the plural /L'/ infix occupies the position immediately following the first consonant of the stem, and therefore accords well with the Saanich and Halkomelem data. Consider the data in (33) which shows that /L'/ is realized as [-aʔ-] before the low vowel a.

(33) **Plural Infix:** /L'/ [-aʔ-]

	Input	**Position of [affix]**	**Output**	**Gloss**
a.	q̓ʷat-m	q̓ʷatəm	q̓ʷátəm	*river*
a'.	DIM-q̓ʷat-m+[i]+[ʔ]	q̓ʷa-q̓ʷtim̓	q̓ʷáq̓ʷtɛm̓	*creek*
a''.	[L']+DIM-q̓ʷat-m+[i]+[ʔ]	q̓ʷ[aʔ]a-q̓ʷtim̓	q̓ʷáʔaq̓ʷtɛm̓	*creeks (dim. pl.)*

Notice that the presence of diminutive reduplication triggers deletion of the Root vowel as discussed independently in Davis (1970), Kroeber (1989), Blake (1992, 1999, in prep.), Watanabe (1994, 2000).

Predictions

If [-iʔ-, -uʔ-, -aʔ-] are phonologically conditioned allomorphs of the plural morpheme /L'-/, and add plural semantics to the above diminutive forms as proposed above, then one expects this infix to co-occur with other Roots and stems, adding plural or augmentative semantics in these cases as well. Consider the range of reduplicative data presented below which provides support for this position.

6.2.2.4 Plural Infix and Diminutive Plural Reduplication

The following example shows that the plural /L'-/ affix can also co-occur with roots/stems which have undergone diminutive plural reduplication, and is translated as 'lots of little bits of ....'. Diminutive Plurals are doubly reduplicated forms (Ci-CəC) in which the Diminutive morpheme precedes the CəC reduplicant (cf. Blake 1992, Watanabe 1994; Urbanczyk (199x) on Lushootseed). The plural /L'/ occurs immediately after the stem-initial consonant, in this case after the initial consonant of the diminutive reduplicant, as shown by (35.a''').

(34) PLURAL[L'-] + DIM - CəC$_{PL}$ - Root

(35)

	Input	Position of [affix]	Output	Gloss
a.	saplin	saplin	sáplɛn	*bread*
a'.	PL-saplin	səp-saplin	sə́psaplɛn	*lots of bread*
a''.	DIM-saplin	sa-splin	sásp^{ə}lɛn	*little bit of bread*
a'''.	[L']+DIM-PL-saplin	s[y̓]i-səp-saplin	sɛ́ʔɛsəpsàplɛn	*lots of little bits of bread*

6.2.2.5 Plural Infix and Imperfective Reduplication

The plural /L'/ infix also co-occurs with Imperfective reduplication, as shown by the data in (37).

(36) PLURAL[L'-] + IMP - Root

(37)

	Input	Position of [affix]	Output	Gloss
a.	t̓ᶿq̓-ʔm	t̓ᶿəq̓ʔəm	t̓ᶿʌ́q̓ʔʌm	*throw (s.t.)*
a'.	[L']+IMP-t̓ᶿq̓-ʔm	t̓ᶿ[y̓]ə-t̓ᶿq̓aʔəm	t̓ᶿɛ́ʔɛt̓ᶿq̓àʔʌm	*throwing (lots)* [4]

[4]The example given by the consultant is that you would use this if you were throwing more than one rock, throwing lots of rocks. Do note that the predicate is formally intransitive as indicated by the presence of the Active Intransitive marker /ʔm/; however, the implied object (expressed overtly by a NP preceded by the oblique marker ʔə) can be singular or plural.

b. ym-t	yəm-t	yɩ́mt	*kick it*
b'. [L']+IMP-ym-ʔm	y[y̓]ə-ym-a-ʔəm	yíʔimàʔəm	*soccer game*
b''. [L']+IMP-ym-ʔm	y[y̓]-ym-a-ʔəm	yíʔimàʔəm	*soccer game*
c'. [L']+IMP-ƛ̓iqʷ-ʔm	ƛ̓[y̓]i-ƛ̓qʷ-a-ʔəm	ƛ̓ɛ́ʔɛƛ̓qʷàʔəm	*playing catch*
d. nš-m	nəš-əm	nɩ́šəm	*swim*
d'. [L']+IMP-nš-m	n[y̓]ə-nšəm	níʔɩnšɩm	*they're swimming*
e. x̌ʷǰ-t	x̌ʷəyt	x̌ʷéyt	*stretch it*
e'. [L']+IMP-x̌ʷǰ-t-as	x̌ʷ[y̓]ə-x̌ʷǰatas	x̌ʷɛ́ʔɛx̌ʷǰɛ̀tʌs	*s/he is stretching it*
f. x̌ʷay-m	x̌ʷayəm	x̌ʷáyɩm	*to dive*
f'. IMP-x̌ʷay-m+ʔ	x̌ʷa-x̌ʷyɩm̓	x̌ʷáx̌ʷyɩm̓	*diving*
f''. [L']+IMP-x̌ʷay-m+ʔ	x̌ʷ[aʔ]a-x̌ʷyəm̓	x̌ʷáʔʌx̌ʷyɩm̓	*diving many times*
g. ǰƛ̓	ǰəƛ̓	ǰɩ́ƛ̓	*run*
g'. [L']+IMP-ǰƛ̓	ǰ[aʔ]a-ǰəƛ̓	ǰɛ́ʔaǰɩƛ̓	*they're running*

The plural infix may co-occur with diminutive and imperfective reduplication to give a reading such as: *raining a little bit, sprinkling, drizzling*.

(38) PLURAL[L'-] + DIM - IMP - Root

Data exemplifying this morphological collocation follow:

(39)

Input	Position of [affix]	Output	Gloss
a. č̓ɬ	č̓əɬ	č̓ɩ́ɬ	*rain*
a'. IMP-č̓ɬ	č̓ə-č̓ɬ	č̓ɩ́č̓ɬ	*it's raining*
a''. [L']+DIM-IMP-č̓ɬ	č̓[y̓]i-č̓i-č̓əɬ	č̓íʔič̓ič̓ɩɬ	*raining a little bit*

6.2.2.6 Plural Infix and Characteristic Reduplication

The plural infix /L'/ also co-occurs with Characteristic reduplication. Example (40.a') was described as meaning *calm for a long time* (constant over a period of time; e.g. it's been calm for a week/month now).

(40)

a.	mƛ̓-mut	məƛ̓mut	mʌ́ƛ̓mot	*very calm (on water)*
a'.	[L']+CH-mƛ̓	m[aʔ]aƛ̓-məƛ̓	máʔaƛ̓məƛ̓	*calm for a long time*

The combination of Characteristic reduplication and plural infixation seems to account for the C_1VʔVC_2- forms cited in Watanabe (2000:246). I have retranscribed Watanabe's data to conform to the transcription system and representations adopted in this work and present this data in (41). Crucially the surface sequence C_1VʔVC_2- is proposed here to be composed of two morphemes: Characteristic reduplication and the plural /L'-/ prefix. Notice that the examples involve weak CəC Roots and Characteristic reduplication which appears to involve a CaC- prefix. The plural morpheme /L'-/ is realized as [aʔ] before an adjacent [a].

(41) data cited from Watanabe (2000: 246)

	Input	Position of [affix]	Gloss
a.	hqʷ-t	həqʷt	*sniff at it*
a'.	[L']+CH-hqʷ-t	h[aʔ]aqʷ-həqʷt	*keep smelling it, keep sniffing at it*
b.	ƛx̌ʷ-t	ƛəx̌ʷt	*spit it out*
b'.	[L']+CH-ƛx̌ʷ-t	ƛ[aʔ]ax̌ʷ-ƛəx̌ʷt	*spitting all over the place*
c.	ƛ̓q̓	ƛ̓əq̓	*get rotten*
c'.	[L']+CH-ƛ̓q̓	ƛ̓[aʔ]aq̓-ƛ̓əq̓	*all (e.g. apples) are getting rotten*
d.	ǰk̓ʷ-t	ǰək̓ʷt	*rub it*
d'.	[L']+CH-ǰk̓ʷ-t	ǰ[aʔ]ak̓ʷ-ǰək̓ʷt	*rubbing both (e.g. legs)*
e.	k̓ʷɬ	k̓ʷəɬ	*it spilled*
e'.	[L']+CH-k̓ʷɬ	k̓ʷ[aʔ]aɬ-k̓ʷəɬ	*it spilled all over the place*

f. mƛ̓	məƛ̓	*calm (on water)*
f'. [L']+CH-mƛ̓	m[aʔ]aƛ̓-məƛ̓	*calm spot all over the place*
g. ps	pəs	*it is numb*
g'. [L']+CH-ps-INC	p[aʔ]as-pəs-əs	*they (e.g. both legs) are numb*
h. tɬ	təɬ-t	*turn it (e.g. page)*
h'. [L']+CH-tɬ-t	t[aʔ]aɬ-təɬt	*spreading out many of them (e.g. blankets)*
i. x̌ɬ	x̌əɬ	*get angry*
i'. [L']+CH-x̌ɬ	x̌[aʔ]aɬ-x̌əɬ	*getting (really) angry*

The translations of (41.a'-i') are consistent with Characteristic reduplication which occurs with descriptive predicates and emphasizes a characteristic trait or tendency, and the augmentative nature of the plural /L'-/ affix[5]. The proposed re-analysis of these forms is transparent, given the identification of Characteristic reduplication (cf. Blake 1992, Watanabe 2000, and Blake (in prep)) and the existence of the plural /L'-/ morpheme.

6.2.2.7 Discussion and Proposed Analysis

The formal analysis developed in this section basically follows the line of analysis proposed by McCarthy and Prince (1994) for similar types of cases involving "infixation". Although the plural /L'-/ marker in Sliammon is aligned as close to the left-edge of the stem as possible (i.e. it is a prefix and tries to satisfy LEFTMOST), it is always mis-aligned by a single consonant in order to satisfy the higher-ranking constraint which ensures that the left edge of the Prosodic Word is aligned with the left-edge of the stem. This partial ranking is presented in (42).

(42) ALIGN L PRWD >> LEFTMOST

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[5]See Thompson and Thompson (1992) for a description of the range of meanings typically associated with Characteristic reduplication in Thompson (Salish), for example.

This has the effect of positioning this affix consistently after the first consonant of the stem. As shown by the following data, this could be the Root-initial consonant as in (43.a'-b'), or the first consonant of the left-most reduplicative prefix, as in (43.c'-e').

(43)

a. piʔ-it	piʔit	pέʔεt	*stuck together*
a'. [L']+piʔ-it	p[iʔ]iʔit	pέʔεʔεt	*really stuck together*
b. ǰaǰ̓a	ǰaʔǰa	ǰέʔǰε	*relative*
b'. [L']+ǰaǰ̓a	ǰ[aʔ]aǰaʔ	ǰέʔaǰεʔ	*relations*
c. DIM-ƛ̓uqʷ-it	ƛ̓u-ƛ̓qʷit	ƛ̓óƛ̓qʷεt	*spotted*
c'. [L']+DIM-ƛ̓uqʷ-it	ƛ̓[w̓]u-ƛ̓qʷit	ƛ̓óʔoƛ̓qʷεt	*patches, little spots*
d. saplin	saplin	sáplεn	*bread*
d'. [L']+DIM-PL-saplin	s[y̓]i-səp-saplin	sέʔεsəpsàplεn	*lots little bits of bread*
e. IMP-x̌ʷay-m+[ʔ]	x̌ʷa-x̌ʷyɩm̓	x̌ʷáx̌ʷyɩm̓	*diving*
e'. [L']+IMP-x̌ʷay-m+[ʔ]	x̌ʷ[aʔ]a-x̌ʷyəm̓	x̌ʷáʔʌx̌ʷyɩm̓	*diving many times*

Notice that the output of /L'-/ "infixation" entails glide vocalization, and creates a surface CVʔV sequence; it creates an open [CV . CV] syllable structure which satisfies the constraints ONSET, NOCODA and SYLL NUC discussed in Chapter 3. Misalignment of /L'-/ in order to satisfy the high-ranking ALIGN constraint does not create unnecessary violations of prosodic constraints, unlike infixation of s- as discussed in §6.2.1.1-6.2.1.2, although the cost associated with infixation is that it violates Contiguity. The other difference between the treatment of /s-/ and /L'-/ follows from their respective featural representation. The plural morpheme /L'-/ consists of a resonant which can be realized as a vocalic Nucleus, whereas /s-/ is not an eligible prosodic head.

Word-initial vocalization of the /L'-/ prefix in candidates such as *ʔípiʔit from the Input /[L']+piʔ-it/ would violate the ALIGN constraint, since the left-edge of the PrWd fails to be aligned with the left-edge of the stem.

The data and analysis presented in this section are significant since they identify a non-reduplicative prefix in Sliammon, the /L'-/ Plural, and show that this prefix is "infixed" after the first consonant of the stem. Furthermore, /L'-/ has phonological features which allow it to vocalize and function as a vocalic Nucleus. Schwa epenthesis fails to occur as in *L'[ə]-piʔit. Since stress must be aligned with the left-edge of the stem, schwa epenthesis in this context does not improve satisfaction of the Alignment constraint. This analysis of CVʔV and CVʔVC into separate morphemes C[Vʔ]V and C[Vʔ]VC also enables us to reduce the inventory of proposed types of Reduplication in Sliammon, and explains the interpretation of the data in §6.2.2.

Chapter 7: Conclusion

"Language is the most massive and inclusive art we know, a mountainous and anonymous work of unconscious generations."

Edward Sapir (1921:220)

7.0 Introduction

This chapter highlights the central descriptive observations and theoretical claims made in this dissertation. It also recaps some of the theoretical implications of the proposed analyses.

The primary source of the data in this dissertation is my fieldnotes collected from 1988 - 2000 in consultation with elders resident in Sliammon (cf. Appendix II). The body of the dissertation is supplemented with a set of Appendices which document important aspects of the phonology and morphology of the language: Appendix IV on Sound Contrasts, Appendix V on Root Canons, Appendix VI on Lexical Suffixes, and Appendix VII on the predicate complex, the primary affixes (prefixes and suffixes) and clitics attested in the data. The subsequent sections focus on the descriptive and theoretical claims made in the preceding chapters.

7.1 Summary: Representation of Schwa vs. Full Vowels

In this dissertation, I have argued that schwa in Sliammon is characterized as a bare Nucleus. Schwa is proposed to be non-moraic (i.e. it is weightless), and it lacks inherent phonological features. The allophones of schwa are brief in duration, and acquire their phonological features via colouration from adjacent consonants (and vowels), as discussed in detail in Chapter 2. It is proposed that this representation of schwa accounts for its phonological behaviour. This is contrasted with the proposed representation of the full vowels /i, u, a/ in Sliammon which are claimed to be both Nuclear and moraic at the prosodic level. Full vowels are also specified for inherent phonological features at the melodic level.

One of the major claims of this dissertation is that Full Vowel Reduction in Sliammon is not reduction to schwa. A reduced full vowel entails the loss of a mora resulting in a surface vowel which has the same prosodic representation as schwa (i.e. it is Nuclear but non-moraic), but crucially a reduced full vowel retains the features associated with the underlying full vowel. This is evidenced by the distinct realization of schwa versus a reduced full vowel in comparable environments.

Although the output of schwa colouration is distinct from the output of Full Vowel Reduction, the claim made here is that they share the same prosodic representation -- both are Nuclear and non-moraic.

7.2 Phonological Features

From a descriptive perspective, this dissertation has aimed at documenting the full range of consonant/vowel interactions, in addition to the effects of prosody on the surface output representations. In Chapter 2, it is argued here that Vowel Assimilation to adjacent consonants (and vowels) is subject to **Grounded Constraints**, following Archangeli and Pulleyblank (1994). The presence versus absence of inherent phonological features associated with the full vowels versus schwa, which is featureless, in conjunction with the Grounded Constraints in the language accounts for observed differences in Vowel Assimilation.

In Chapter 2 it is argued that the uvulars and laryngeals function as a natural class of post-velar consonants (i.e. PHAR), causing retraction of a preceding vowel. The dissertation also claims, following Kroeber (1989) and Blake (1992), that schwa is lowered and retracted to [ɑ] in the environment before ʔ. This generalization has important implications for the representation of laryngeals.

7.3 Prosodic Structure of Sliammon

This dissertation makes a number of important claims regarding the prosodic structure of the language. Coda consonants in Sliammon are claimed to be moraic, as evidenced by Compensatory Lengthening in the language. The failure of schwa to undergo Compensatory Lengthening, and the contrast in the behaviour of CəC versus CAC syllables is therefore attributed to the phonological weight of the Nucleus. CəCμ is mono-moraic whereas CAμCμ is bimoraic. Consequently, this thesis provides substantial empirical evidence for Shaw's (1996c) claim that "an adequate theory of syllable structure must recognize both Nuclear headedness and moraic weight as independent structural properties". Chapter 3 motivates syllable structures and metrical structures which are assumed in the remainder of the thesis; arguments are provided from a wide variety of constructions, as well as from native speaker judgements regarding morafication and syllabification.

7.4 Distribution of Schwa

One of the important generalizations regarding the distribution of schwa is the complementarity between the locus of stressed schwa and the occurrence of minor syllables in Sliammon. It is argued in Chapter 3 (§3.3) that Sliammon has left-headed trochaic feet. CC Roots therefore take schwa epenthesis in order to satisfy the constraint **Proper Headedness** at the level of the foot (=2.a-a'). In contrast, final extra consonants which occur at the right-edge of mono-morphemic words resist schwa epenthesis, as shown in (2.b-b").

(2)

	Input		**Output**	**Gloss**
a.	č̓ɬ	č̓əɬ	č̓íɬ	*rain*
a'.			*č̓ɬ	
b.	saɬtxʷ	saɬtxʷ	sáɬ . txʷ	*woman*
b'.			*sáɬ . t[ə]xʷ	
b".			*sá . ɬ[ə]txʷ	

Consider the tableau which characterizes the difference between these examples.

(3)

Input: č̓ɬ	PROPHEAD FT	O-CONTIG ROOT	DEP[NUC]
☞ a. č̓[ə́]ɬ		*	*
b. č̓ɬ	*!		
Input: saɬtxʷ	PROPHEAD FT	O-CONTIG ROOT	DEP[NUC]
☞ a'. sáɬ . txʷ			
b'. sáɬ . t[ə]xʷ		*!	*
c'. sá . ɬ[ə]txʷ		*!	*
d'. sá . ɬ[ə] . t[ə]xʷ		*!*	**

Schwa epenthesis occurs in (3.a) in order to satisfy the high-ranking constraint on Proper Headedness at the level of the foot, whereas in (3.a') Proper Headedness is satisfied by the initial vowel /a/. In (3.a') schwa epenthesis is blocked between the final consonant cluster since it would otherwise violate **Root Contiguity**. Notice that this analysis confirms Shaw's (1996c) hypothesis that Proper Headedness consists of three independent and rankable constraints within the grammar, summarized again in (4).

(4) **Proper Headedness** Shaw (1996c:10) (cf. Ito and Mester 1992; Ola 1995)

a.	PROPHEAD $_{PW}$	A Prosodic Word is headed by a Foot	
b.	PROPHEAD $_{FT}$	A Foot is headed by a Syllable	
c.	PROPHEAD $_{\sigma}$	A Syllable is headed by a NUC	[=SYLL NUC]

Notice that the final minor syllable (tx^w) in sáɬ . tx^w in (3.a') violates Proper Headedness at the level of the syllable (=SYLL NUC), since it lacks a vocalic Nucleus. This means that the constraint on O-Contiguity of the Root must also outrank PROPHEAD$_\sigma$ as shown by the tableau in (5).

(5)

Input: saɬtx^w	PROPHEAD FT PROPHEAD PW	O-CONTIG ROOT	PROPHEAD σ	DEP[NUC]
☞ a. sáɬ . tx^w			*	
b. sáɬ . t[ə]x^w		*!		*

Throughout the dissertation the distribution of schwa is subject to the distinction between derived and non-derived morphological environments. The observed asymmetries in Root canons in Sliammon (Chapter 4) provide language-internal evidence for the claim that schwa is epenthetic rather than present in the underlying representation.

7.5 Summary: Strategies to avoid Stressed Schwa in an open syllable

In Chapter 5 it was argued that stressed schwa in Sliammon tends to occur in closed syllables. Although stressed schwa does occur in a stressed open syllable in a limited number of cases involving intervocalic non-continuant resonants /ǰ, g/, there are also phonological constraints operative in Sliammon which militate against this configuration. In Chapter 5, it is argued that a wide range of seemingly unrelated allomorphy receives a unified explanation with reference to the constraint which bans schwa in stressed open syllables *ə́]σ, and its interaction with other constraints in the grammar. The strategies discussed in the context of this dissertation are summarized in (6).

(6) Strategies to avoid violation of *ə́]σ

	Input	Output	*ə́]σ	Strategy
a.	CəO'V	Cə́ʔ . O'V	*Cə́ . O'V	Restructure glottalized obstruent §5.1
b.	CəR'V	Cə́ʔ . RV	*Cə́ . R'V	Restructure glottalized resonant §5.2
c.	CəCV	Cə́C:V	*Cə́ . CV	Gemination of intervocalic consonant §5.3
d.	CəC=V	Cə́C=[h]V	*Cə́ . CV	[h] epenthesis after fricatives §5.4
e.	CəC=V	Cə́C=[ʔ]V	*Cə́ . CV	[ʔ] epenthesis after stops and affricates §5.4
f.	CəC[i]C	C[á]C[i]C	*Cə́ . C[i]C	Strengthening of schwa to a full vowel §4.4

What all of these strategies have in common is that they conspire to prevent schwa from occurring in a stressed open syllable. They do so by closing the syllable with a moraic coda consonant: Cə́Cμ.

One further question which the summary in (6) raises is: what is the distribution of these different strategies? For example, when do we get Glottal Restructuring as opposed to Gemination? Generally, the strategies are entirely predictable, based on phonological properties. If the medial consonant is either a glottalized obstruent or a glottalized resonant, then ordering of the glottal release with respect to the oral closure is the strategy which is adopted (=6.a-b). In the case that the medial consonant is non-glottalized, there are alternative strategies. Gemination and [h/ʔ] epenthesis (6.c-e) are strategies which are used by different speakers. Epenthesis of [h/ʔ] is documented between a Root and a following Lexical Suffix, whereas Gemination is documented in a wider-range of contexts. At the present point in time, it is also difficult to tell whether or not this variation should be attributed to individual differences between speakers, or if this distinction should be attributed to dialectal differences. Finally, strengthening of schwa to the full vowel [a] co-occurs with the infixation of the stative morpheme [i], as in (6.f). The non-continuant resonants /ǰ, g/ resist Gemination due to the constraints which govern the vowel/glide/obstruent alternations. As documented in Blake (1999), there are also other cases of allomorphy which are affected by the constraint *ə́]σ. Further research will entail documentation and analysis of other allomorphy which shows similar behaviour.

In Chapter 5, it is argued that the informal constraint *ə́]σ captures a prevalent generalization regarding foot structure in the language. The illicit surface form *Cə́ . CAC violates the constraint **SYLL MORA** (cf. Shaw 1995, 1996), since the first syllable lacks phonological weight, expressed in the dissertation in terms of moras. In addition, the second syllable is bimoraic CACμμ. This creates an ill-formed structure in which the phonological weight of the head of the foot is less than the phonological weight of the non-head. This violates the constraint **PEAK PROM FT** which is argued to have a significant role to play in the prosodic organization of the grammar. Optimal surface forms like Cə́Cμ . CəCμ show that the constraints in the grammar drive durational evenness which is typical of trochaic systems (cf. Hayes 1995, Kager 1995).

7.6 Summary: Status of unstressed schwas in open syllables

Much of the discussion in this thesis focuses on the distribution of stressed schwa. In this section, I briefly summarize one case of schwa epenthesis in an unstressed word-medial syllable. Consider the analysis of the diminutive form in (7.a'), repeated here from Chapter 4 (§4.2.1).

(7)

	Input	**V-Syncope in DIM**	**Output**	**Gloss**
a.	qʷup=šn		qʷópšɩn	*hair on legs*
a'.	DIM-qʷup=šn+[i]+[ʔ]	qʷu-qʷ<u>pšiṅ	qʷóqʷp[ə]šiṅ	*bit of hair on legs*

When a CAC Root undergoes diminutive reduplication (DIM) and is followed by a consonant-initial suffix, such as =šn, this collocation of morphemes along with morphologically triggered root-vowel deletion gives rise to a string of word-internal consonants: [CA-CC-CV...]. Since trimoraic syllables are avoided *μμμ]σ, and complex onsets are also pervasively banned in the language, schwa epenthesis occurs in order to optimize syllable structure constraints, and parse the Root-final consonant. The formal analysis is recapitulated here in (8).

(8) **Input:** DIM-q^{w}up=šn+[i]+[ʔ] **Output:** [q^{w}óq^{w}pəš̓in̓] *bit of hair on legs*

q^{w}u-q^{w}up=š[i]n̓	Root Faith	*COnset	O-Contig Root	*μμμ]σ	DEP[Nuc]
☞ a. q^{w}óq^{w} . p[ə] . š̓in̓ .					*
b. q^{w}óq^{w}<p> . š̓in̓ .	*!				
c. q^{w}ó<q^{w}>p . š̓in̓ .	*!				
d. q^{w}óq^{w} . pš̓in̓ .		*!			
e. q^{w}ó . q^{w}[ə]p . š̓in̓ .			*!		*
f. q^{w}óq^{w}p . š̓in̓ .				*!	

In summary, an attempt to improve the resulting syllable structure by deletion of either Root consonant is ruled out by **Root Faithfulness**, as in (8.b-8.c). Candidate (8.d) violates the high-ranking constraint against complex onsets in the language, whereas schwa epenthesis in (8.e) violates the contiguity relations between C_1 and C_2 of the Root. The optimal candidate (8.a) incurs a DEP[Nuc] violation, the cost associated with inserting schwa, but notice that schwa is inserted between the Root-final consonant and the initial consonant of the following Lexical Suffix =š[i]n̓. The position in which schwa is inserted produces optimal prosodic constituents without creating violations of either Root Faithfulness or O-Contiguity Root. In general, non-initial schwa epenthesis takes place between morphemes in order to avoid disrupting Root contiguity.

7.7 Other Implications: Peak Prom Ft and Full Vowel Epenthesis

Chapter 6 discusses two further implications for the analysis developed in the context of this dissertation. Section 6.1 documents and presents an analysis of the variant forms of the -hV possessive suffix in Sliammon. In particular, stems which end in a consonant cluster are shown to take [i] epenthesis rather than schwa epenthesis [ə] before the -hV suffix, as shown by the representative example in (9).

(9)

a.	tm̓=us=tn-hV	təʔmust[i]-hi-n	táʔmɔstèhɛn	*have a headband on*
b.		*təʔmust[ə]-hə-n	*táʔmɔstə̀hən	

By comparing the well-formedness of the resultant Foot structure in (10.a) versus (10.b), we can explain why (10.b) is ruled out.

(10)

a.	tm̓=us=tn-hV	təʔmust[i]-hi-n	(táʔμ . mɔsμ)(tèμ . hɛnμ)	*have a headband on*
b.		*təʔmust[ə]-hə-n	*(táʔμ . mɔsμ)(tə̀ . hənμ)	

In particular, focus on the well-formedness of the second foot: (tèμ . hɛnμ). In the optimal output form, the foot (tèμ . hɛnμ) satisfies Foot Binarity at both the syllabic and moraic levels. In addition, this foot also satisfies **PEAK PROM FT** which requires that the phonological weight of the head of the foot (i.e. the syllable: tèμ) is equal to or greater than the phonological weight of the non-head (i.e. the syllable: hɛnμ). It is hypothesized here that Full Vowel Reduction applies in unstressed syllables in (9-10), in keeping with the generalization regarding Full Vowel Reduction (cf. §4.3). Compare this with the well-formedness of the second foot in the ungrammatical example in (10.b). The foot *(tə̀ . hənμ) is comprised of an initial weightless syllable followed by a mono-moraic syllable (hənμ). This not only violates Foot Binarity at the level of the mora, but it also violates PEAK PROM FT since the unstressed syllable (hənμ) is heavier than the head of the foot (tə̀). This is an example of the ways in which the initial analysis presented in Chapters 3 & 4 can be extended in order to account for other data involving vowel epenthesis, like those presented in Chapter 6 (§6.1).

7.8 Comparative Research

This study clearly indicates that schwa is weightless in Sliammon; therefore, another project for future research will involve a comparison of the distribution and representation of schwa in

Sliammon to the distribution and representation of schwa in other Salish languages (e.g. Bagemihl 1991; Matthewson 1994; Kinkade 1993/1998; Willet and Czaykowska-Higgins 1995; Shaw et. al. 1999; Urbanczyk 1999a.b, amongst others). Further, the theoretical implications regarding weightless nuclei and headless minor syllables sets the stage for further comparison with other languages outside of the Salish language family which have been argued to have weightless vowels (cf. Michelson 1989, and Kager 1990).

Van Oostendorp (1999a) in his discussion of the role of schwa in phonological theory attributes the behaviour of schwa to various subtheories:

> *"In order to fully understand the behaviour of schwa, we need a fully developed theory of syllable structure, of metrical structure, of segmental structure, and of the way in which these different dimensions of phonological structure can interact. Inversely, while developing these subtheories, we sharpen our view of schwa. ...."*

The analysis of the distribution and representation of schwa in Sliammon does involve issues regarding segmental structure, syllable structure, and metrical structure but also adds to this list the interaction of phonological and morphological components of the grammar. These findings further underscore van Oostendorp's (1999a) concluding remarks:

> *"I suspect that we will not have a satisfying theory of schwa until we have a satisfying Theory of Everything."*

I would like to conclude in the traditional way of the Homalco, Klahoose, and Sliammon people:

hám kʷu ʔíʔ t̓ᶿók̓ʷ (also: hám kʷu ʔíʔ ɬóq̓ʷ)

hám kʷu ʔíʔ mʌ́ƛ̓.

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Abbreviations used in References:

AL	*Anthropological Linguistics*
BLS	*Berkley Linguistics Society*
CJL	*Canadian Journal of Linguistics*
CLS	*Chicago Lingusitics Society*
ICS(N)L	*International Conference on Salish (and Neighbouring) Languages*
IJAL	*International Journal of American Linguistics*
LI	*Linguistic Inquiry*
NLLT	*Natural Language and Linguistic Theory*
UBCWPL	*University of British Columbia Working Papers in Linguistics*
UCPL	*University of California Publications in Linguistics*
UHWPL	*University of Hawaii Working Papers in Linguistics*
UMOP	*University of Massachusetts Occasional Papers*
UMOPL	*University of Montana Occasional Papers in Linguistics*
WCCFL	*West Coast Conference on Formal Linguistics*
WSCLA	*Workshop on Structure and Constituency in Languages of the Americas*

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Appendix I: Salish Language Classification

The purpose of this appendix is to situate the language of the Homalco, Klahoose, and Sliammon peoples with respect to the other Salishan languages within the family. The Salish language family is comprised of 23 languages, as outlined in (1) following Czaykowska-Higgins and Kinkade (1998).

(1) Salish Languages (cf. Czaykowska-Higgins & Kinkade 1998, and Kroeber 1999).

I Bella Coola

II Coast Salish

- **Comox : Island Comox, and Mainland Comox : Homalco, Klahoose, Sliammon**
- Pentlatch
- Sechelt
- Squamish
- Halkomelem
- Northern Straits
- Klallam
- Nooksack
- Lushootseed
- Twana

III Tsamosan

- Quinault
- Lower Chehalis
- Upper Chehalis
- Cowlitz

IV Tillamook

V Interior Salish

- Lillooet

Thompson

Shuswap

Colville-Okanagan

Columbian

Spokane-Kalispel-Flathead

Coeur d'Alene

As mentioned in Chapter 1, the language spoken by the Homalco, Klahoose, and Sliammon peoples is often referred to as "Comox" in order to include the Island Comox language once spoken on Vancouver Island and the language spoken by the Homalco, Klahoose and Sliammon people, traditionally spoken on the Mainland. The language spoken by the Homalco, Klahoose, and Sliammon peoples is the northernmost of the Coast Salish languages. For a detailed discussion of the Northern Coast Salish (Comox, Pentlatch, and Sechelt), the reader is referred to Kennedy and Bouchard (1990:441-452) in *Handbook of North American Indians*, Volume 7: Northwest Coast, edited by Wayne Suttles, Smithsonian Institution, Washington, D.C.

The reader is also referred to the maps and place names which appear in Kennedy and Bouchard (1983: 149 -170). The non-Salishan neighbours of the Mainland Comox (Homalco, Klahoose, and Sliammon) are the Chilcotin (Athabaskan) to Northeast, and the Kwak̓wala (Northern Wakashan) to the Northwest. The Sechelt (Coast Salish) are located to the south of Sliammon territory, and Lillooet (Northern Interior Salish) to the east across the Coastal Mountains.

Appendix II: Language Consultants

This appendix contains a biographical sketch for each of the language consultants who have so generously contributed to the documentation of the language presented in the context of this dissertation: č̓ɛ́č̓ɛhatànapıč ! The consultants names appear in alphabetical order.

Dominic, Phyllis

Born: May 4th, 1940 at Sliammon. Her grandfather was Johnny Dominic of Squirrel Cove. Mrs. Phyllis Dominic was raised by her paternal grandparents at Squirrel Cove on Cortes Island, and moved back to Sliammon at age nine.

George, Mary

Mrs. Mary George (née: Tom) was born August 2, 1924 at Sliammon, B.C. Her grandfather (her father's father) was Chief Tom (Thomas Timothy) of Sliammon, who played a significant role in providing her with her knowledge of the language. Mrs. Mary George was monolingual in Sliammon up until age six when she attended elementary school at Sliammon, and learned some English. She never attended residential school. Mrs. Mary George has lived at Sliammon all her life, and has been a language consultant for many years.

Hanson, Eva

Born: November 5, 1927.

Mrs. Eva Hanson's mother was Cecilia Galligos of Sliammon, and her father was Albert Wilson of Church House. Mrs. Eva Hanson grew up in Homalco territory, and attended the school at Church House up until grade 6. She did not attend residential school. She moved to Sliammon in 1980.

Harry, Marion

Born: April 30, 1937 at Church House, B.C.

Mrs. Marion Harry's father was Johnson Wilson of Church House, B.C. Her great-grandfather was George Wilson of Church House. Her mother was Josephine George of Church House, B.C. Mrs. Marion Harry's maternal grandfather was the well-known carver Frank George, also of Church House, B.C. Mrs. Marion Harry was monolingual until age 5 when she left Church House to attend residential school in Sechelt. She returned to Church House, and then moved to Sliammon in 1968. She currently teaches the Sliammon language in the Powell River school district.

Harry, Pete

Born: April 17, 1939 at Church House, Bute Inlet.

Mr. Pete Harry's mother was Elizabeth (Hackett) Harry of Church House, and his father was Jimmy G. Harry also of Church House, B.C. Mr. Pete Harry was monolingual until about age 12, and moved to Sliammon from Church House in 1968.

McGee, Agnes

Born: November 14, 1923

Mrs. Agnes McGee's father was Jimmy Timothy of Sliammon and her mother was Molly Timothy (née: George) of Sliammon. Mrs. Agnes McGee's paternal grandparents were Captain Timothy of Sliammon, and Anne Timothy of Cape Mudge. Agnes' maternal grandparents were Bob and Jeannie George of Sliammon. Agnes' first language is Sliammon which she spoke at home. Her parents Jimmy and Molly spoke both Sliammon and Chinook Jargon. Agnes McGee attended the elementary school in Sliammon and did not attend Residential School.

Mitchell, Joe

Born: October 16, 1935 in Squirrel Cove

Mr. Joe Mitchell's mother was Rose Dominick (Klahoose) from Squirrel Cove, Cortes Island. His father was William Mitchell, originally from Sechelt. Mr. Joe Mitchell moved to Sliammon in 1959 and in 1971 was elected Chief. He actively pursued his interests in the relationship between language and culture. He was an expert story-teller who brought these traditional oral teachings to life. He passed away May 11th, 2000 at Sliammon.

Paul, Elsie

Born: September 21, 1931 at Sliammon

Mrs. Elsie Paul's parents were Gilbert Francis and Lily (Timothy) Francis of Sliammon. Her maternal grandparents were Jim and Molly Timothy of Sliammon. Mrs. Elsie Paul was raised by her maternal grandmother Mrs. Molly Timothy. Mrs. Elsie Paul's first language is Sliammon, and she learned to speak English as a second language. Mrs. Elsie Paul continues to share her knowledge of the language and traditional teachings both within the community and within the broader cross-cultural context of the school system and other agencies.

Pielle, Sue (née: Mitchell)

Born: December 23, 1932 in Sliammon

Mrs. Sue Pielle is the daughter of Rose Dominick (Klahoose, Squirrel Cove) and William Mitchell (Sechelt); she is Mr. Joe Mitchell's older sister. Mrs. Sue Pielle started to teach the language in 1977 at the alternate school at Sliammon. In 1982 she began to teach the language and traditional culture at the Sliammon či:čuy̓ school. She continues her active involvement in the Sliammon language program, and has been very involved in producing a number of Sliammon books and videos.

Appendix III: Comparison of Transcription Systems

The following appendix is intended as a guide to the transcription systems used from (1971 - present) in order to write the Mainland dialects: Homalco, Klahoose, and Sliammon. Given certain issues of complexity in establishing direct correspondences for the transcription systems of Sapir (1915) and Barnett (fieldnotes), they are not included in the table below. The system adopted in this thesis appears as *Current System.*

(1) Mainland Comox: Language of the Homalco , Klahoose , and Sliammon peoples

Current System	Davis (1971 et seq)	Hagège (1981)	Kennedy & Bouchard (1983)
p , p̓	p , p̓	p , p̓	p , p̓
t^{θ} , t̓$^{\theta}$	ç , ç'	ç , ç'	tth , th'
t , t̓	t , t̓	t , t̓	t , t̓
ƛ , ƛ̓	ƛ , ƛ̓	ƛ , ƛ̓	tl , tl̓
č , č̓	č , č̓	č , č̓	ch , ch'
k , k̓	k , k̓ [k^y , k̓^{y}]	k , k̓	k , k̓
k^w , k̓^{w}	k^w/k^o , k̓^{w}/k̓^{o}	k^w , k̓^{w}	kw , kw'
q , q̓	q , q̓	q , q̓	k̲ , k̲̓
q^w , q̓^{w}	q^w/q^o , q̓^{w}/q̓^{o}	q^w , q̓^{w}	k̲w , k̲w'
θ	θ	θ	th
s	s	s	s
ɬ	ɬ	ł	lh
š	š	š	sh
x^w	x^w/x^o		xw
x̌, x̌^{w}	x̣ , x̣^{w}/x̣^{o}	x̣ , x̣^{w}	x̲ , x̲w
m , m̓	m , m̓	m	m , m̓
n , n̓	n , n̓	n	n , n̓
l , l̓	l , l̓	L	l , l̓
y , y̓	y , y̓	y	y , y̓
w , w̓	w , w̓	w	w , w̓
h	h	h	h
ʔ , '	ʔ , '	ʔ	7
ǰ , ǰ̓	ǰ , ʔǰ	ǰ	j , ʔj
g , g̓	g , ʔg	g	g , ʔg
/L, L'/ [y~ w ~ ɬ ~ ʔ]	y ~ w ~ ɬ ~ ʔ		y ~ w ~ ɬ ~ ʔ
/i/	/i/	/e/	i /ɛ/ [ɛ ~ e ~ ɪ ~ i ~ ei]
/u/	/u/	/o/	u /o/ [o ~ u ~ ɔ]
/a/	/a/	/a/	a /a/ [ɑ]
ə	/ə/	/ə/	e /ə/ [ʌ ~ ə ~ v [ʊ]]
i:	i:	e:	ii
u:	u:	o:	uu
a:	a:	a:	aa

(2)

Current System	Kroeber (1991/1999)	Blake (1992)	Watanabe (1994, 2000)
p , p̓	p , p̓	p , p̓	p , p’
t^{θ} , $t̓^{\theta}$	t^{θ} , $t̓^{\theta}$	ç , ç’	t^{θ} , $t’^{\theta}$
t , t̓	t , t̓	t , t̓	t , t’
č , č̓	č , č̓	č , č̓	č , č’
ƛ , ƛ̓	ƛ , ƛ̓	ƛ , ƛ̓	ƛ , ƛ’
k , k̓	k , k̓	k , k̓	k , k’
k^w , $k̓^w$	k^w , $k̓^w$	k^w , $k̓^w$	k^w , $k’^w$
q , q̓	q , q̓	q , q̓	q , q’
q^w , $q̓^w$	q^w , $q̓^w$	q^w , $q̓^w$	q^w , $q’^w$
θ	θ	θ	θ
s	s	s	s
ɬ	ɬ	ɬ	ɬ
š	š	š	š
x , x^w	x^w	x , x^w	x^w
x̌, $x̌^w$	x̌, $x̌^w$	x̣ , $x̣^w$	x̣ , $x̣^w$
m , m̓ [ʔm , mʔ, m̓]	m , ʔm/mʔ	m , m̓ [ʔm , mʔ, m̓]	m , m’ [ʔm , mʔ, m’]
n , n̓ [ʔn , nʔ , n̓]	n, ʔn/nʔ	n , n̓ [ʔn , nʔ , n̓]	n , n’ [ʔn , nʔ , n’]
l , l̓ [ʔl, lʔ, l̓]	l, ʔl/lʔ	l, l̓ [ʔl, lʔ, l̓]	l , l’ [ʔl, lʔ, l̓]
y , y̓ [ʔy, yʔ, y̓]	y, ʔy/yʔ	y, y̓ [ʔy, yʔ, y̓]	y , y’ [ʔl, lʔ, l̓]
w , w̓ [ʔw, wʔ, w̓]	w, ʔw/wʔ	w, w̓ [ʔw, wʔ, w̓]	w , w’ [ʔw, wʔ, w̓]
h	h	h	h
ʔ	ʔ	ʔ	ʔ
ǰ, ǰ̓	ǰ , ʔǰ	Y, Y’ [ǰ ~ y ~ i ~ č]	ǰ , ǰ’
g, g̓	g, ʔg	W, W’ [g~w~u~x^w]	g, g’
L , L’	[ɬ ~ y ~ w ~ ʔ]	L, L’ [ɬ ~ y ~ w ~ʔ]	L, L’
/i/	i	/e/	/i/
/u/	u	/o/	/u/
/a/	a	/a/	/a/
ə	ə	/ə/	/ə/
long vowel V:	V·	V:	V: [i:, ɛ:, u:, o:, a:]
half long V·	----	V·	V·

Appendix IV: Consonant Contrasts

IV.0 Introduction

The data in this Appendix provide evidence for the Consonant contrasts in Sliammon. The examples are organized from a *phonological perspective*, first by Manner of Articulation: Stops (stops and affricates) §IV.1, Fricatives §IV.2, Sonorant Obstruents /ǰ, ǰ̓, g, g̓/ §IV.3 and Resonants in §IV.4. Then within each section, the sounds are presented by Place of Articulation starting with anterior consonants moving progressively further back in terms of Place of Articulation: Labials, Interdental/Dental, Alveolars, Alveopalatals, Velars, Uvulars, and Laryngeals. Each plain sound precedes its glottalized/labialized couterpart. Every attempt has been made to provide a few examples of each consonant sound in word-initial, word-medial (syllable initial and syllable final), and word-final position in the environment of each one of the vowels: i, u, a, [ə]. Word-internal examples of glide vocalization are also given. The data in the left-hand column shows the phonemic vowel quality plus the effects of schwa epenthesis whereas the data in the right-hand column is the surface output form. The exact morphological composition of each word is not indicated here, although suffixes are introduced by a hyphen (-) and Lexical Suffixes by the use of an equals sign (=). An epenthetic h appears in square brackets: [h], as does the stative infix [i], and [i] associated with diminutives. There are still some gaps in the data as indicated by the dotted line ----. This appendix should therefore be considered a document which represents work in progress, and can be subsequently refined and updated. Place names cited from Kennedy and Bouchard are marked K&B (1983).

IV.1 Obstruents: Stops and Affricates

The Sliammon **Stops** and **Affricates** are presented in the following order by **Place of Articulation** from sounds produced with primary stop closure in the front portion of the oral cavity to sounds produced progressively farther back in their Place of Articulation (LAB, COR, DOR, PHAR): p , p̓ , t^{θ} , $t̓^{\theta}$, t , t̓ , ƛ , ƛ̓ , č , č̓ , k , k̓ , k^w , $k̓^w$, q , q̓ , q^w , $q̓^w$, ʔ.

p

(1) word-initial position

a. pit	[pé^yt ~ péit]	*low*
piləq	[péilʌqʰ ~ pélʌqʰ]	*bracket fungus, mushroom*
piwɬ	[péwɬ]	*rendered fat, lard*
pišpiš	[píšpíš]	*here kitty, kitty* (calling cat)
b. pus=ɬaɬ	[pósɬʌɬ]	*Adam's apple*
pus-ʔm=min	[púsʔʌmɪn ~ púsʔʌmɛn]	*baking powder*
pukʷ	[púkʷ]	*book*
pun	[pun]	*spoon*
puʔpxʷ	[púʔpxʷ]	*kindling*
puxʷ-[i]m	[púxʷem] ú:	*steam*
puh-ʔəm	[púhʔʌm ~ pú:ʔʌm]	*wind*
puƛ̓-[i]m	[pú:ƛ̓em]	*dust*
c. paľ	[páľ]	*heron*
pa-paq-aq	[pápaqaq]	*dawn*
paL'	[páʔa]	*one*
d. pəč-p[i]č	[pə́čpič]	*awake*
pəɬt	[pʌ́ɬt]	*thick*
pəq	[pʌqʰ]	*white*
pəqʷ=ay	[pʌ́qʷay]	*rotten wood*
pəskit	[pə́skɪtʰ]	*pilot bread* (English *buiscut*)

(2) medial position: between vowels (syllable initial before i, u, a, ə)

a.	ƛ̓ip=iws	[ƛ̓ɛ́pews]	*underwear*
	kapi	[kápi ~ kʸápi]	*coffee*
	nəp=iqʷan	[nʌ́pɛ́qʷʌn]	*brain*
	pi-ʔi-pi-pukʷ	[péʔɛpèpukʷ]	*little books* (dim.pl.)
b.	qʷup=uθin	[qʷópɔθen ~ qʷó:pòθɛn]	*beard*
	kapu	[kǽpɔ]	*coat*
c.	θapax̌ʷ=us	[θápax̌ʷos]	*antler, horn*
	ʔupan	[ʔópʌn]	*ten*
	ƛ̓ip=awus	[ƛ̓é·pawus]	*below the eye*
	tap=aymixʷ=tən	[tápaymìxʷtən]	*brassiere, bra* (cf. táptən)
	kʷupa	[kʷúpa ~ kʷúpʌ]	*grandfather, grampa*
d.	mapal=awus	[mápʌlàwʊs]	*pupil* (eye)
	pəpa	[pə́pʌ]	*pepper*
	pəpa=aya	[pə́pʌhàyɛ]	*pepper shaker*

(3) medial position: before a consonant (syllable final after i, u, a, ə)

a.	ɬip=tən	[ɬéptən]	*eyelashes*
b.	x̌ʷup-x̌ʷup	[x̌ʷɔ́pʰx̌ʷɔpʰ]	*hummingbird*
	sup=nač	[sópnʌč]	*tail*
c.	saplin	[sáplɛn]	*bread*
	kʷup=ap=šin	[kʷúpapšin]	*heel*
	tap=tən	[táptən ~ táptn̩]	*corset* (tight=thing)
d.	nəp=šən	[nə́pšɩn]	*marrow*
	nəp=nač	[nə́pnʌč]	*pants*
	x̌əpǰa=kʷu	[x̌ʌ́pǰɛkʷu]	*back eddy*
	qəp-t	[qʌ́ptʰ]	*touch it*
e.	kʷu-kʷpa-ʔ	[kʷúkʷpaʔ]	*grandfather*

(4) word-final position (syllable coda after i, u, a, ə)

a.	-ip		
b.	x̌ʷup-x̌ʷup	[x̌ʷɔ́pʰx̌ʷɔpʰ]	*hummingbird*
	θiǰiqʷup	[θίǰέqʷɔp]	*hat*
	ʔuʔp	[ʔóʔpʰ]	*Church House* (place name)
	ƛ̓up	[ƛ̓ópʰ]	*heal*
c.	ʔayaʔ-ap	[ʔáyɛʔʌ́p]	*your (pl) house*
	tuyʔ=ap	[túyʔap]	*follow behind s.o.*
	tat=nač=ap	[tátnáčep]	*hip*
	čapθ	[čέpθ]	*aunt, uncle*
d.	ƛ̓əp	[ƛ̓ʌp]	*deep*

p̓

(5) word-initial position (syllable onset before i, u, a, ə)

a.	p̓ip̓i	[p̓έp̓eʸ ~ p̓έp̓ei]	*thin*
	p̓iq̓	[p̓έq̓]	*wide*
	p̓iyqin	[p̓éiqen ~ p̓éiqɛn]	*shoulder, shoulder blade*
	p̓it̓ᶿ=ay=it̓ᶿa=tən	[p̓έt̓ᶿàyit̓ᶿàtιn ~ p̓έt̓ᶿ-]	*washing machine*
	p̓it̓ᶿ-ʔəm	[p̓έt̓ᶿʔəm]	*squeeze, wring out (s.t.)*
	p̓i-p̓ət̓ᶿ[i]t	[p̓έp̓aʔt̓ᶿιtʰ]	*small tin can*
b.	p̓uq̓ʷ	[p̓oq̓ʷ]	*brown, grey*
	p̓uq̓ʷ-uq̓ʷ	[p̓óq̓ʷɔq̓ʷ]	*get moldy*
	p̓uhu	[p̓ɔ́hɔ] [p̓óx̌ʷo]	*raven*
c.	p̓aq̓əm	[p̓áq̓ʌm]	*green, yellow, orange*
	p̓al̓at̓ᶿ	[p̓ál̓ʌt̓ᶿ]	*skunk*
	p̓əq̓=aya	[p̓áʔq̓áyι]	*smoke vent, stovepipe*
	p̓əy̓an	[p̓áy̓ɛn ~ p̓áʔᵊyɛn]	*fir bark, bark of any tree*

d.	p̓əθ	[p̓ʌ́θ]	*black*
	p̓əθk	[p̓ʌ́θk]	*bullhead* (fish)
	p̓əgay̓	[p̓ʌ́gʌy̓]	*halibut*
	p̓əq̓	[p̓ʌ́q̓]	*smoke* (from fire)
	p̓ət̓ᶿt	[p̓áʔt̓ᶿtʰ]	*tin can*
	p̓ət̓ᶿ-p̓ət̓ᶿt	[p̓ə́t̓ᶿp̓àʔt̓ᶿətʰ]	*tin cans*

(6) medial position: before vowel (syllable initial)

a.	p̓əy-p̓iyqin	[p̓íp̓iᵊqən]	*shoulders* (pl.)
b.	ʔap̓uk̓ʷ	[ʔáp̓ok̓ʷ] ʔáp̓ɔk̓ʷ	*maggots*
	ɬup̓-ət	[ɬóp̓ɔt]	*to peel (s.t.)*
c.	t̓ap̓as	[t̓áp̓as]	*cave*
d.	--p̓ə		

(7) medial position: before a consonant (syllable final)

a.	--ip̓C		
b.	p̓up̓t̓əčxʷ	[p̓óp̓t̓ʌčxʷ]	*to braid* gloss
c.	ʔap̓tən	[ʔáp̓tən]	*green sea urchin*
d.	səp̓=šən	[sʌ́p̓šɩn]	*get hit on leg*
	p̓ax̌-p̓x̌u	[p̓áx̌p̓ᵊx̌ʷò] ò:	*lots of ravens*

(8) word-final position

a.	ʔasip̓	[ʔásɛp̓]	*to call s.b. down*
b.	ɬup̓	[ɬóp̓]	*peel*
	x̌ʷup̓	[x̌ʷóp̓]	*pierce, poke*
c.	x̌ap̓	[x̌áp̓]	*cradle basket*
d.	yəp̓	[yɩp̓]	*to break* (as cup)
	ʔəsp̓	[ʔə́sp̓]	*end, finish*
e.	x̌ʷuʔx̌ʷp̓	[x̌ʷɔ́ʔx̌ʷp̓]	*awl*

t^{θ}

The sound t^{θ} occurs in a very limited number of morphemes. The sound t^{θ} is the form of the first person singular possessive pronoun *my*, as in the following examples.

(9)	tə t^{θ} ʔayaʔ	[tə t^{θ} ʔáyɛʔ]	*my house*
	paL'=us tə t^{θ} ʔapls	[páwʔus tət^{θ} ʔǽpl̩s]	*I've got one apple*
	x̌aw̓s tət^{θ} ƛ̓əqəm=ayʔiq^{w}	[x̌áw̓s tət^{θ} ƛ̓ʎ́qamàyɛq^{w}]	*my strawhat is new*

As documented by Kroeber (1999:177) the nominalizer proclitic s is omitted after the possessive proclitic t^{θ} (as well as θ 2sgposs, and ms 1plPoss). Kroeber observes that the possessive proclitics favour the presence of the determiners for phonotactic support since Sliammon (MComox) in general lacks initial consonant clusters. Consider the following data from Kroeber (1999) which shows the first person singular possessive proclitic t^{θ} in nominalized clauses.

(10) data from Kroeber (1999: 177)

a. niʔ-θay-əm [tət^{θ} k^{w}ik^{w}p̓uwmix^{w}]

say-Tr+1sgObj-Intr det 1sg.Poss(+Nom) sand.dune

They (might) say about me that I am a sand dune

b. ʔa-ʔax^{w} sk^{w}iʔǰuɬ [šət^{θ} pəčaʔm-uɬ]

Impf-snow this.morning det 1sg.Poss(+Nom) wake-past

It was snowing this morning when I woke up

The glottalized counterpart t̓$^{\theta}$, on the other hand, occurs with much greater frequency.

t̓ᶿ

(11) word-initial position (syllable onset before i, u, a, ə)

a.	t̓ᶿi:t̓ᶿit	[t̓ᶿɛ́:t̓ᶿɛt]	*narrow*
	t̓ᶿič-ič	[t̓ᶿéčič]	*get bitter*
	t̓ᶿiyič̓	[t̓ᶿéyɩč̓]	*twisted*
	t̓ᶿik̓ʷ-	[t̓ᶿɛk̓ʷ-]	*left* (as in *left-handed*)
	t̓ᶿiwq̓ʷ / t̓ᶿiwq̓	[t̓ᶿéwq̓ʷ ~ t̓ᶿɛ́wq̓]	*red elderberry*
b.	t̓ᶿuk̓ʷ	[t̓ᶿok̓ʷ]	*day, light, bright*
	t̓ᶿum=aǰ̓u	[t̓ᶿómáʔǰu]	*barnacle*
	t̓ᶿəx̌u	[t̓ᶿóx̌ʷo ~ t̓ᶿɔ́x̌ʷ:ɔ]	*ling cod*
	t̓ᶿusus	[t̓ᶿɔ́sɔs]	*dusk*
	t̓ᶿuʔ=čis	[t̓ᶿóʔčɩs]	*seven*
	t̓ᶿux̌ʷ-am-ʔa=min	[t̓ᶿóx̌ʷamʔʌmɩn]	*dish pan*
c.	t̓ᶿapiš	[t̓ᶿápɩš]	*throw it*
	t̓ᶿač̓[i]ɬ	[t̓ᶿáč̓ɛɬ]	*numb*
	t̓ᶿat̓iq̓	[t̓ᶿát̓ɛq̓]	*a drop of water*
d.	t̓ᶿəč̓	[t̓ᶿəč̓]	*bitter, sour*
	t̓ᶿəmš	[t̓ᶿʌmš]	*soaked*
	t̓ᶿəčil̓i	[t̓ᶿə́čel̓e ~ t̓ᶿə́čél̓e]	*kingfisher*
	t̓ᶿəmtəq	[t̓ᶿʌ́mtʌq]	*eulachon, candlefish*
	t̓ᶿəm=tən	[t̓ᶿə́mtən]	*breast*
	t̓ᶿəɬ=tn	[t̓ᶿə́ɬtn̩]	*Refuge Cove* K&B(1983)
	t̓ᶿəkʷ-t	[t̓ᶿʊkʷt]	*wipe it*

(12) medial position: (syllable initial before i, u, a, ə)

a.	t̓ᶿi-t̓ᶿik̓ʷ	[t̓ᶿét̓ᶿek̓ʷ]	*worm*
	t̓ᶿi-t̓ᶿiq̓	[t̓ᶿɛ́t̓ᶿɛq̓]	*mud*
	t̓ᶿixʷ-t̓ᶿixʷ	[t̓ᶿéxʷt̓ᶿexʷ]	*fish hawk*
	x̌at̓ᶿ=inas	[x̌á:t̓ᶿénʌs]	*bone centre of chest*
	mənat̓ᶿi	[mə́nat̓ᶿɛ]	*drum*
b.	t̓ᶿu-t̓ᶿuq̓ʷ	[t̓ᶿót̓ᶿɔq̓ʷ]	*feather*
	nat̓ᶿ=us-əm	[nát̓ᶿosʌm]	*nod one's head*
c.	gət̓ᶿ-amin /gt̓ᶿ-ʔm=min/	[gə́t̓ᶿʌ́men ~ gʌ́t̓ᶿʌ́men]	*chisel*
	p̓it̓ᶿ=ay̓=it̓ᶿa	[p̓ɛ́t̓ᶿáy̓it̓ᶿa]	*wash clothes*
	p̓it̓ᶿ=ay=it̓ᶿa=tən	[p̓ɛ́t̓ᶿàyit̓ᶿàtɩn ~ p̓ét̓ᶿ-]	*washing machine*
	t̓ᶿəx̌=it̓ᶿa	[t̓ᶿʌ́x̌ɛ́t̓ᶿʌ]	*worn out* (e.g. clothing)
	haǰ=it̓ᶿa=tən	[háǰit̓ᶿátn̩]	*frame for tanning hides*
d.	θat̓ᶿəm	[θát̓ᶿʌm ~ θát̓ᶿəm]	*spring salmon*
	t̓ᶿəm-t̓ᶿəm=tən	[t̓ᶿə́mt̓ᶿəmtən] [ʌ] ?/a/	*breasts* (pl)
	ʔit̓ᶿəm ~ ʔit̓ᶿəm̓	[ʔé·t̓ᶿəm̓ ~ ʔé:t̓ᶿəm]	*blanket*

(13) medial position: before a consonant (syllable final)

a.	-----it̓ᶿ		
b.	--- ut̓ᶿ		
c.	t̓ᶿa-t̓ᶿǰim̓in	[t̓ᶿát̓ᶿǰɛʔmɛn]	*shadow*
	x̌at̓ᶿ-θut	[x̌át̓ᶿθɔt]	*to fit* (as coat, clothes)
d.	x̌ʷət̓ᶿq̓ʷ=uǰ̓a	[x̌ʷʌ́t̓ᶿq̓ʷóʔǰɛ]	*wrist*
	k̓ʷət̓ᶿ=nač-t	[k̓ʷʊ́t̓ᶿnʌčt]	*turn s.t. upside down*
	k̓ʷət̓ᶿ=nač=igiɬ	[k̓ʷə́t̓ᶿnačígiɬ]	*Alpha Bluff* K&B(1983) *overturned canoes*
	t̓ət̓ᶿš	[t̓ʌ́t̓ᶿš]	*to squirt*

(14)	word-final position		
a.	x̌it̓ᶿ	[x̌ɛt̓ᶿ]	*uncooked*
	x̌it̓ᶿ	[x̌ɛt̓ᶿ]	*iron* (metal)
b.	---- ut̓ᶿ		*glutton, uvula*
c.	p̓al̓at̓ᶿ	[p̓ál̓ʌt̓ᶿ]	*skunk*
d.	ʔat̓ᶿ	[ʔát̓ᶿ ~ ʔʌt̓ᶿ]	*bay*
	q̓at̓ᶿ-	[q̓at̓ᶿ-]	*gather*
e.	məq̓ʷt̓ᶿ	[máʔqʷt̓ᶿ]	*wild onions, onion*

t

(15)	word-initial position		
a.	tih	[tih ~ ti:]	*big*
	titik̓	[tí:tik̓] i:	*skinny*
	tiqiw	[tɛ́qɛw]	*horse*
	tixʷθaɬ	[tíxʷθʌɬ]	*tongue*
b.	tuq̓ʷum	[tóq̓ʷɔm]	*a cold*
	tumiš	[túmɩš]	*man*
	tutx̌ʷ=ɬaɬ	[tótx̌ʷɬaɬ]	*necklace*
c.	tal̓[i]č	[tál̓ɩč]	*round*
	təq̓ʷa	[táʔq̓ʷa]	*octopus, devil fish*
	takin / takən	[tǽkɩn]	*stockings*
	tan	[tan]	*mother*
	taʔa=čis	[táʔačis]	*to travel*
d.	təkʷ=an̓a	[tʊ́kʷan̓a]	*deaf*
	təsit	[tʌ́set]	*near*
	təkʷɬi	[tʊ́kʷɬe]	*rabbit*
	təm̓	[tʌm̓] tʌ́mʔ	*belt*
	tə-təw̓	[tɩ́tuʔ]	*starting to freeze, icy*

	tǝq-t ga	[tʌ́qtʰ gʌ]	*close it* (request)
(16)	medial position: before a vowel or syllabic consonant (syllable initial)		
a.	k̓ʷǝt=ičǝn	[k̓ʷʊ́téčǝn]	*humpback salmon*
	sǝp̓=aǰitiq	[sáʔp̓áǰɪtɛq]	*get hit on the chin*
b.	saɬtxʷ-s	[sáɬtos]	*his wife*
c.	tuʔ-tam̓iš /tu-tumiš+[ʔ]/	[túʔtám̓ɪš] : tu-taʔmɪš	*little boy*
d.	ɬip=tǝn	[ɬéptǝn]	*eyelashes*
	tǝm̓=us=tǝn	[táʔmɔ́stn̩]	*headband*
	q̓ʷatǝm ?	[q̓ʷʌ́tʌm]	*river*
e.	ʔuɬtxʷ	[ʔóɬ . txʷ ~ ʔóɬ . tw̥]	*enter*
	saɬtxʷ	[sáɬ . txʷ ~ sáɬ . tw̥]	*woman*
	sa[ʔ]ɬtxʷ	[sáʔɬ . txʷ ~ sáʔɬ . tw̥]	*young girl at puberty*
	ʔaɬtxʷ	[ʔáɬ . txʷ ~ ʔáɬ . tw̥]	*room*
	ʔiytxʷ	[ʔéy . txʷ ~ ʔéy . tw̥]	*roof*
(17)	medial position: before a consonant (syllable final)		
a.	ti-th=unaxʷ	[títhónaxʷ]	*rough water*
b.	tutx̌ʷ=ɬaɬ	[tótx̌ʷɬaɬ]	*necklace*
c.	šʔt=qin	[šɛ́tqɛn]	*upper lip*
	tat=nač=ap	[tátnáčɛp]	*hip, rump*
d.	č̓ǝtq-amin /č̓tq-ʔm=min/	[č̓ɪ́tqàmɪn ~ č̓ɛ́tqàmɪn]	*knife*
	q̓ǝtxʷ-ǝt	[q̓ʌ́txʷʌt]	*burn it*
(18)	word-final position		
a.	x̌ʷiʔit	[x̌ʷɛ́ʔɛt]	*wedge*
	q̓ʷit	[q̓ʷɛt]	*beach*
	x̌ʷuwit	[x̌ʷówɛt]	*ditch, hallow*

b.	ǰuk̓ʷ-ət	[ǰúk̓ʷɔt]	*to crush s.t.*
c.	n̓a-nat	[nánat]	*evening*
d.	θəqət	[θʌ́qʌt]	*sidehill*
	θəqət=umixʷ	[θʌ́qʌtómɩxʷ]	*steep shore*
	č̓ət	[č̓ɩt]	*get cut*
e.	kʷum̓t	[kʷúm̓t]	*kelp*
	yəx̌t	[yɛ́x̌t ~ yʌ́x̌t]	*rib*
	k̓ʷaɬt	[k̓ʷáɬt]	*plate*
	ʔaqʷt	[ʔaqʷt]	*downstream area*
	ƛ̓əx̌ʷt	[ƛ̓ʊx̌ʷt]	*spit*
	t̓aʔq̓t / t̓əq̓t	[t̓áʔq̓t]	*mountain*

t̓

(19) word-initial position

a.	t̓išus-əm	[t̓ɛ́šosəm ~ t̓íšosəm]	*Sliammon* (place name)
	t̓i-t̓šus	[t̓et̓šʸos]	*salt water fish* (at Sliammon)
	t̓igim	[t̓ígim]	*sweet*
	t̓in	[t̓ɛn]	*barbecued salmon*
	t̓ip=ay	[t̓ɛ́pay]	*barbecue meat*
	t̓iš=iqʷ	[t̓íšɛqʷ]	*snot*
	t̓iq̓=nis	[t̓ɛ́q̓nes]	*to sharpen* (a blade)
	t̓imixʷ / t̓iy=mixʷ	[t̓émixʷ] / [t̓íymɩxʷ]	*medicine*
	t̓im̓=ay	[t̓ém̓ay]	*wild cherry tree*
	t̓iyʔəm̓	[t̓éyʔəm]	*wild cherry bark*
b.	t̓uq̓ / tuʔqʷ	[t̓oq̓] / [toʔqʷ]	*Squirrel Cove*
	t̓uʔxʷ=ay	[t̓óʔxʷay ~ t̓óʔxʷʌy]	*grand fir, balsam fir*
	t̓uʔnəxʷ	[t̓ɔ́ʔnəxʷ]	*cattails*
	t̓uɬaɬ	[t̓óɬʌɬ]	*bed*
	t̓ug-əxʷ	[t̓ógʊxʷ]	*to recognize s.b.*

	t̓up-it	[t̓ópɩt] t̓ó:pìtʰ ?	*wind, sundried fish*
	t̓uʔəmt	[t̓óʔəmt]	*paddle*
c.	t̓ap̓=us	[t̓áp̓ɔs]	*blind*
	t̓ap̓as	[t̓áp̓as]	*cave*
	t̓amšin	[t̓ámšɩn]	*twins*
	t̓am̓əxʷ	[t̓ám̓ʊxʷ]	*gooseberry*
	t̓al	[t̓al] t̓əl	*basket ogress*
	t̓aɬəm	[t̓áɬəm ~ t̓áɬˡəm]	*cedar sticks* (for basket)
	t̓ayš	[t̓ayš]	*blanket*
	t̓aqa	[t̓áqa]	*salal berry*
	t̓am-ʔəm	[t̓ámʔəm]	*to guess*
d.	t̓əp=qin-ʔəm	[t̓ə́pqɛn̓əm] n̓	*cook bread by campfire*
	t̓əp=qin	[t̓ə́pqɛn]	*campfire bread*
	t̓ət̓ᶿ-[i]m	[t̓áʔt̓ᶿɛm ~ t̓áʔᵊt̓ᶿɛm]	*red*
	t̓əkʷs	[t̓əkʷs]	*to burst*
	t̓əq̓t	[t̓áʔq̓t]	*mountain*
	t̓əqʷəm	[t̓ʌ́qʷəm]	*thimbleberry*
	t̓əx̌əm	[t̓ʌ́x̌əm]	*six*
	t̓əgəm	[t̓ʌ́gəm]	*moon, sun*
	t̓əg̓əq̓ʷ / t̓əg̓aq̓ʷ	[t̓áʔgʌq̓ʷ]	*clay*

(20) medial position: before vowel (syllable initial)

a.	t̓i-t̓əs-t̓is	[t̓ét̓ə́st̓és]	*any bird*
	t̓ᶿat̓iq̓	[t̓ᶿát̓ɛq̓]	*drop of water, to drip*
	t̓iy-t̓iy=mixʷ / t̓əy-t̓iy=mixʷ	[t̓í:t̓iymɩxʷ]	*lots of medicine*
b.	---t̓u	----	----
c.	t̓aq-t̓aq	[t̓áqt̓aq ~ t̓áqt̓ʌq]	*slow*

	k̓ʷut̓a	[k̓ʷót̓a ~ k̓ʷút̓a]	*barbecuing stick*
d.	t̓i-t̓əq̓-t̓aq̓=aʔaq	[t̓ít̓əq̓t̓aq̓aʔáq] stress!	*barn swallow*
	git̓əx̌ʷ	[gít̓əx̌ʷ]	*Mary Point* (Cortes Island)
	gat̓-ət	[gʌ́t̓ʌt]	*to pry up*

(21) medial position: before a consonant (syllable final)

a.	t̓i-t̓šus	[t̓ét̓šʸos]	*small salt water fish*
b.	---ut̓C	----	----
c.	t̓a-t̓m-an̓aq	[t̓át̓màʔnʌq]	*to imitate s.b.*
d.	xʷət̓=məxʷ	[xʷʊ́t̓mʊxʷ]	*to drop s.t.*
	q̓ət̓x̌ʷ=us	[q̓ʌ́t̓x̌ʷos]	*skull*
e.	x̌ət̓k̓ʷ	[x̌áʔt̓k̓ʷ]	*totem pole*

(22) word-final position

a.	---it̓	----	----
b.	gaʔut̓	[gáʔot̓]	*oar*
	k̓ʷun̓ut̓	[k̓ʷóʔnɔt̓]	*porpoise*
c.	ɬag̓at̓	[ɬáʔgʌt̓]	*herring*
d.	kət̓ / kit̓	[kɩt̓]	*little; little finger*
	kət̓=iqʷ=uǰ̓a	[kɛ́ʔt̓ɛqʷòʔǰɛ]	*pinky, little finger*
	k̓ʷət̓	[k̓ʷʌt̓]	*go upstream*

ƛ

(23) word-initial position

a.	ƛiš=qin	[ƛíšqɛn]	*saliva*
b.	ƛu	----	----
c.	ƛa-ƛapxʷ	[ƛáƛʌpxʷ]	*pocket knife*
	ƛaš-ƛiš-əm	[ƛášƛišəm]	*slimy*

	ƛas	[ƛas]	*glass*
d.	ƛəpx^{w}	[ƛəpx^{w}]	*broke*
	ƛəqəm	[ƛʌ́qʌm]	*grass, straw*
	ƛəqəm=ayaq^{w} / ay̓aq^{w} ?	[ƛʌ́qamàyɛq^{w}] ~ ày̓ʔɛ̀q^{w} ?	*straw hat*
	ƛəs-t	[ƛə́st]	*punch him*
	ƛəɬ-ƛaɬ-ʔm=min	[ƛɩ́ɬƛaɬàʔ^{a}mɛn]	*iron* (for ironing clothes)
	ƛəx̌^{w}-t	[ƛʌ́x̌^{w}t ~ ƛɔ́x̌^{w}t]	*spit it out*
	ƛəm̓ƛəm	[ƛʌ́m̓ƛəm]	*wet*
	ƛəm̓-ət	[ƛáʔmʌt]	*wet it*
	ƛə-ƛ[ə]m̓-ət	[ƛə́ƛaʔmʌt]	*wetting it*

(24) medial position: before vowel (syllable initial)

a.	x̌əƛ=iw̓s	[x̌ʌ́ƛews]	*feather, pluck a bird*
b.	---ƛu	----	----
c.	ƛən̓-ƛan	[ƛɩ́n̓ƛan]	*real shy*
	x^{w}əƛ=aǰ̓u	[x^{w}ʊ́ƛaʔǰu]	*trout, any kind of trout*
d.	p̓əƛ-əm	[p̓ʌ́ƛəm]	*pick fruit*

(25) medial position: before a consonant (syllable final)

a.	----iƛC	----	----
b.	---uƛC	----	----
c.	ƛa-ƛq-t-awɬ	[ƛáƛqatàwɬ]	*whispering to each other*
d.	p̓əƛš=igəɬ / p̓əƛš=igiɬ	[p̓ʌƛšɩ́gɩɬ]	*launch a canoe*
	ƛə-ƛp[ə]x^{w}ət	[ƛə́ƛpəx^{w}ʌt]	*breaking it*

(26) word-final position

a. ---iƛ	----	----
b. ---uƛ	----	----
c. x̌aƛ	[x̌aƛ]	*break* (rope, string)
d. ---əƛ	----	----

ƛ̓

(27) word-initial position

a. ƛ̓iq̓iw	[ƛ̓ɛ́q̓ɛw]	*dark*
ƛ̓iʔƛ̓i	[ƛ̓ɛ́ʔƛ̓ɛ]	*fast*
ƛ̓ip=qin	[ƛ̓ɛ́pqɛn]	*lower lip*
ƛ̓ip=itᶿa	[ƛ̓ɛ́petᶿʌ ~ ƛ̓ɛ́pitᶿa]	*woman's slip*
ƛ̓in̓a	[ƛ̓ɛ́ʔna ~ ƛ̓ɛ́n̓a]	*oolichan oil*
b. ƛ̓um-it	[ƛ̓ómet] ƛ̓ó:mèt ?	*enough*
ƛ̓u-ƛ̓ɬ=ay-əm	[ƛ̓óƛ̓ɬáyəm]	*adopted child*
ƛ̓uɬ	[ƛ̓ɔɬ]	*to grow* (as plant)
ƛ̓u-ƛ̓uɬ	[ƛ̓óƛ̓ɔɬ]	*s/he is growing*
ƛ̓up	[ƛ̓ɔp]	*to heal*
c. ƛ̓aqt	[ƛ̓aqt]	*long*
ƛ̓aʔɬʔum / ƛ̓ʔɬum̓	[ƛ̓áʔɬʔɔm] / [ƛ̓ɑ́ʔɬom̓]	*wolf*
ƛ̓aɬəm	[ƛ̓áɬəm]	*salt*
ƛ̓ax̌=ay	[ƛ̓áx̌ay]	*elder (most respectful term)*
ƛ̓ay-ət / ƛ̓ay-at	[ƛ̓áyʌt] / [ƛ̓áyɛt ~ ƛ̓áyʌt]	*hold it*
ƛ̓a-ƛ̓ay-a-t-as	[ƛ̓áƛ̓ayètʌs]	*s/he is holding it*
d. ƛ̓əp	[ƛ̓ʌp]	*deep*
ƛ̓əqʷ	[ƛ̓ʌqʷ]	*hard, solid*
ƛ̓əq̓	[ƛ̓ʌq̓]	*rotten*
ƛ̓əq	[ƛ̓ʌq]	*to go outside*

ƛ̓əkʷ=inas	[ƛ̓ʊ́kʷénʌs]	*heart*
ƛ̓əq̓=šin	[ƛ̓ʌ́q̓šɩn]	*mocassins*
ƛ̓əq̓ʷ=tən / ƛ̓əqʷtan	[ƛ̓ʊ́q̓ʷtʌn] / [ƛ̓ɔ́qʷtan]	*wall*
ƛ̓əx̌ʷ=ay	[ƛ̓ʌ́x̌ʷʌy ~ ƛ̓ɔ́x̌ʷʌy]	*chum, dog salmon*
ƛ̓əms=tən	[ƛ̓ʌ́mstʌn]	*village*
ƛ̓əs[i]m	[ƛ̓ɩ́sɛm]	*green, yellow, orange*
ƛ̓əm̓-ƛ̓əm	[ƛ̓ə́m̓ƛ̓əm]	*square*

(28) medial position: before vowel (syllable initial)

a.	---ƛ̓i---	----	----
b.	---ƛ̓u---	----	----
c.	x̌ʷəƛ̓=ay	[x̌ʷɛ́ƛ̓ay]	*mountain goat*
	kʷup=ƛ̓ač	[kʷúpƛ̓əč ~ kʷúpƛ̓ač]	*Hernando Island*
	ƛ̓a-ƛ̓at[i]x̌	[ƛ̓áƛ̓atɛ̀x̌ ~ ƛ̓áƛ̓ʌtɛ̀x̌]	*grasshopper* (dim.)
d.	ƛ̓əm-ƛ̓əms	[ƛ̓ə́mƛ̓əms]	*many houses, village*
			village at head of Toba Inlet

(29) medial position: before a consonant (syllable final)

a.	k̓ʷiƛ̓t	[k̓ʷiƛ̓t]	*upstream area*
b.	k̓ʷuƛ̓=kʷu	[k̓ʷúƛ̓kʷu]	*salt water*
c.	ƛ̓a-ƛ̓x̌=ay+[ʔ]	[ƛ̓áƛ̓x̌ʌy̓]	*old person* (cf. ƛ̓áx̌ay *elder*)
d.	x̌ʷəƛ̓-x̌ʷəƛ̓=ay	[x̌ʷə́ƛ̓x̌ʷəƛ̓ày]	*Goat Lake*
	məƛ̓=nač	[mə́ƛ̓nʌč ~ mʌ́ƛ̓nač]	*Mitlenatch Island*

(30) word-final position

a.	č̓i-č̓iƛ̓	[č̓íč̓iƛ̓] ~ č̓í:	*short*
	q̓əǰ[i]ƛ̓ / q̓aǰ[i]ƛ̓	[q̓ʌ́ǰɩƛ̓]	*scar, a scar*
b.	---uƛ̓	----	----
c.	x̌aƛ̓	[x̌áƛ̓]	*want*

d.	məƛ̓	[mʌƛ̓]	*calm water*
	ǰəƛ̓	[ǰɩƛ̓]	*run*
e.	q̓aʔƛ̓	[q̓aʔƛ̓]	*otter*

č

(31) word-initial position

a.	či-čiya+ʔ	[čɩ́čiyɛʔ ~ čɩ́č^{ɩ}yɛʔ]	*grandmother*
	čiya	[čɩ́yɛ ~ čɩ́ya]	*grandmother, granny*
	čiǰ̓[i]x^{w} / čaǰ̓[i]x^{w}	[čɛ́ʔǰɩx^{w}]	*loose*
	čigitəm	[čɩ́gɩ́təm]	*soon*
b.	čuy̓ cf. /čuǰ̓/	[čúy̓]	*baby, child*
c.	čayiš	[čéyɩš]	*arm, hand*
d.	čəy̓-čuy̓ cf. /čuǰ̓/	[čɩ́:čuy̓ ~ čɩ́:čʊy̓]	*children*

(32) medial position: before vowel (syllable initial)

a.	t̓^{θ}əčil̓i	[t̓^{θ}ə́čél̓e]	*kingfisher*
	k^{w}it=ičən=šən /k̓^{w}	[k^{w}ɩ́tičɩnšɩn]	*top of foot*
	či-čiya+ʔ	[čɩ́čiyɛʔ ~ čɩ́č^{ɩ}yɛʔ]	*grandmother*
	hig=čis-ma	[hɛ́w̓čisma]	*paddle with one paddle*
b.	pəču	[pɩ́ču ~ pɩ́ču ~ pɛ́ču]	*basket (generic)*
	pi-pču+ʔ	[pípčoʔ ~ pépčɔʔ]	*small basket*
c.	pəq-aɬ-čayiš	[pʌ̀qaɬčéyɩš]	*palm*
	čəy-čayiš	[čɩ́čeyɩš]	*arms, hands (pl)*
d.	waʔč=aw̓tx^{w}	[wáʔčəw̓tx^{w} ~ wá·čuʔtx^{w}]	*bathroom*
	ʔinčən	[ʔɛ́nčɩn]	*motor* (< English *engine*)

(33) medial position: before a consonant (syllable final)

a.	θičmus	[θíčmɔ́s]	*back of house*
b.	učC	----	----
c.	ɬay=nač=tən	[ɬáynàčtən]	*skirt*
d.	ǰi:=nač-t ?	[ǰí:nʌčt]	*to coil up*

(34) word-final position

a.	tal̓[i]č	[tál̓ɩč]	*round*
	q̓iʔič	[q̓έʔεč]	*moose*
	x̌iʔič	[x̌éʔeč]	*salmon after spawning*
b.	---uč	----	----
c.	nəp=ƛ̓ač	[nʌ́pƛ̓ʌč]	*guts*
	p̓aq̓=nač	[p̓áq̓nʌč]	*Canada goose*
d.	maθač	[máθʌč]	*cormorant, helldiver*
	xʷum̓yəč	[xʷúm̓yɩč]	*skin*
	kʷəw̓əč	[kʷʊ́w̓ʊč]	*sturgeon*

č̓

(35) word-initial position

a.	č̓i-č̓tiy̓əx̌	[č̓íč̓tⁱy̓ə̀x̌]	*sandpiper*
	č̓əyk̓-[a]ʔamin	[č̓ík̓aʔʌ̀mɩn]	*frying pan*
b.	č̓uʔ-č̓uʔ	[č̓ɔ́ʔč̓ɔʔ]	*wren*
c.	č̓ag=’ay	[č̓έʔgʌy ~ č̓áʔᵃgay]	*wooden spoon*
	č̓ag=tən	[č̓έwtən]	*helper* (the elders' helper)
	č̓an̓u	[č̓έʔno]	*dog*
d.	č̓əx̌	[č̓ʌx̌]	*ripe, cooked*
	č̓əɬ	[č̓ɩɬ]	*rain*
	č̓əɬ=ayaqʷ	[č̓ɩ́ɬayεqʷ ~ č̓έɬayεqʷ]	*rain hat*

		č̓əɬ=nač	[č̓έɬ^{ə}nač]	*rain pants*
		č̓əq	[č̓ʌq]	*tiny bird, robin*
		č̓əq̓	[č̓εq̓ ~ č̓ʌq̓]	*fence*
		č̓əʔ=umix^{w}=tn	[č̓óʔomὲx^{w}tən]	*floor rug, carpet*
(36)	medial position: between vowels (syllable initial)			
	a.	x̌ič̓-ič̓	[x̌έč̓ič̓]	*Fall, Autumn*
		t̓^{θ}əč̓=əɬp=ay	[t̓^{θ}áʔč̓ɩɬpʌy]	*Sitka spruce*
		məč̓in=tən	[máʔč̓̀intən ~ tn̩]	*fine-toothed comb*
	b.	ƛ̓ič̓us	[ƛ̓í:č̓os ~ ƛ̓í:č̓ʊs]	*Spring (season)*
		mač̓usay̓a / məč̓-	[máč̓usàʔyε]	*flea*
	c.	č̓a-č̓ag-a-θ-as	[č̓έč̓εgàθʌs]	*s/he is helping me*
		č̓a-č̓at̓an	[č̓έč̓εt̓ʌn ~ č̓έč̓æt̓ən]	*mouse*
		səč̓əy=uk^{w}t	[sáʔč̓ʌyʔʊ̀k^{w}t^{h}]	*leather coat*
	d.	ɬič̓-ət	[ɬíč̓ɩt]	*comb it* (hair)
		q̓ač̓əm	[q̓ač̓əm]	*to bite*
(37)	medial position: after a consonant (syllable initial)			
	a.	səč̓əy	[sáʔč̓i]	*tanned leather hide*
		gəč̓=iq^{w}an	[gʌ́č̓εq^{w}ən]	*bald, partially bald*
	b.	t̓^{θ}aʔč̓us	[t̓^{θ}áʔč̓us ~ t̓^{θ}áʔ^{a}č̓ɔs]	*mosquito*
	c.	p̓al̓asč̓ən /p̓al̓asč̓in	[p̓áʔ^{ə}lasč̓ɩn]	*pine cones*
(38)	medial position: before a consonant (syllable final)			
	a.	č̓i-č̓tiyax̌=uɬ	[č̓íč̓tiyax̌òɬ]	*small sandpiper*
	b.	uč̓C	----	----
	c.	q^{w}ač̓t	[q^{w}ač̓t]	*to burp, to belch*
	d.	ƛ̓əč̓t	[ƛ̓íč̓t]	*sleep*

	k̓ʷəč̓-k̓ʷač̓	[k̓ʷíč̓k̓ʷač̓ʰ]	*lots of dogfish (pl.)*

(39) word-final position

a.	x̌ič̓-ič̓	[x̌éč̓ič̓]	*Fall, Autumn*
b.	uč̓	----	----
c.	p̓aʔač̓	[p̓áʔač̓ ~ p̓áʔʌč̓]	*fishing net*
	k̓ʷač̓	[k̓ʷáč̓]	*dogfish*
d.	θəč̓	[θɩč̓]	*straight*

k

(40) word-initial position

a.	kiks	[kiks]	*cookie* (< English *cakes*)
b.	kul=aw̓txʷ	[kʷúlaw̓txʷ]	*school* (cf. kʷul / kul school)
c.	kapi	[kápi ~ kʸápi]	*coffee*
	kamputs	[kǽmpùts]	*rubber boots*
	kanti	[kǽntɛ]	*candy*
d.	kəpəm	[kʸɩ́pəm ~ kɩ́p:əm]	*button*
	kət̓	[kɩt̓]	*small finger, pinky*
	kət̓=iqʷ=uǰ̓a	[kʸɛ́t̓eqʷòʔǰɛ]	*little finger, pinky*
	kək-kiks	[kɩ́kkiks]	*lots of cookies*
	kənika	[kɩ́nikɛ ~ kɩ́nɛkʌ]	*coloured person*

(41) medial position: before a vowel (syllable initial)

a.	kikiʔ	[kí:kɛʔ ~ kí:kʸɛʔ]	*bug*
	takin	[tǽkɩn]	*stocking, sock*
	takin=ayuqʷ /-ay̓uqʷ	[tákʸinàyoqʷ]	*knitted toque*
		[tákʸənày̓ʊqʷ]	

b. titul=kʷum | [tí:tɔlkʷùm] | *small roots*

c. ---ka

d. ---kə

(42) medial position: before a consonant (syllable final)

a.	kiks	[kíks]	*cookie* (< English *cakes*)
b.	ukC	----	----
c.	hənkƛ̓ala / hən̓kƛ̓ala	[hə́nkƛ̓àla ~ hʌ́n̓kƛ̓ala]	*pot (cook in)*
	hənkala /hən̓k̓ala	[hə́nkɛla ~ hə́n̓k̓ʸɛla]	*pot (cook in)*
d.	ləkli	[lɩ́klɛ]	*key*
	tək-takin	[tɩ́ktæ̀kɩn]	*stockings (pl)*

(43) word-final position

a.	ik	----	----
b.	uk	----	----
c.	ak	----	----
d.	p̓əθk	[p̓əθk]	*bullhead* (fish)

k̓

(44) word-initial position

a.	k̓i-k̓čaʔ	[k̓ɛ́k̓čɛʔ]	*small basket for sewing*
	k̓iltust	[k̓éltɔst]	*to hang s.t. up*
	k̓ig-k̓igəm	[k̓ɛ́wk̓egɩm]	*coyote*
	k̓il[i]θ	[k̓élɩθ]	*crooked* (cf. k̓əlθ-)
b.	k̓u	----	----
c.	k̓aʔəm kʷ k̓i-k̓ik̓	[k̓ʸáʔʌm kʷ k̓ík̓ɩk̓]	*the crows are crowing*
d.	k̓əp̓ayəxʷ	[k̓íp̓ayʊxʷ]	*scissors*

	k̓əlθ=iqʷ	[k̓ʌ́lθɛqʷ]	*crooked nose*

(45) medial position: before vowel (syllable initial)

a.	wa-wak̓ila	[wàwak̓íla]	*limpets*
	wik̓al̓i ?	[wík̓ɛʔlɛ ~ wík̓aʔlɛ]	*hermit crab*
b.	x̌ay-x̌əyk̓us / x̌əy-x̌əyk̓us	[x̌áyx̌ek̓ʷus]	*nightmare*
c.	č̓əyk̓-[a]ʔamin	[č̓ík̓aʔʌmɪn]	*frying pan*
d.	---k̓ə	----	----

(46) medial position: before a consonant (syllable final)

a.	k̓i-k̓čaʔ	[k̓ɛ́k̓čɛʔ]	*small basket for sewing*
b.	--uk̓C	----	----
c.	--ak̓C	----	----
d.	--ək̓C	----	----

(47) word-final position

a.	t̓əl[i]k̓ (: t̓álɪk̓)	[t̓ə́lɛk̓ ~ t̓ə́lɪk̓]	*a hole*
	k̓i-k̓ik̓	[k̓í:k̓ik̓ ~ k̓ík̓ɛk̓]	*crow*
	ti-tik̓	[títik̓]	*skinny*
b.	---uk̓	----	----
c.	---ak̓	----	----
d.	---ək̓	----	----

kʷ

(48) word-initial position

a.	kʷiš-kʷiš	[kʷíškʷiš ~ kʷíškʷιš]	*Steller's jay* (blue jay)
b.	kʷus-[i]m	[kʷúsɛm]	*green, blue*
	kʷusən / kʷusin	[kʷúsən ə ~ ι ~ ɛ]	*star*
	kʷumaʔ	[kʷúmaʔ]	*ratfish*
c.	kʷasəm	[kʷásəm]	*grouse*
d.	kʷətəm	[kʷə́təm]	*get sick*
	kʷən̓ / kʷan̓	[kʷʌ́n̓]	*that*
	kʷəy̓	[kʷiʔ ~ kʷəy̓]	*morning*
	qəǰi kʷəy̓	[qʌ́ǰi kʷiʔ]	*early morning*
	kʷəy̓=min	[kʷə́ymιn]	*breakfast*
	kʷəw̓əč	[kʷáʔᵊwιč ~ kʷʊ́w̓ʊč]	*sturgeon*

(49) medial position: before a vowel (syllable initial)

a.	hi-hkʷiʔiqʷ	[hɛ́hkʷiʔɛqʷ]	*great-great-grandmother*
	ɬukʷ=igiL=tən	[ɬúkʷigìytən]	*canoe bailer*
b.	k̓ʷuƛ̓=kʷu	[k̓ʷúƛ̓kʷu]	*salt water*
	sin=kʷu	[sénkʷu ~ sénkʷo]	*ocean*
	saL'=kʷum	[sáw̓kʷum]	*two (cedar) roots*
c.	nukʷ=ay=mixʷ	[nókʷàymιxʷ]	*population of village*
	nikʷ=ayu	[níkʷayu]	*lamp*
	ni-nkʷ=ayu+ʔ	[nínkʷàʔyu]	*small lamp*
d.	səkʷ-əm /sukʷ-um	[sʊ́kʷʊm]	*to shiver*
	qəkʷ-m-aθut	[qʌ́kʷᵊmaθotʰ]	*stop doing s.t.*
	k̓ʷu-k̓ʷuyukʷ-əm	[k̓ʷúk̓ʷoyùkʷʊm]	*trolling*
	pəlkʷ-ət	[pə́lkʷʌt]	*to roll s.t. over*

(50)		medial position: before a consonant (syllable final)		
	a.	...ikʷC	----	----
	b.	pukʷ-pukʷ	[púkʷpukʷ]	*books*
	c.	---akʷC	----	----
	d.	təkʷ-təkʷɬi	[tʊ́kʷtʊkʷɬe]	*rabbits (pl.)*
		θəkʷ-θəkʷ=nač=tən	[θʊ́kʷθʊkʷᵊnàčtn̩]	*chairs (pl.)*
		həkʷ-t ga tə θ kapu	[hə́kʷtᵊ gʌ təθ kʸɛ́·po]	*hang up your coat* (request)
	e.	ti-tkʷɬi+ʔ	[títkʷɬeʔ]	*small rabbit*

(51)		word-final position		
	a.	saỷikʷ	[sáỷɩkʷ ~ sáʔyɩkʷ]	*tide flats*
	b.	pukʷ	[pukʷ]	*book* (< English *book*)
		k̓ʷuyukʷ	[k̓ʷóyʊkʷ]	*fish hook, troll*
		ɬan̓ukʷ	[ɬáʔᵃnʊkʷ]	*animal hide*
	c.	q̓aykʷ	[q̓áykʷ]	*bald-headed eagle*
		q̓ʷit=iyaʔkʷ	[q̓ʷɛ́tiyɛʔkʷ]	*front yard* (facing beach)
	d.	məθkʷ	[məθkʷ]	*blackcap berry*
		məkʷ-t	[mʊ́kʷtʰ]	*taste it, eat it*
		ǰətkʷ	[ǰɩ́tkʷ]	*shake*

k̓ʷ

(52)		word-initial position		
	a.	k̓ʷin	[k̓ʷɛn]	*how many*
		k̓ʷiƛ̓t	[k̓ʷiƛ̓t]	*upstream area*
		k̓ʷit=igs	[k̓ʷɛ́:tews]	*vest*
	b.	k̓ʷuʔuxʷ	[k̓ʷóʔoxʷ ~ k̓ʷúʔʊxʷ]	*smoked salmon, fish*
		k̓ʷuʔuxʷ=aw̓txʷ	[k̓ʷúʔoxʷàwtxʷ]	*smoke house*
		k̓ʷut̓a	[k̓ʷót̓a ~ k̓ʷút̓a]	*barbecuing stick*

	k̓ʷun̓ut̓	[k̓ʷóʔnɔt̓]	*porpoise*
	k̓ʷuɬ=ʔay	[k̓ʷóɬʔay ~ k̓ʷóɬay]	*maple tree*
c.	k̓ʷas	[k̓ʷas]	*hot*
	k̓ʷas=ixʷθaɬ	[k̓ʷásexʷθʌɬ]	*burn one's tongue*
	k̓ʷač̓	[k̓ʷač̓]	*dogfish*
	k̓ʷaxʷa	[k̓ʷáxʷa]	*box*
	k̓ʷaw̓a	[k̓ʷáʔwa]	*belly, stomach*
d.	k̓ʷət̓	[k̓ʷə́t̓]	*go upstream*
	k̓ʷəč̓-k̓ʷač̓	[k̓ʷɩ́č̓ʰk̓ʷač̓ʰ]	*lots of dogfish (pl.)*
	k̓ʷəʔsta	[k̓ʷáʔsta]	*cup*
	k̓ʷi-k̓ʷəʔsta	[k̓ʷé·k̓ʷaʔsta]	*small cup*
	k̓ʷəs-əm	[k̓ʷə́səm]	*toasted herring*
	k̓ʷəs-ʔəm	[k̓ʷə́sʔəm]	*cook herring over open fire*
	k̓ʷəɬ	[k̓ʷə́ɬ]	*spill*
	k̓ʷəɬt (k̓ʷaɬt ??)	[k̓ʷʌ́ɬt]	*plate, tray*
	k̓ʷəšt	[k̓ʷʊšt ~ k̓ʷɩšt]	*to count s.t.*

(53) medial position: before a vowel (syllable initial)

a.	t̓ᶿuk̓ʷi=kʷu	[t̓ᶿɔ́k̓ʷékʷɔ]	*to dip up water*
b.	k̓ʷəy-k̓ʷuyukʷ	[k̓ʷí·k̓ʷùyəkʷ ~ ʊkʷ]	*lots of fish hooks*
c.	xʷuk̓ʷ=ayin	[xʷú:k̓ʷàyɩn]	*skunk cabbage*
	k̓ʷa-k̓ʷamiθ	[k̓ʷák̓ʷamɩθ]	*weasel*
	k̓ʷi-k̓ʷač̓	[k̓ʷéᵊk̓ʷač̓ʰ ~ k̓ʷéʔk̓ʷač̓ʰ]	*small dogfish*
d.	k̓ʷi-k̓ʷəč̓-k̓ʷač̓	[k̓ʷík̓ʷɩč̓ʰk̓ʷač̓ʰ]	*lots of small dogfish* (dim.pl.)
	ɬik̓ʷ-ʔəm Intr.	[ɬík̓ʷəm ~ ɬík̓ʷʊm]	*to sew (s.t.)*
	ɬik̓ʷ-ət	[ɬík̓ʷɩtʰ]	*sew it*

(54) medial position: before a consonant (syllable final)

a.	ɬik̓ʷ=ƛ̓ač	[ɬík̓ʷƛ̓ač]	*gunny sack*
	ɬik̓ʷ=ǰan	[ɬík̓ʷǰɛn]	*to repair a net*
b.	k̓ʷu-k̓ʷɬ=ay+[ʔ]	[k̓ʷúk̓ʷɬay̓]	*small maple tree*
c.	k̓ʷa-k̓ʷθəm	[k̓ʷák̓ʷθʌm]	*to tell news*
d.	tək̓ʷ-tək̓ʷ-t-as	[tʌ́k̓ʷtʊk̓ʷtʌs]	*they are pulling it*
	tək̓ʷ-tək̓ʷ-t ga	[tʊ́k̓ʷtʊk̓ʷtᵊga]	*pull them all up!*
	ǰək̓ʷ-t	[ǰək̓ʷt]	*rub it*

(55) word-final position

a.	ʔi-ʔagik̓ʷ	[ʔíʔagik̓ʷ ~ ʔéʔagik̓ʷ]	*clothes*
	t̓ᶿi-t̓ᶿik̓ʷ	[t̓ᶿé·t̓ᶿek̓ʷ]	*worm*
b.	t̓ᶿuk̓ʷ	[t̓ᶿok̓ʷ]	*day*
	t̓ᶿuk̓ʷ-uk̓ʷ	[t̓ᶿók̓ʷuk̓ʷ]	*becoming day*
	ǰuk̓ʷ / ǰuʔk̓ʷ	[ǰuk̓ʷ ~ ǰuʔk̓ʷ]	*Indian rice*
	wuk̓ʷ	[wuk̓ʷ]	*scoop net*
	ɬuk̓ʷ	[ɬuk̓ʷ]	*to fly*
c.	ɬak̓ʷ	[ɬak̓ʷ]	*to swell up*
d.	ǰək̓ʷ	[ǰək̓ʷ]	*get rubbed*
e.	qəmk̓ʷ	[qʌmk̓ʷ]	*to capsize, tip over*
	ʔuwk̓ʷ	[ʔú:k̓ʷ]	*all*

(56) between consonants

a.	x̌ət̓k̓ʷ-s	[x̌ʌ́t̓k̓ʷs]	*its design*

Note: The contrast between /q/ and /qʷ/ is neutralized in favour of [qʷ] in the environment of the round vowel /u/. There are many examples of qʷ in the environment of u but it is very difficult to find cases of q in the environment of u. The contrasts between /q̓/ and /q̓ʷ/, and /x̌/ and /x̌ʷ/ are also neutralized in this context in favour of the labialized allophones [q̓ʷ] and [x̌ʷ].

q

(57) word-initial position

a.	qiyup	[qéyʊp ~ qéiyʊp]	*stern of a boat*
	qigaθ	[qégaθ ~ qégʌθ]	*deer*
b.	qu	----	----
c.	qaw̓um	[qáʔwʊm]	*eye*
	qaymixʷ	[qáymɪxʷ]	*person*
	qayx̌	[qayx̌]	*Mink (stage name)*
	qayx̌a=ƛ̓ač	[qáyx̌aƛ̓ač ~ qáyx̌aƛ̓ʌč]	*kidney*
d.	qəp=iws-əm	[qə́pewsəm]	*make the sign of the cross*
	qəx̌	[qʌx̌]	*many*
	qəǰi	[qʌ́ǰi]	*again*
	qəms-at-uɬ št	[qʌ́msatòɬštʰ]	*we stored it away*
	qəms-[a]ʔm=min=aya	[qʌ́msàʔᵊmɛnàyɛ]	*cupboard*
	qəy̓a	[qáʔyɛ]	*water*

(58) medial position: before a vowel (syllable initial)

a.	ɬəx̌=qin	[ɬʌ́x̌qɛn]	*raspy throat*
	tiqiw	[tɛ́qɛw]	*horse*
b.	---qu	----	----
c.	t̓aqa	[t̓áqa]	*salal berry*
	qi-qap̓=awus	[qɛ́qap̓awᶷs] stress	*bat*
	pəq-aɬ=šən	[pʌ́qaɬšɪn]	*bottom of foot*
d.	ɬəq-amin /ɬq-ʔm=min/	[ɬʌ́qʌmɛn] / [ɬʌ́qʌ́men]	*war spear*
	ɬəq=iqʷa(n)-t	[ɬʌ́qeqʷʌt]	*spear it on the head (codfish)*

(59) medial position: before a consonant (syllable final)

a.	hiqs-amin	[hɛ́q̓sʌ́mɛn]	*canoe pole*
b.	--uqC	----	----
c.	ƛ̓aq-ƛ̓aq-ʔəm	[ƛ̓áqƛ̓aqʔəm]	*whispering (s.t.)*
d.	məqsən	[mʌ́qsɩn ~ mʌ́qsɛn]	*nose*
	šəq-θut	[šʌ́qθot]	*sigh*
	t̓əq-t čax^{w}	[t̓ʌ́qt^{h} čɛ̆x^{w}]	*you paste it on, glue it*

(60) word-final position

a.	pi:piyiq	[pé:péyeq]	*sledge hammer*
b.	---uq	----	----
c.	RED-say-n=aq (~ also =aq̓)	[sísay^{ə}nʌq]	*groin, pubic area*
d.	piləq	[pé^{ə}lʌq]	*mushroom, bracket fungus*
	pəq	[pʌq]	*white*
	ƛ̓əq	[ƛ̓ʌq]	*out*
	t̓^{θ}əmtəq	[t̓^{θ}ə́mtʌq]	*oolichans*

q̓

(61) word-initial position

a.	q̓is-it	[q̓ɛ́:sɛt]	*to tie s.t.*
	q̓ix̌=iq^{w}an-əm	[q̓ɛ́x̌eq^{w}ʌnəm]	*dye hair*
	q̓i-q̓əʔga	[q̓ɛ́q̓ɑʔgʌ]	*small walking stick*
b.	q̓u---	----	----
c.	q̓at̓an	[q̓át̓an ~ q̓át̓ən]	*rat*
	q̓aʔut̓^{θ}	[q̓áʔot̓^{θ}]	*uvula, glutton*
	q̓ayk^{w}	[q̓áyk^{w}]	*bald eagle*
d.	q̓əs-q̓əs	[q̓ʌ́sq̓ʌs]	*tired of sitting*
	q̓əs=ƛ̓ač	[q̓ə́sƛ̓æč]	*laughed so hard*

	q̓əʔga	[q̓ɑ́ʔgʌ]	*walking stick, cane*
	q̓əʔga-ha-ha čx^w	[q̓ɑ́ʔga·hàhʌčx^w]	*Have you got yr. cane?*
	q̓əw-q̓əʔga	[q̓ə́^wwq̓ɑʔgʌ ~ q̓ɔ́wq̓ɑʔgʌ]	*lots of walking sticks*

(62) medial position: before a vowel (syllable initial)

a.	gaq̓-it	[gáq̓ɛt]	*it's opened*
b.	x̌^wat̓q̓^wum	[x̌^wát̓q̓^wom]	*thunder*
c.	ʔa-ʔaq̓-ə(t) č	[ʔáʔaq̓ʌč]	*I'm chasing him*
	q̓ə-q̓ayas	[q̓ʌ́q̓ayʌs]	*barrel*
	q̓əy-q̓ayk^w	[q̓ə́^yq̓ayk^w]	*eagles* (pl)
	p̓əq̓=aya	[p̓áʔq̓ayɩ ~ p̓áʔq̓ayɛ]	*stove pipe* (cf. p̓əq̓ *smoke*)
d.	pəɬq̓-əm	[pʌ́ɬq̓əm]	*slippery*

(63) medial position: before a consonant (syllable final)

a.	tiq̓=tn	[t̓ɛ́q̓tn̩]	*bay at Whaletown* (Cortes)
b.	---uq̓C	----	----
c.	k̓^waq̓t	[k̓^waq̓t]	*to scream*
d.	səq̓-t	[sʌ́q̓t]	*peel off s.t.*
	ƛ̓əq̓=šin	[ƛ̓ʌ́q̓šin]	*moccasins*
	yəq̓-t-uɬ čən	[yʌ́q̓toɬčɩn]	*I bought it*
	məq̓-mut	[mʌ́q̓mʊt^h]	*really full (from eating)*

(64) word-final position

a.	x̌i-x̌niq̓	[x̌ɛ́x̌^ənɛ̀q̓]	*owl*
	x̌i-ʔi-x̌niq̓	[x̌ɛ́ʔɛx̌nɛq̓]	*Owl's Grove; sacred place*
	p̓iq̓ t̓uɬaɬ	[p̓ɛ́q̓ t̓óɬaɬ]	*wide bed*
b.	---uq̓	----	----
c.	---aq̓	----	----

d.	p̓əq̓	[p̓ʌ́q̓]	*smoke from fire*
	ƛ̓əq̓	[ƛ̓ʌ́q̓]	*rot*
	č̓əq̓	[č̓ɛ́q̓ ~ č̓ʌ́q̓]	*fence*
	səq̓	[sʌ́q̓]	*fifty cent piece; half*
	məq̓	[mʌ́q̓]	*full (from eating)*

qʷ

(65) word-initial position

a.	qʷiq̓ʷəm	[qʷɛ́q̓ʷəm]	*to nail* (s.t.)
b.	qʷuwit	[qʷówɩt]	*beaver*
	qʷuθ=nač=tən	[qʷóθᵊnàčtɩn ~ tn̩]	*cushion*
c.	qʷaw̓it	[qʷáʔwɩɬ ~ qʷáʔwɛɬ]	*pitch, chewing gum*
	qʷaʔɬ	[qʷaʔɬ]	*raspberry*
	qʷasəm	[qʷásəm ~ qʷásʌm]	*flower*
d.	qʷəl̓	[qʷʌ́l̓]	*he, she, they came*
	qʷənis	[qʷʌ́nes ~ qʷə́nɩs]	*whale (humpback not orca)*
	qʷəɬ=ay̓=šn	[qʷə́ɬeʔšɨn]	*shoes*

(66) medial position: before a vowel (syllable initial)

a.	ʔaqʷiš	[ʔáqʷeš]	*go downstream*
b.	hanaqʷus / hanaqʷ=us	[hánaqʷos]	*wolf eel; aggressive*
c.	t̓uqʷ=an̓a	[t̓úqʷaʔna ~ t̓óqʷaʔna]	*snail, deaf*
d.	t̓uqʷəm	[t̓óqʷəm]	*redcaps, thimbleberries*
e.	qʷə-qʷəl̓	[qʷɔ́qʷʌl̓]	*coming*
f.	qʷəqʷ-t tə laspul	[qʷɔ́qʷtʰ tə láspol]	*head the ball!* (soccer)

(67) medial position: after a consonant and before a vowel (syllable initial)

a.	Cqʷi	----	----
b.	qʷup-qʷup=awus	[qʷópʰqʷopàwʊs]	*eyelashes* (pl)
c.	qʷəy̓-qʷay	[qʷə́y̓qʷay]	*talkative*
	qʷəs-qʷasəm	[qʷə́sqʷàsəm]	*lots of flowers*
d.	Cqʷə	----	----

(68) medial position: before a consonant (syllable final)

a.	qʷan̓=iqʷɬa	[qʷáʔᵊnɛqʷɬa]	*knee*
b.	ɬuqʷmut	[ɬóqʷmot]	*saps running*
	qʷuqʷʔ-aɬ=kʷu	[qʷóqʷʔaɬkʷu ~ ʌɬ]	*soup, any kind of soup*
c.	qʷa-qʷy-in̓at ??	[qʷáqʷyɛ́n̓ʌt]	*to coax s.b.*
d.	qʷə-qʷwəx̌	[qʷʌ́qʷwəx̌]	*duck, any duck*
	qʷa-qʷwəx̌	[qʷáqʷᵊwʌ̀x̌]	*duck, any duck*
	həqʷ-t ga	[hʌ́qʷtᵊ gʌ]	*smell it!*

(69) word-final position

a.	č̓a-č̓amiqʷ	[č̓ɛ́č̓ɛmɛqʷ ~ č̓ɛ́č̓ɛmeqʷ]	*great-grandparent*
	t̓in̓iqʷ	[t̓ɛ́ʔnɛqʷ]	*salmonberries*
	masiqʷ	[másɛqʷ ~ mʌ́sɛqʷ]	*purple sea urchin*
	q̓aqiqʷ	[q̓áqɛqʷ]	*sea wrack, bladder wrack*
	qəy̓iqʷ	[qé·ʔɛqʷ]	*any kind of fruit juice*
b.	ƛ̓uqʷ	[ƛ̓oqʷ]	*hard*
	θəǰapuqʷ	[θɪ́ǰæpoqʷ ~ θɪ́ǰɛpoqʷ]	*hat*
c.	č̓əɬ=ayaqʷ	[č̓ɪ́ɬayɛqʷ ~ č̓ɛ́ɬayɛqʷ]	*rain hat*
d.	haǰəqʷ	[háǰʊqʷ]	*to dig (a pit)*
	haǰəqʷ / haǰaqʷ	[háǰʌqʷ]	*to steam-cook*
	ǰəqʷ-ǰəqʷ	[ǰɔ́qʷᵊǰɔqʷ]	*warm, tempid*

e.	t̓ᶿamqʷL	[t̓ᶿámqʷɬ]	*cloud*

q̓ʷ

(70) word-initial position

a.	q̓ʷit	[q̓ʷɛt]	*beach*
	q̓ʷit-ɬ=šin	[q̓ʷíƛšɩn]	*starfish* (beach=foot, leg)[1]
	q̓ʷitax̌an	[q̓ʷɛ́:tàx̌ʌn]	*front of house* (faces beach)
b.	q̓ʷuw=an̓a	[q̓ʷówᵊʔana ~ q̓ʷòwaʔána]	*ear*
c.	q̓ʷalas / q̓ʷaləs	[q̓ʷálʌs]	*raccoon*
	q̓ʷaj̓x̌	[q̓ʷʌ́y̓x̌ ~ q̓ʷéy̓x̌]	*wood, firewood*
d.	q̓ʷəsʔi	[q̓ʷə́sʔi]	*lung*
	q̓ʷəƛ̓-q̓ʷiƛ̓=šin	[q̓ʷʊ́ƛ̓q̓ʷɛƛ̓šin]	*starfish* (pl.)
	q̓ʷətəm	[q̓ʷʌ́tʌm]	*river*
	q̓ʷəx̌-t ga tə qigaθ	[q̓ʷʌ́x̌tᵊ gʌ tə qé·gʌθ]	*butcher the deer!* (cf. *fillet*)
	q̓ʷəx̌	[q̓ʷʌ́x̌]	*slough*

(71) medial position: before a vowel (syllable initial)

a.	x̌ʷuq̓ʷ-it	[x̌ʷó:q̓ʷɛt] : x̌ʷó:q̓ʷɛ̀t	*s.o. snoring*
b.	q̓ʷəw̓-q̓ʷuw=an̓a	[q̓ʷóq̓ʷowᵊʔana]	*ears* (pl)
	puq̓ʷ=us=tən	[póq̓ʷostən ~ pú:q̓ʷostən]	*face powder*
c.	q̓ʷəl-q̓ʷalas	[q̓ʷə́lq̓ʷalʌs]	*raccoons*
	ǰiq̓ʷam	[ǰɛ́q̓ʷam ~ ǰɛ́:q̓ʷam]	*sweat*
	k̓ʷəɬ-k̓ʷaɬt	[k̓ʷə́ɬk̓ʷaɬtʰ]	*dishes, all the plates*
d.	tuq̓ʷəm	[tóq̓ʷəm]	*have a cold*
	x̌ʷat̓q̓ʷəm	[x̌ʷát̓q̓ʷɔm]	*thunder* (cf. puffball)

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[1]This needs more work - the vowel makes this look like k̓ʷit- however, there is also a stem q̓ʷit=šn which means *go down towards the water* - this.

(72) medial position: before a consonant (syllable final)

a. ǰiq̓ʷnit / ǰaq̓ʷnit		[ǰɛ́q̓ʷnɛt]	*ask for work*
q̓ʷi-q̓ʷiƛ̓=šin=uɬ	ƛ/k̓ʷ	[q̓ʷíq̓ʷᵊƛ̓ši·nòɬ]	*small starfish* (dim.)
b. t̓ᶿuq̓ʷ-t̓ᶿuq̓ʷ-uq̓ʷ		[t̓ᶿóq̓ʷt̓ᶿoq̓ʷɔq̓ʷ]	*lots of feathers*
c. məq̓ʷ-mq̓ʷt̓ᶿ		[mʊ́q̓ʷmaq̓ʷt̓ᶿ ~ mɔ́q̓ʷ-]	*lots of onions*
d. gə̣q̓ʷ-t		[gʊq̓ʷt]	*to drag s.t.*
q̓ʷə-q̓ʷx̌-t čən		[q̓ʷɔ́q̓ʷx̌tᵊ čɩn]	*I'm filleting it* (the fish)
məq̓ʷ-t		[mɔ́q̓ʷt]	*swallow it*

(73) word-final position

a. ---iq̓ʷ		----	----
b. ɬuq̓ʷ		[ɬoq̓ʷ]	*clear skies*
suq̓ʷ / swq̓ʷ		[suq̓ʷ]	*crazy*
ɬuq̓ʷ-ɬuq̓ʷ		[ɬóq̓ʷɬoq̓ʷ]	*oysters*
t̓ᶿu-t̓ᶿuq̓ʷ		[t̓ᶿó:t̓ᶿòq̓ʷ ~ t̓ᶿó·t̓ᶿòq̓ʷ]	*feather*
c. ---aq̓ʷ		----	----
d. ɬəq̓ʷ	q̓ʷ/k̓ʷ	[ɬəq̓ʷ ~ ɬʊq̓ʷ]	*arrow*

ʔ

(74) word-initial position

a. ʔiɬtan	[ʔɛ́ɬtən ~ ʔɛ́ɬtʌn]	*eat, food*
ʔimin	[ʔɛ́mɩn]	*door*
b. ʔusa	[ʔósa]	*blueberry*
ʔuɬqay	[ʔóɬqʌy]	*snake*
c. ʔaq̓-ət	[ʔáq̓ʌt]	*chase it*
ʔasxʷ	[ʔásxʷ ~ ʔásw̥]	*seal*
ʔay=ičin	[ʔáyyɩčɩn]	*back* (body)

d.	ʔəs-ʔasxʷ	[ʔə́sʔasxʷ]	*seals*
	ʔəw-ʔawukʷ	[ʔə́wʔəwəkʷ ~ ʔú·ʔəwəkʷ]	*tobacco* (pl.)

(75) medial position: between vowels (syllable initial)

a.	tiʔi	[tέʔε]	*this one here*
	s[iʔ]i-səp-saplin	[sέʔεsəpsàpᵊlεn]	*lots of little bits of bread*
	niʔ-it	[né:ʔεt]	*be in the way*
b.	xʷuʔus	[xʷúʔɔs]	*porcupine*
	muʔus	[móʔos]	*head*
	šuʔ-ət	[šóʔot ~ šóʔɔt]	*choose it*
	tuʔup̓ / tuʔup / tup	[tóʔop̓ ~ tóʔopʰ ~ tópʰ]	*stove*
c.	x̌aʔay	[x̌áʔay]	*bog cranberry*
	ʔay-ʔəǰ̓=uθ-əm / ʔəǰ̓- *good*	[ʔáyʔaǰùθəm]	*language of our people*
	nam-ʔamin /nam-ʔm=min/	[námʔamεn]	*pen, pencil, s.t. write with*
d.	ƛ̓iʔəm	[ƛ̓í·ʔəm]	*cockle*
	č̓əʔ=umixʷ=tən	[č̓óʔomὲxʷtən]	*floor rug, carpet*
	x̌əʔa	[x̌áʔa]	*butter clam*

(76) medial position: before a consonant (syllable final)

a.	θəy̓θa / θiʔθa	[θέʔθa]	*that one* (fem.)
	θiʔqʷ=šin (tᶿik̓ʷ=šin??)	[θέʔqʷš̃in]	*left foot*
b.	č̓uʔ-č̓uʔ	[č̓ɔ́ʔč̓ɔʔ]	*wren*
c.	θaʔpač	[θáʔpʌč]	*antlers*
	ʔa-ʔasxʷ+[i]=uɬ	[ʔáʔseᵊxʷùɬ]	*seal pup* (dim.)
	x̌ʷaʔx̌ʷit	[x̌ʷáʔx̌ʷεt]	*egg, eggs*
d.	məʔ-muʔus	[má:mòʔos] a:	*heads* (pl)
	məʔ-t	[mʌ́ʔtʰ]	*get s.t.*
	məʔ-xʷ-an kʷu	[mʌ́ʔᵊxʷʌn kʷu]	*I've got it now* (NTr.)

ƛ̓əʔɬum̓	[ƛ̓ɑ́ʔᵊɬom̓]	*wolf*
ƛ̓i-ƛ̓əʔɬum=uɬ	[ƛ̓ɩ́ƛ̓ɑʔɬòmʊɬ]	*young wolf, wolf cub*

(77) word-final position

a.	qi-qti+ʔ	[qɛ́qtɛʔ]	*youngest in family*
	kʷəy̓	[kʷiʔ]	*tomorrow*
b.	θu ǰuʔ / hu ǰuʔ	[θɔ́ ǰúʔ] ~ [hó ǰúʔ]	*to go home*
	ʔamamuʔ	[ʔɑ́mamɔ̀ʔ]	*chiton*
	č̓a-č̓nu+ʔ	[č̓ɛ́č̓nɔʔ]	*small dog, puppy*
	qʷuʔ	[qʷɔ́ʔ ~ qʷóʔ]	*get water, fetch water*
c.	kʷumaʔ	[kʷúmaʔ]	*ratfish*
	ʔayaʔ	[ʔáyɛʔ]	*house*
	mi-mnaʔ (cf. mən̓a)	[mɛ́mnaʔ]	*small child, baby*
	kʷu-kʷpa+ʔ	[kʷúkʷpaʔ]	*grandfather* (Dim.)
	xʷaʔ	[xʷáʔ]	*no* (Neg)
d.	šəʔ	[šɛ́ʔ]	*climb, go up*
	č̓əʔ=nač=tn	[č̓ɛ́ʔnʌčtɩn]	*small blanket to sit on*
	č̓əʔ=umixʷ=tn	[č̓óʔomɛ̀xʷtən]	*rug on floor*
	č̓əʔ-	č̓ɛʔ-	*be on top of*

IV.2 Obstruents: Fricatives

The fricatives in Sliammon are presented in the following order: θ, s, ł, š, x^{w}, x̌, x̌^{w}, h. Examples of which are given in the next section.

θ

(78) word-initial position

a.	θič-im̓ ~ θič-im	[θíčɩm̓ ~ θíčɩm]	*up in the back woods*
	θiq-ʔəm	[θɛ́qʔʌm] q̓ /q-ʔ/	*dig (s.t.)*
	θiq=nač	[θɛ́qnʌč^{h}]	*dig roots*
	θi-θy̓ał	[θíθ^{ə}yɛ̀ł]	*small lake*
	θiy=umix^{w}=tən	[θéyomɩ̀x^{w}tən ~ mɩ̀x^{w}]	*floor*
b.	θumin	[θómɩn]	*eyebrow*
c.	θapax̌=us	[θápax̌os]	*male deer; horns on head*
	θatix̌im	[θátɛx̌ɛm]	*small waterfall*
d.	θəč̓	[θɩč̓]	*straight*
	θəy̓ał	[θáʔ^{ə}yɛł]	*lake*

(79) medial position: between vowels (syllable initial)

a.	θuθin	[θóθɛn]	*mouth*
	q^{w}up=uθin	[q^{w}ó:pòθɛn]	*beard*
	θiw=uθin=tən	[θéwʊθètən ~ θɛ́wʊθɛ̀tən]	*table*
	k^{w}ix^{w}=uθi(n)=tən	[k^{w}íx^{w}uθɛ̀tən]	*lipstick*
b.	k̓^{w}ən-[i]θut	[k̓^{w}ʊ́ne·θot^{h}]	*watch out, be careful*
	təš-θut	[tʌ́šθɔt]	*to get close*
c.	θa-θapiš č	[θáθapišč]	*I'm bathing now*
	θa-θat^{θ}im=uł	[θáθat^{θ}e·mʊ̀ł ~ ɛ·]	*small Spring salmon*
d.	θəy̓-θəy̓ał	[θí:θaʔ^{ə}yɛł]	*lakes* (pl)

(80) medial position: before a consonant (syllable final)

a.	qʷup=iθx̌an	[qʷópeθx̌ʌn ~ qʷó:pèθx̌ʌn]	*hair under arms*
b.	ʔaʔǰuθmit /ʔə-ʔǰ̓=uθ-m-it/	[ʔáʔǰoθmet]	*to understand*
	ƛ̓uθ-ʔəm	[ƛ̓ɔ́θʔəm]	*hew, work with stone*
c.	aθC	----	----
d.	θə́-θt̓ᶿəm	[θə́θt̓ᶿəm ~ θɪ́θt̓ᶿəm]	*jigging*
	ɬəθ=tən	[ɬə́θtən ~ ɬʌ́θtən]	*perfume*
	p̓əθk	[p̓ʌθk]	*bullhead*

(81) word-final position

a.	k̓il[i]θ	[k̓éleθ]	*crooked*
b.	niʔ=ay̓u=uθ ???	[níʔaʔǰuθ] ~ [ní:]	*bait a line, bait a trap*
c.	qigaθ	[qégʌθ]	*deer*
	məǰaθ / məǰiθ	[mʌ́ǰɛθ]	*meat*
d.	p̓əθ	[p̓ʌθ]	*black*
e.	məθkʷ	[məθkʷ]	*blackcap berry*
	walθ	[walθ]	*bullfrog*
	qawθ	[qáwθ]	*potato, potatoes*

s

(82) word-initial position

a.	sin=kʷu	[sɛ́nkʷo ~ sénkʷu]	*ocean*
b.	suʔkʷ-[i]m	[súʔkʷɛm]	*shake*
	sup-ət	[sópʊt]	*chop it*
c.	saɬtxʷ	[sáɬtxʷ ~ sáɬtw̥]	*woman*
d.	səq̓-t	[sʌq̓t]	*peel it off* (wild cherry bark)
	səq̓	[səq̓ ~ sʌq̓]	*half, half dollar, half-breed*
e.	sq̓ʷəǰ-[i]m	[sq̓ʷʌ́ǰɪm]	*poor*
	sk̓ʷiči	[sk̓ʷíči]	*bothersome, a pest*

	snəq	[snʌ́q]	*dear*

(83) medial position: between vowels (syllable initial)

a.	si-siθitᶿəm	[sísiθètᶿəm ~ sísiθɛ̀tᶿəm]	*I'll give you advice*
b.	č̓usug-ət	[č̓ósogʌt]	*wrongly accuse, insult s.o.*
c.	səy̓-say̓	[sí:say̓]	*scared*
	ʔusa	[ʔósa]	*blueberry*
d.	vsə	----	----
e.	k̓ʷaʔsta	[k̓ʷáʔsta]	*cup*

(84) medial position: before a consonant (syllable final)

a.	si-sk̓ʷim̓	[sɛ́sk̓ʷɩm̓ ~ sésk̓ʷɩm̓]	*shaking*
b.	muʔus-s kʷ ǰanxʷ	[móʔos: kʷᵊ ǰɛ́nxʷ]	*fish's head; head of fish*
c.	sasxʷin ~ saʔsxʷin	[sásxʷɩn] ~ [sáʔᵊsxʷɩn]	*two the same, a pair*
d.	q̓əs=ƛ̓ač	[q̓ʌ́sƛ̓æč]	*laughed so hard*

(85) word-final position

a.	t̓i-t̓əs-t̓is	[t̓ét̓ə́st̓és]	*any bird*
b.	t̓ᶿit̓ᶿ=awus	[t̓ᶿɛ́t̓ᶿwus ~ t̓ᶿɛ́t̓ᶿᵊwus]	*peeping, spying*
	t̓əq̓ʷ=us	[t̓áʔq̓ʷɔs]	*rock cod*
c.	ƛ̓as	[ƛ̓as]	*glass* (< English glass)
	k̓ʷas	[k̓ʷás]	*hot*
d.	q̓əs-q̓əs	[q̓ʌ́sq̓ʌs ~ q̓ə́sq̓əs]	*tired of sitting*
	pəs	[pə́s]	*numb, get numb*

(86) word-initial position

a.	ɬixʷč	[ɬíxʷč]	*I lost a loved one*
	ɬik̓ʷ-ʔəm	[ɬík̓ʷəm ~ ɬík̓ʷʊm]	*to sew (s.t.)*
	ɬik̓ʷ=ay̓=it̓ᶿa=tən	[ɬéyk̓ʷaʔy̓it̓ᶿatʌn]	*sewing machine*
b.	ɬup=us	[ɬó:pos]	*half bald*
	ɬuq̓ʷ-u-θut stress	[ɬóq̓ʷoθotʰ ~ ɬóq̓ʷoθʊtʰ]	*to clear up* (weather)
c.	ɬaʔamin	[ɬáʔamɩn]	*Sliammon*
d.	ɬəx̌	[ɬʌx̌]	*bad*
	ɬəθ=tən	[ɬə́θtən ~ ɬʌ́θtən]	*perfume*
	ɬəqʷ=an̓a=tən	[ɬə́qʷʔanat̓ɩn]	*earring*

(87) medial position: between vowels (syllable initial)

a.	vɬi	----	----
b.	qʷuɬ-um	[qʷɔ́ɬɔm]	*to wade*
c.	t̓uɬaɬ	[t̓óɬaɬ]	*bed*
	qʷəɬ=ay̓	[qʷə́ɬʌy̓ ~ qʷʊ́ɬay̓]	*driftwood*
d.	ƛ̓aɬəm	[ƛ̓áɬəm]	*salt*

(88) medial position: after a consonant and before a vowel (syllable initial)

a.	təkʷɬi	[tʊ́kʷɬe]	*rabbit*
b.	Cɬu	----	----
c.	ɬən-ɬan̓ukʷ / ɬan̓əkʷ	[ɬə́nɬaʔnʊkʷ~ ɬɩ́nɬaʔnʊkʷ]	*animal hides*
d.	ɬəqʷ-ɬəqʷ=an̓a=tən	[ɬʌ́qʷɬʌqʷʔanatɩn]	*earrings* (pl.)

(89) medial position: before a consonant (syllable final)

a.	ɬi-ɬx̌=umiš	[ɬɛ́ɬx̌omɩš]	*little bit ugly*
b.	t̓uɬ-amin /t̓uɬ-ʔm=min/	[t̓óɬʌmɛn]	*counter top*
c.	ɬa-ɬn̓[i]kʷ	[ɬáɬnɛkʷ]	*small hide*

	k̓ʷaɬt	[k̓ʷaɬt]	*plate*
d.	ɬə-ɬqiš	[ɬʌ́ɬqɛš]	*going across*
	səɬ-saɬtxʷ	[sɩ́ɬsaɬtxʷ ~ sɩ́ɬsaɬtw̥]	*women* (as in *young women*)

(90) word-final position

a.	qʷəw̓iɬ	[qʷáʔwɩɬ ~ qʷáʔwɛɬ]	*pitch, chewing gum*
	t̓ᶿamqʷ[i]L	[t̓ᶿámqʷiɬ]	*clouded over, overcast*
b.	ƛ̓i-ƛ̓p=ig[i]s=uɬ	[ƛ̓ɛ́ƛ̓pegɩs:oɬ]	*bikini underwear*
c.	pus=ɬaɬ	[púsɬaɬ]	*Adam's apple*
	tixʷθaɬ	[tɩ́xʷθəɬ]	*tongue*
	θəy̓aɬ	[θáʔᵊyɛɬ]	*lake*
d.	təxʷ-tixʷθaɬ	[tʊ́xʷtixʷθʌɬ]	*tongues* (pl)
	məx̌awuɬ	[mʌ́x̌ʌwəɬ ~ mʌ́x̌ʌwʊɬ]	*half moon*
e.	t̓ᶿamqʷL	[t̓ᶿámqʷɬ]	*cloud*

š

(91) word-initial position

a.	šəʔ=igs	[šɛ́ʔɛws]	*high=body* gloss
	šimən / šəmən	[šɩ́mʌn]	*enemy*
b.	šuʔ-ət	[šʊ́ʔɔt]	*choose it*
c.	šas-ət	[šɛ́sʌt]	*sneak up to it*
	šawɬ	[šɛ́wɬ ~ šʌ́wɬ]	*door, path, trail*
d.	šəm̓	[šɩm̓]	*dry*
	šəm̓=ay=it̓ᶿa=tən	[šɛ́ʔᵊmayit̓ᶿatən]	*clothes dryer*
	šəms	[šɩms]	*it's ours*
	šəq-θut	[šʌ́qθot]	*sigh*

(92) medial position: between vowels (syllable initial)

a.	čišičx^w / čišit čx^w tr.?	[číšičx^w]	*to challenge* (to a race)
	ɬəqiš=ayin	[ɬʌ́qɛšéyɩn]	*bridge*
b.	t̓išus-əm	[t̓éšosəm]	*Sliammon* (place name)
c.	ša-šat=ap=šən	[šɛ́šɛtàpʰšɩn]	*high heels*
d.	t̓iš=iq^w	[t̓ɩ́šəq^w ~ t̓ɩ́šʌq^w]	*snot, nasal mucus*

(93) medial position: before a consonant (syllable final)

a.	k^wíš-k^wiš	[k^wɩ́šk^wiš ~ k^wɩ́šk^wɩš]	*Steller's jay*
b.	muš-muš	[mʊ́šmuš]	*cow*
c.	ašC	----	----
d.	q^wəšʔim	[q^wʌ́šʔem]	*dolphin*

(94) word-final position

a.	tumiš	[túmɩš ~ tú·mɩš]	*man*
	čayiš	[čéyɩš ~ čéⁱyɩš]	*arm, hand*
b.	muš-muš	[mʊ́šmuš]	*cow*
c.	tam-aš	[tʌ́maš ~ tʌ́mʌš]	*to desire s.t.*
d.	pan-aš	[pʌ́nʌš]	*to bury* (tr.?)
	nam̓-aš	[náʔmʌš]	*to get rid of s.t.*
e.	t̓ayš	[t̓ayš ~ t̓áyˡš]	*blanket*
	ɬaw-š	[ɬʌ́wš]	*leave it*

(95) [x^y] as allophone of /š/

a.	x^wəl̓uwla=xən	[x^wáʔlowlàx^yɩn]	*spiked heels, high heels*
a'.	xəluwla=šən	[x^yɩlowlášɩn]	*spiked heels*
a".	ša-šat=ap=šən	[šɛ́šɛtàpʰšɩn]	*high heels*
b.	ʔimaš	[ʔɛ́mʌš]	*walk*

b'.	ʔimax=ij̓a / ʔimax=ij̆a[2]	[ʔɛ́maxʸiʔj̆ɛ ~ ʔɛ́maxʸij̆a]	*ant* (lit: *fast walker*)

xʷ

(96) word-initial position

a.	xʷit̓ᶿ=tən	[xʷít̓ᶿtən]	*swing for a baby*
	xʷip=umixʷ	[xʷípomɩxʷ]	*to sweep the floor*
	xʷip=umixʷ=tən	[xʷípomɩ̀xʷtən]	*a broom*
b.	xʷukʷt	[xʷúkʷt]	*nothing*
c.	xʷaʔ	[xʷaʔ]	*no*
d.	xʷət (x̌ʷət ?)	[xʷʊt]	*Swainson's thrush*

(97) medial position: between vowels (syllable initial)

a.	nəxʷiɬ /nxʷiL/	[nʊ́xʷ:ɩɬ ~ núxʷɩɬ ~ nʊ́xʷɛɬ]	*dugout canoe, canoe*
b.	xʷu-xʷuj̆əm	[xʷúxʷuj̆ɩm] stress	*sales person*
c.	xʷa-xʷaʔ	[xʷáxʷaʔ]	*not yet*
	čətuxʷan	[čítuxʷʌn ~ čɩ́tuxʷʌn]	*blackberry*
d.	Vxʷə	----	----

(98) medial position: before a consonant (syllable final)

a.	tixʷθaɬ	[tíxʷθaɬ]	*tongue*
b.	t̓uxʷʔəm	[t̓úxʷʔəm]	*huckleberry*
c.	axʷC	----	----
d.	ƛ̓əxʷ-t	[ƛ̓ʊxʷt]	*to beat s.o. in a contest*
	nəxʷ-nəxʷiɬ /CəCPL-nxʷiL/	[nʊ́xʷnʊxʷɛɬ]	*dugout canoes*

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[2]The suffix =ij̓a/=ij̆a may be a [-back] variant of the LS=uj̓a *hand, arm* judging from the literal meaning of the word and the relationship to the Root ʔimaš/ʔimax *walk*.

(99) word-final position

a.	qaymixʷ	[qáymɩxʷ]	*person, native person*
	ɬixʷ	[ɬíxʷ]	*lose a loved one*
b.	uxʷ	----	----
c.	ʔaxʷ	[ʔaxʷ]	*falling snow*
	ʔa-ʔaxʷ	[ʔáʔaxʷ]	*it's snowing*
	ti-th=unaxʷ	[títhònʌxʷ]	*big waves*
d.	t̓uʔnəxʷ	[t̓óʔənəxʷ ~ t̓óʔᵊnʊxʷ]	*cattails, bulrushes*
	təgixʷ	[tɩ́gʸʊxʷ ~ tɩ́gʸixʷ]	*nine*

x̌

(100) word-initial position

a.	x̌-iʔ-i-x̌niq̓ / x̌[iʔ]i-x̌niq̓	[x̌ɛ́ʔɛx̌ᵊnɛq̓]	*Owl's Grove* (place name)
b.	x̌u---	----	----
c.	x̌at̓ᶿ=inas	[x̌á:t̓ᶿenʌs ~ x̌á·t̓ᶿenʌs]	*breast bone, sternum*
	x̌aƛ̓a kʷ kiks	[x̌áƛ̓ʌ kʷ kíks]	*do you want a cookie?*
	x̌aƛ̓ a kʷəθ ʔiɬtan	[x̌áƛ̓a kʷəθ ʔɛ́ɬtʌn]	*do you want to eat?*
	x̌ákʷu	[x̌ákʷu]	*cow parsnip, Indian rhubarb*
	x̌awgas	[x̌áwgʌs ~ x̌ʌ́wgʌs]	*grizzly bear*
	x̌aw̓s	[x̌aw̓s]	*new*
d.	x̌əpi	[x̌ʌ́pi]	*to turn back*
	x̌ət̓k̓ʷ-əʔəm / : -k̓ʷaʔʌm	[x̌ʌ́t̓k̓ʷʊʔəm]	*carve, put a design on s.t.*
	x̌əʔa	[x̌áʔa]	*butter clam*

(101) medial position: between vowels (syllable initial)

a.	θatix̌im	[θátɛx̌ɛm]	*small waterfall*
b.	t̓ᶿəx̌u	[t̓ᶿóx̌ʷo ~ t̓ᶿɔ́x̌ʷ:o]	*ling cod*
b'.	DIM-CəCPL-t̓ᶿx̌u+[ʔ]	[t̓ᶿɩ́t̓ᶿʌx̌t̓ᶿəx̌ʷoʔᵒ]	*lots of small cod*

c.	mix̌aɬ	[mέx̌ʌɬ]	*black bear*
	yax̌ay	[yáx̌ʌy ~ yʌ́x̌ʌy]	*clam basket*
	qʷup=iθx̌an	[qʷó·peθx̌ʌn]	*hair under arm*
	məx̌=awuɬ	[mʌ́x̌ʌwəɬ ~ mʌ́x̌ʌwʊɬ]	*half moon*
d.	səx̌əm	[sə́x̌əm ~ sʌ́x̌ʌm]	*racing canoe*

(102) medial position: after a consonant and before a vowel (syllable initial)

a.	...Cx̌i -	----	----
b.	--Cx̌u--	----	----
c.	mə-m̓x̌-ay̓=šən	[máʔmx̌áy̓šɩn ~ šin]	*wolverine*
	č̓a-č̓x̌-[a]ʔamin	[č̓έč̓x̌aʔᵊmɛn]	*microwave oven*
d.	-Cx̌ə-	----	----

(103) medial position: before a consonant (syllable final)

a.	x̌i-x̌yaq̓ ?	[x̌έx̌yɛq̓]	*crab*
	x̌i-x̌č̓-[a]ʔmin	[x̌έx̌č̓ɛ̀ʔmen]	*fork*
b.	ux̌C	----	----
c.	x̌ax̌giɬ	[x̌áx̌giɬ]	*Indian doctor*
	yax̌t	[yʌx̌t]	*rib*
d.	wəx̌-wəx̌	[wʌ́x̌ᵊwʌ̀x̌]	*cigarette*
	x̌əkʷ-x̌akʷu	[x̌ʌ́kʷx̌ákʷu]	*lots of cows parsnip*

(104) word-final position

a.	ƛ̓a-ƛ̓at[i]x̌	[ƛ̓áƛ̓atɛx̌]	*grasshopper*
b.	--ux̌	----	----
c.	qayax̌	[qáyax̌]	*digging stick, root digger*
	ƛ̓ax̌-ax̌	[ƛ̓áx̌ʌx̌]	*getting old*
d.	qəx̌	[qəx̌]	*many*

	wəx̌-wəx̌	[wʌ́x̌^{ə}wʌ̀x̌]	*cigarette*
e.	qayx̌	[qáyx̌]	*Mink* (stage name)

x̌^{w}

(105) word-initial position

a.	x̌^{w}iƛ̓=ay	[x̌^{w}ɛ́ƛ̓ay]	*mountain goat*
b.	x̌^{w}us-əm	[x̌^{w}ósɔm]	*Indian ice cream*
c.	x̌^{w}a-x̌^{w}an̓i	[x̌^{w}áx̌^{wə}nɛʔ]	*tidepool sculpin, bullhead*
	x̌^{w}aw̓it / x̌^{w}əw̓it	[x̌^{w}áʔ^{a}wɩt] stress	*fire*
d.	x̌^{w}əp̓=ayin	[x̌^{w}áʔp̓ayɩn]	*Labrador tea*
	x̌^{w}əs	[x̌^{w}ʌs]	*oil*
	x̌^{w}əs=aya	[x̌^{w}ʌ́shàyɛ ~ x̌^{w}ʌ́s:àyɛ]	*oil container*

(106) medial position: between vowels (syllable initial)

a.	x̌^{w}iʔi-x̌^{w}iy	[x̌^{w}ɛ́ʔɛx̌^{w}ey]	*elastic*
b.	x̌^{w}u-x̌^{w}up̓=ay̓i(n) č	[x̌^{w}óx̌^{w}op̓ɛ̀ʔɩč]	*making a basket*
c.	x̌^{w}a-x̌^{w}ay-əm̓	[x̌^{w}áx̌^{w}ayɩ̀mʔ]	*housefly* (cf. x̌^{w}ay-əm *dive*)
	sux̌^{w}a	[sóx̌^{w}a]	*urine; to urinate*
	t̓^{θ}ux̌^{w}-am-ʔamin	[t̓^{θ}óx̌^{w}amʔʌ̀mɩn]	*dish pan*
	ƛ̓əx̌^{w}=ay	[ƛ̓ɔ́x̌^{w}ʌy]	*chum salmon, dog salmon*
d.	ǰux̌^{w}-ət	[ǰóx̌^{w}ʌt]	*to vomit* (tr.? vowel)

(107) medial position: before a consonant (syllable final)

a.	x̌^{w}ix̌^{w}ʔ=igan-əm	[x̌^{w}ɛ́x̌^{w}ʔɛgánəm]	*to doubt s.b.*
b.	x̌^{w}uʔx̌^{w}p̓	[x̌^{w}óʔx̌^{w}p̓]	*awl*
	sux̌^{w}a=aw̓tx^{w}	[sóx̌^{w}ʔàw̓tx^{w} ~ sóx̌^{w}ʔàwtx^{w}]	*bathroom* (cf. sux̌^{w}a)
c.	x̌^{w}a-x̌^{w}n̓i	[x̌áx̌^{ə}nɛʔ]	*bullhead, tidepool sculpin*
	təx̌^{w}-n[i]x^{w}-an	[tɔ́x̌^{w}ne·x^{w}ʌn]	*I know*

d.	ƛəx̌ʷt	[ƛʊx̌ʷt]	*to spit*

(108) word-final position

a.	p̓ix̌ʷ	[p̓ɛx̌ʷ]	*flood*
b.	q̓əp̓ux̌ʷ	[q̓ʌ́p̓əx̌ʷ]	*nut*
c.	ǰax̌ʷ	[ǰɛx̌ʷ]	*to melt* (e.g. ice)
	ǰax̌ʷ-ət	[ǰáx̌ʷʌt] a ~ ɛ?	*to thaw s.t.*
d.	git̓əx̌ʷ	[gít̓əx̌ʷ]	*Mary Point* K&B(1983 #47)

h

(109) word-initial position

a.	hiw=čis	[hɛ́wčɩs]	*paddle*
	hig̓an	[hɛ́ʔgʌn]	*strawberry*
	hiy=nač	[híynʌč ~ héynʌč]	*bottom of basket*
b.	hu č	[hoč]	*I'm going*
	hum̓-hum	[hóm̓hom]	*blue grouse*
c.	ham̓u	[háʔmo ~ háʔᵃmo]	*pigeon*
	hanaqʷus	[hánaqʷos]	*wolf eel; aggressive*
d.	haw-ʔamin /haw-ʔm=min/	[hʌ́wʔʌmɛn]	*kettle*
	həw-higus	[hʌ́whegʊs]	*chiefs*

(110) medial position: between vowels (syllable initial)

a.	hi:hiʔ / həy̓həy̓	[hɛ́ʸ:heʸʔ ~ héi:heiʔ]	*arrow*
b.	p̓uhu=qin	[p̓óhoqɛn]	*raven's call*
	č̓əɬ=ukʷt=nač	[č̓ɛ́ɬ[h]òkʷtᵊnàč]	*rain pants*
c.	ha-has-əm č	[háhasəmč]	*I'm sneezing*
	kapi=aya	[kápihàyɛ]	*coffee pot*
d.	hi-həw=čis-ma	[hɛ́hʌwčɩsma]	*get there by paddling*

(111) medial position: syllable initial

a.	həy-hiyum̓	[híy^{ə}heyomʔ]	*seagulls* (pl)
b.	ʔinhus	[ʔέnhos]	*new moon, new month*
	č̓əɬ=uk^{w}t	[č̓íɬhòk^{w}t^{h} ~ č̓ɩɬ.ɬòk^{w}t^{h}]	*rain coat*
	ti-th=unax^{w}	[títhònʌx^{w}]	*big waves*
c.	tih=aya	[tíhayε]	*teapot, cup of tea*
	ti-th=aya+ʔ / ti-th=aya-[i]+ʔ	[tɩ́thàyiʔ]	*small teapot*
d.	xhə	----	----

(112) medial position: before a consonant (syllable final)

a.	...ihC	----	----
b.	puh-ʔəm	[púhʔʌm ~ pú:ʔʌm]	*windy, to blow* (wind)
c.	č̓ah-č̓ah-əm	[č̓έhč̓έhʌm]	*to greet, to thank*
	x̌^{w}ah-ʔəm	[x̌^{w}áhʔʌm]	*to send s.o.*
d.	qəh-t	[qʌht]	*hoist it up, lift it up*

(113) word-final position

a.	tih	[tih ~ ti:]	*big*
b.	uh	----	----
c.	ʔah	[ʔah ~ ʔa^{h}]	*sore, pain*
d.	qəh-t	[qʌht]	*hoist it up, lift it up*

IV.3 Sonorant Obstruents

ǰ, ǰ̓, g, g̓

ǰ which is realized as [ǰ ~ y ~ i ~ e ~ č]

(114) word-initial position

a.	ǰičayš / ǰəčayš	[ǰɩ́čeyš]	*spear for cod & cod eggs*
b.	ǰuk̓ʷ-ət	[ǰúk̓ʷʊt]	*smash it up*
	ǰuw̓akʷ	[ǰúʔᵊwʌkʷ]	*a wave* (of water)
c.	ǰaǰ̓a	[ǰɛ́ʔǰɛ]	*tree*
	ǰanxʷ	[ǰɛ́nxʷ ~ ǰɛ́nw̥]	*fish, any fish*
d.	ǰətkʷ	[ǰə́tkʷ]	*shake*
	ǰəƛ̓	[ǰɩƛ̓]	*run*
	ǰəƛ̓-ǰəƛ̓=umixʷ	[ǰɛ́ƛ̓jaʔƛ̓òmɩxʷ]	*car (runs on ground)*
	ǰək̓ʷ=iqʷ=uǰ̓a=tən	[ǰɛ̀ʔk̓ʷeqʷóʔǰɛtən]	*nail polish*
	ǰəɬ-ʔəm-θ-as	[ǰɩ́ɬʔʌmθʌs]	*s/he paid for me*
	ǰəqiš	[ǰʌ́qɛš ~ ǰɛ́qɛš]	*crawl*

(115) medial position: between vowels (syllable initial)

a.	ƛ̓ip=aǰitiq	[ƛ̓ɛ́paǰɩtɛ̀q]	*chin*
	tᶿaǰ-it ga	[tᶿáǰitᵊgà]	*put it in the shade!*
	qʷaǰ-[i]m	[qʷáǰɛm ~ qʷáǰem]	*moss*
	qəǰi	[qʌ́ǰi]	*still*
b.	vǰu	----	----
c.	ʔimax-iǰa	[ʔɛ́maxʸiǰa]	*ant* (cf. ʔimaš *walk*)
	tᶿaǰ=awus=tən	[tᶿàǰɛwústən]	*sun glasses, shade eyes*
	miǰaθ	[méǰʌθ ~ mɛ́ǰʌθ ~ mʌ́ǰʌθ]	*meat*
	gəǰa / giǰa	[gɩ́ǰɛ]	*earth, ground, dirt*
d.	tat=nač=ap	[tátn̩aǰɨpʰ]	*whole leg, hip*

e. ǰən-ǰənis	[ǰə́nǰənɛs ~ ǰɩ́nǰɩnɛs]	*teeth*

(116) medial position: before a consonant (syllable final)

a. iǰC	----	----
b. uǰC	----	----
c. t̓$^{\theta}$aǰ=tən	[t̓$^{\theta}$áytən]	*sun umbrella* (cf. shade)
d. čəǰ-čuǰ̓	[čɩ́:čʊẏ]	*children*
ǰə-ǰƛ̓	[ǰəyƛ̓ ~ ǰɩ́·ƛ̓]	*running* (IMP)
həǰ=mix^{w}	[hʌ́ymɩx^{w}]	*build a house*

(117) medial position : between consonants: vocalization

a. ǰə-ǰƛ̓+[ʔ] ǰə-ǰƛ̓	[ǰɩ́:ƛ̓]	*running (cf.* ǰəƛ̓ *run*)
b. ǰə-ǰqiš+[ʔ]	[ǰɩ́:qɛš]	*crawling* (cf. ǰəqiš *crawl*)

(118) word-final position

a. iǰ	----	----
b. huǰ	[hóy]	*stop*
c. aǰ	----	----
d. həǰ	[həy]	*build*
hə-hǰ=igiL+[ʔ]	[háh^{ə}ǰɩgɩɬ]	*building a boat*

ǰ̓

(119) word-initial position - systematic gap : *R'/word-initially

(120) medial position: between vowels (syllable initial)

a. q̓əsnaǰ̓-i(t) č	[q̓ʌ́s^{ə}naʔǰič^{h}]	*I've got my dress on*
x̌əǰ̓is	[x̌áʔǰis]	*rock*
x̌əǰ̓-x̌əǰ̓is	[x̌é·x̌aʔǰis]	*rocks* (pl)

	q̓ʷa-q̓ʷǰ̓[i]x̌	[q̓ʷáq̓ʷaǰɛx̌]	*little bit of wood*
b.	ʔəǰ̓=umiš	[ʔáʔǰumɩš]	*bright coloured, beautiful*
	kʷakʷ=aǰ̓u	[kʷákʷáʔǰu]	*squirrel*
	tᶿum=aǰ̓u	[tᶿómaʔǰʊ]	*barnacle*
	xʷəƛ=aǰ̓u	[xʷʊ́ƛaʔǰu]	*trout*
	xʷəǰ̓u	[xʷáʔǰu]	*bait*
c.	x̌ʷus-um=aǰ̓a	[x̌ʷósɔmàʔǰɛ ~ so]	*soapberry leaves*
	ʔup=aǰ̓a=čis	[ʔópaʔǰɛ̀čis]	*mittens* (ten fingers)
	ƛ̓ax̌=iqʷ=uǰ̓a	[ƛ̓áx̌ɛqʷòʔǰɛ]	*thumb*
	wač=uǰ̓a	[wáčuʔǰɛ]	*wrist watch*
	wač=uǰ̓a=tən	[wáčuʔǰatʌn]	*wrist watch*
	ʔimax-iǰ̓a	[ʔɛ́maxʸìʔǰɛ]	*ant* (cf. ʔimaš *walk*)
	ʔəǰ̓=aq-əm	[ʔá:ǰɛqʌm]	*rainbow*
d.	q̓əsnaǰ̓-əm	[q̓ʌ́snaʔǰɩm]	*to get dressed*

(121) medial position: after a consonant

a.	Cǰ̓i	----	----
a.	ču-čǰ̓=uɬ	[čúčᵊǰʊɬ]	*small child*
a.	Cǰ̓a	----	----
a.	Cǰ̓ə	----	----

(122) medial position: before a consonant (syllable final)

a.	iǰ̓C	----	----
b.	uǰ̓C	----	----
c.	q̓ʷaǰ̓x̌	[q̓ʷʌ́y̓x̌ ~ q̓ʷéy̓x̌]	*wood, firewood*
d.	x̌əǰ̓-x̌əǰ̓is	[x̌é·x̌aʔǰis]	*rocks* (pl)
	čəy̓-čuy̓ /čəǰ̓-čuǰ̓/	[čí:čʊy̓]	*children*

(123) word-final position

a.	iǰ̓	----	----
b.	čuǰ̓	[čuy̓]	*child*
	čəǰ̓čuǰ̓	[čí:čuy̓ ~ čí:čʊy̓]	*children*
c.	q̓əsnaǰ̓	[q̓ʌ́s^{ə}nay̓]	*shirt, dress*
d.	ʔəǰ̓-əǰ̓	[ʔáʔǰəy]	*get better*
	ʔə-ʔǰ̓-əǰ̓	[ʔáʔǰ̓iʔ ~ ʔáʔǰ̓i:]	*making it good*

g is realized as [g ~ w ~ u ~ k ~ x^{w}]

g ~ k voicing assimilation in Consonant clusters

(124) word-initial position

a.	git̓^{θ}it· čx^{w}	[gít̓^{θ}εčx^{w}]	*chop wood* (you?)
b.	guh-əm	[gúhɔm]	*to bark* (as a dog)
	gu-guh-əm	[gúguhɔm]	*barking*
c.	ga	[ga ~ gʌ]	imperative particle
	ʔiɬtan ga	[ʔέɬtəngʌ]	*go ahead, eat!*
	gaʔut̓	[gáʔot̓]	*oar*
	gat̓-ət	[gʌ́t̓ʌt]	*to pry up* tr.?
d.	gət̓^{θ}=ak^{w}up	[gáʔt̓^{θ}ak^{w}up]	*to split wood*
	gəč̓=iq^{w}an	[gʌ́č̓εq^{w}ən]	*bald, partially bald*
	gə-gč̓=iq^{w}an	[gə́wč̓εq^{w}ən ~ gə́wč̓] ??	*all bald head*
	gəq̓-t	[gʌ́q̓t^{h}]	*open it (door, window)*
	gəx̌ɬ	[gʌ́x̌ɬ]	*brave*

(125) medial position: between vowels (syllable initial)

a.	saygiɬ	[sáygɩɬ ~ sʌ́ygɩɬ]	*diaper*
	k̓ig-k̓igəm	[k̓ɛ́wk̓egɩm]	*coyote*
	ƛ̓ip=ig[i]s	[ƛ̓épegis]	*long johns*
	ƛ̓i-ƛ̓p=ig[i]s	[ƛ̓ɛ́ƛ̓pegɩs]	*small underwear*
	kʷum=igs	[kʷúmɛws]	*red snapper*
	kʷu-kʷm̓=ig[i]s	[kʷʊ́kʷəm̓egʸɩs]	*small red snapper* (dim.)
	ʔiʔagik̓ʷ	[ʔéʔagɩk̓ʷ ~ ʔɛ́ʔagɩk̓ʷ]	*clothes*
	nəgin	[nɩ́gin ~ nɩ́gɩn]	*lunch, bag lunch*
	nəgin=aya	[nɩ́ginàyɛ]	*lunch basket*
	t̓ig-[i]m	[t̓éigɩm]	*sweet*
b.	higus	[hégus ~ hé·gʊs]	*chief*
	šəʔt higus	[šɛ́ʔt hégus]	*God*
c.	ƛ̓agat[i]x̌	[ƛ̓ágatɛx̌]	*beating on a drum* (ƛ̓atx̌ *tap*)
	č̓ag-ət	[č̓ɛ́gʌt]	*help him!*
	hag-ət	[hágʌt]	*warm it up*
	qigaθ	[qégʌθ]	*deer*
	məga	[mʌ́g·ə ~ mə́g·ʌ]	*cougar*
d.	t̓ᶿagət̓=iqʷ=uǰa=tən	[t̓ᶿágət̓ɛ̀qʷoǰɩtən]	*ring*
	t̓əgəm	[t̓ʌ́gəm]	*sun*

(126) medial position: after a consonant and before a vowel (syllable initial)

a.	ni-ngin=aya+[ʔ]	[nínginàyɛʔ]	*small lunch basket*
b.	hi-hgus	[hɛ́hgʊs]	chief, rich in old way (dim.)
c.	x̌awgas	[x̌áwgʌs]	*grizzly bear*
d.	ɬax̌g-ət	[ɬáx̌gʌt]	*to destroy it*

(127) medial position: before a consonant (syllable final)

a.	k̓ig-k̓igəm	[k̓ɛ́wk̓egɩm]	*coyote*
	ƛ̓ip=igs	[ƛ̓épews]	*underwear*
	kʷum=igs	[kʷúmews]	*red snapper*
	k̓ʷit=igs	[k̓ʷɛ́:tews]	*vest*
	t̓ig=qin=tən	[t̓ɩ́kqètən]	*dessert* (cf. t̓igim sweet)
b.	ugC	----	----
c.	č̓ag-ng-may-əm	[č̓ɛ́wnomʌ́yɩm]	*I received help* (from him)
	hag-ʔəm	[hʌgʔʌm ~ hágʔʌm]	*warm (s.t.)*
d.	t̓ᶿəg-t̓ᶿagət̓=iqʷ=uǰa=tən	[t̓ᶿú·t̓ᶿagət̓ɛqʷoǰɩtən] stress	*rings* (pl.)
	təg=qin	[túwqɛn ~ tʊ́wᵊqɛn]	*answer back*
	tə-tg=qin+[ʔ]	[tə́tᵊgaqɛn̓]	*answering back*

(128) word-final position

a.	ig		
b.	ug		
c.	ag		
d.	yəg-əg	[yə́gəw]	*it got dry, getting dry*

g̓

(129) word-initial position - systematic gap: *R'/Onset

(130) medial position: between vowels (syllable initial)

a.	x̌awš=ag̓ič	[x̌ʌ́wšaʔᵊgɩč]	*spine*
	ɬəg̓=it̓ᶿa	[ɬáʔgit̓ᶿa ~ ɬáʔgit̓ᶿʌ]	*naked, without clothes*
	məmyag̓iʔ / mam ??	[mʌ́myæʔgeʔ]	*bumble bee*
	sa-syg̓iɬ	[sásiʔgɩɬ]	*small diaper*
b.	mi-mmag̓=uɬ	[mémᵊmaʔgʊɬ]	*real small kitten*

Appendix V: Sliammon Root List

This Appendix contains a representative sample of Roots in the language. The Root is the lexical core of content words (i.e. words which are translated as nouns, verbs, adjectives and adverbs in English). The Root is also the only obligatory element within the predicate complex (cf. Appendix VII) which is comprised of a Root plus affixes. This Appendix also provides information regarding the attested Root canons in Sliammon. It is organized in the following way: Roots with an initial Full Vowel /i, u, a/ are abbreviated here as CAC... and are often referred to as Strong Roots, as compared with Weak Roots which surface with an initial schwa: CəC.... Bound Roots are followed by a hyphen whereas free-standing Roots/Stems are not. There are a number of generalizations which emerge from this Appendix. There is only one CV Root in the language /θu/ or /hu/ which is the verbal auxiliary *to go.* The majority of Roots have at least two consonants (C_1 and C_2). There are also longer extended Roots (CVCVC), which are themselves often Stems. Roots which are even longer in shape tend to be either borrowed words, such as ʔatnupil, ʔatmupil [ʔátnopɛ̀l] 'car' from English 'automobile', or words which are most often translated as Nouns in English. Some of these longer Roots/Stems are unanalyzable from a synchronic perspective. There is also a small class of inherently reduplicated Roots/Stems, such as t̓ᶿit̓ᶿik̓ʷ 'worm', and muš-muš 'cow' which must be based on the Roots t̓ᶿik̓ʷ and muš respectively; however, these Root are not independently attested.

CA	hu ~ θu	*go*
CAC-	ɬik̓ʷ-	*sew* (cf. *sewing machine; gunny sack; repair net*)
CAC	ǰuk̓ʷ / ǰuʔk̓ʷ	*Indian rice* (cf. ǰuk̓ʷ *get crushed*)
CAC- / CəC	hiy- , həǰ	*make, build* (cf. =nač *bottom of basket*)
CAC	k̓ʷač̓	*dogfish*
CAC	k̓ʷas	*hot* (cf. *burn one's tongue*)
CAC	k̓ʷin	*how many*
CAC-	k̓ʷit-	*top of* (cf. *top of foot,* k̓ʷítiws *vest*)
CAC-	k̓ʷuƛ̓-	*salty* (cf. k̓ʷúƛ̓kʷu *salt water*)

CAC-	k̓ʷuɬ-	Root (cf. k̓ʷuɬ=’ay *maple tree*)
CAC-	k̓aʔ-	*to crow* (cf. k̓aʔ-əm)
CAC-	k̓ig-	Root (cf. k̓ig-k̓ig-əm *coyote*)
CAC-	ƛ̓ax̌-	*old* (cf. ƛ̓ax̌=ay *elder* ; *thumb*)
CAC	ƛ̓ip	*under, beneath, below*
CAC	ƛ̓uɬ	*to grow* (as plant) (cf. also *adopt a child*)
CAC-	ƛ̓uθ-	*work stone* (cf. [ƛ̓úθ-ʔəm] *hew, work with stone*)
CAC-	ƛ̓um-	*enough, sufficient (cf.* ƛ̓um- it *enough*)
CAC	ƛ̓up	*to heal*
CAC	ƛas	*glass* (< English *glass*)
CAC-	ƛiš-	*root* (cf. ƛiš=qin *saliva*)
CAC	ʔat̓ᶿ / ʔət̓ᶿ	*bay*
CAC	ʔah	*sore, pain*
CAC-	ʔaq̓-	*get chased* (cf. *chase him*)
CAC-	ʔaqʷ-	*go downstream (as in* ʔaqʷ-iš *to go downstream)*
CAC	ʔaxʷ	*falling snow*
CAC-	ʔay-	Root (cf. =ičin *back (of body)* ; say- *entire, whole*)
CAC-	ʔim-	*walk* (cf. ʔim-aš *walk* –aš *Intr.)*
CAC	ǰax̌ʷ	*to thaw, to melt*
CAC	ǰuʔ	*home* (cf. hu ga ǰuʔ *go home!*)
CAC-	ǰux̌ʷ-	*vomit (cf.* ǰux̌ʷ-at *to vomit)*
CAC-	x̌ʷah-	*get sent* (cf. -ʔəm *to send s.o.*)
CAC	x̌ʷas	*oil, fat* (cf. *suet*)
CAC-	x̌ʷiƛ̓-	Root (cf. x̌ʷiƛ̓ay *mountain goat* , *=ay animate*)
CAC-	x̌ʷup̓-	*poke* (cf. *making a basket*)
CAC	ɬak̓ʷ	*to swell up*
CAC-	ɬay-	Root (cf. ɬay=nač=tən *skirt*)
CAC	ɬixʷ	*lose a loved one*

CAC	ɬuk̓ʷ	*to fly*
CAC	ɬuq̓ʷ	*clear skies*
CAC-	ɬup-	Root (cf. =us *half bald*)
CAC-	ɬup̓-	peel (cf. ɬup̓-ut *to peel it*)
CAC	ťal	*basket ogress* (cf. Watanabe 2000 : ťəl)
CAC-	ťaq̓-	Root (cf. ťi-ťəq̓-ťaq̓=aʔaq *barn swallow*)
CAC-	ťᶿaǰ-	*to shade (from sun)*
CAC-	ťig-	*sweet* (cf. ťigim *sweet*)
CAC	ťin	*barbecued salmon*
CAC-	ťiq̓-	*sharpen* (cf. ťiq̓nis *to sharpen a blade*)
CAC-	ťip-	*barbecue meat*
CAC-	ťis-	Root (cf. *any bird*)
CAC-	ťiš-	*body fluid, mucus* (cf. *saliva, snot, eyes watering*)
CAC	ťᶿuk̓ʷ	*day, light, bright*
CAC-	ťᶿuʔ-	Root (as in ťᶿuʔ=čis *seven*)
CAC-	ťᶿum-	Root (cf. ťᶿum=aǰ̓u *barnacle*)
CAC-	ťug-	*be recognized* (cf. ťúgəxʷ *recognize s.b.*)
CAC-	ťuqʷ-	Root (cf. ťúqʷ=an̓a *snail, deaf*)
CAC-	ťuqʷ-	Root (ťuqʷ-əm *redcaps, thimbleberries; snail, deaf*)
CAC	x̌aƛ̓	*want*
CAC-	x̌aťᶿ-	Root (cf. *breast bone, sternum*)
CAC-	č̓ax̌-	*cook, fry* (cf. *microwave oven*)
CAC-	č̓ag-	help (cf. č̓ag='ay *wooden spoon;* č̓ag-at *help s.o.*)
CAC-	č̓ah-	*to greet, to thank, to pray* (with -əm)
CAC-	čiɬ-	*dance*
CAC	čuǰ̓ [čúy̓]	*baby, child* (not ones offspring)
CAC	x̌ap̓	*cradle basket*
CAC-	θap-	*bathe* (cf. *tub, bath tub*)

CAC-	θiy-	Root (cf. *floor*)
CAC-	gat̓-	*to pry up (cf.* gat̓-at *to pry it up)*
CAC-	guh-	*bark* (cf. guh-um *to bark (as a dog)*)
CAC-	has-	*sneeze* (cf. -əm *sneeze*)
CAC-	hiw-	*rich in the old way* (cf. higus *chief*; hiwčis *paddle*)
CAC	huǰ	*finish*
CAC	x̌it̓ᶿ	*iron* (metal)
CAC	x̌it̓ᶿ	*uncooked*
CAC-	x̌ič̓-	Root (cf. x̌ič̓-ič̓ *Fall, Autumn*)
CAC	kʷan̓ / kʷən̓	*that*
CAC-	kʷixʷ-	Root (cf. kʷíxʷ=uθin=tən *lipstick*)
CAC-	kʷum-	*reddish, pink, flushed* (cf. kʷum=iws *red snapper*)
CAC-	kʷup-	*hill* (cf. kʷúpƛ̓ač *Hernando Island*)
CAC-	kʷus-	Root (cf. kʷúsɛm *green, blue*; kʷusən *star*)
CAC	lus	*Rose* (name)
CAC-	mač̓-	Root (cf. máč̓usàʔya *flea*)
CAC	man	*father*
CAC-	mux̌ʷ-	Root (cf. mux̌ʷ=aǰu *belly button, navel*)
CAC	mus	*four*
CAC-	nat̓ᶿ-	*nod* (cf. nát̓ᶿusəm *to nod one's head*) check
CAC-	nam̓-	*like, similar*
CAC-	nam̓-	*to get rid of* (cf. nam̓-aš *get rid of s.t.*)
CAC-	nam-	*write* (cf. -ʔəm 'to write'; -ʔamin *pen, pencil*)
CAC	nan	*name*
CAC	nat	*night*
CAC	niʔ	*be there*
CAC-	nuh-	*invite to a feast, potlatch (with Mdl. nuh-um)*
CAC	q̓ʷit	*beach*

CAC-	q̓ʷuw-	Root (cf. q̓ʷúw=an̓a *ear*)
CAC-	q̓atᶿ-	*to gather people together* (cf. q̓atᶿ-aw plural suffix)
CAC-	q̓ač̓-	*bite* (cf. q̓ač̓-əm *to bite*)
CAC-	q̓ix̌-	*dye* (cf. q̓ix̌=iqʷan-əm *dye hair*)
CAC	q̓is	*get tied*
CAC	paL' / paL'a	*one*
CAC	pal̓	*heron*
CAC	pit	*low*
CAC-	puh-	*blow* (cf. puh-ʔəm *windy, to blow*)
CAC	pukʷ	*book*
CAC	pun	*spoon* (< English)
CAC-	puq̓ʷ-	*powder* (cf. *face powder*)
CAC-	pus-	*have lump, raised area* (cf. *lump neck; Adam's apple*)
CAC-	qʷan̓-	Root (cf. =iqʷɬa *knee*)
CAC-	qʷas-	bloom (cf. qʷas-am *flower*)
CAC	qʷay	*talk, speak*
CAC-	qʷiq̓ʷ-	*nail* (cf. qʷiq̓ʷ-əm *to nail (s.t.)*)
CAC-	qʷuɬ-	*wade (with Mdl.* qʷuɬ-um *to wade*)
CAC-	qʷuθ-	Root (cf. qʷúθnàč̓tən *cushion*)
CAC-	qʷup-	*body hair*
CAC	saL' / saL'a	*two*
CAC-	say-	*whole, entire* (?) (cf. say=an̓a *neck*)
CAC-	sil-	Root (cf. sil=aw̓txʷ *tent*)
CAC-	sin-	Root (cf. sín=kʷu *ocean*)
CAC-	šas-	*sneak up (cf.* šas-at *to sneak up to it*)
CAC-	šat-	*high* (cf. *high heels*)
CAC-	šuʔ-	*choose, select* (cf. šuʔ-ut *choose it*)
CAC	suq̓ʷ / swq̓ʷ	*crazy*

CAC-	sup-	*chop* (cf. *stump, tail*)
CAC	tan̓	*that one*
CAC-	tam-	*to desire* (cf. tam-aš *to desire s.t.*)
CAC	tam	*what?*
CAC	tan	*mother*
CAC-	tap-	*tight* (cf. *brassiere, corset*)
CAC	tih	*big*
CAC-	tuq̓ʷ-	Root (cf. tuq̓ʷ-əm *have a cold*)
CAC	wač	*watch* (< English)
CAC	wuk̓ʷ	*scoop net*
CAC-	wuč̓-	*knuckle, poke* (cf. wuč̓-ut*to knuckle s.o.)*
CAC	xʷaʔ	*no*
CAC-	xʷit̓ᶿ-	*swing* (cf. xʷít̓ᶿtən *swing for a baby*)
CAC-	x̌ʷip-	*sweep* (cf. *sweep floor; broom*)
CAC-	xʷuk̓ʷ-	Root (cf. xʷú:k̓ʷàyin *skunk cabbage*)
CAC-	yaɬ-	*call* (cf. yaɬ-at *to call s.o.)*
CAC-	yiq̓-	*need* (cf. yiq̓-it *disgusted with it; need it*)
CAC	p̓ix̌ʷ	*flood*
CAC-	p̓itᶿ-	*wash (wring out, wash by hand)*
CAC	p̓iq̓	*wide*
CAC	p̓uq̓ʷ	*brown, grey*
CACəC	ƛ̓aɬəm	*salt*
CACəC	ƛ̓iʔəm	*cockle*
CACəC	ʔal̓əs / ʔəl̓as	*sea cucumber*
CACəC	ʔit̓ᶿəm / ʔit̓ᶿəm̓	*blanket*
CACəC	x̌ʷil̓əm	*rope*
CACəC	t̓aɬəm	*cedar sticks (for basket)*
CACəC	t̓am̓əxʷ	*gooseberry*

CACəC	θat̓ᶿəm	*spring salmon*
CACəC	kipəm	*button*
CACəC	maθəč	*cormorant*
CACəC	qaw̓əm	*eye*
CACəC	šəmən	*enemy*
CACəC	wuwəm	*sing*
CACəC	p̓al̓atᶿ	*skunk*
CACəC	p̓aq̓əm	*green, yellow*
CACA	k̓ʷaw̓a / k̓ʷəw̓a	*belly, stomach*
CACA	k̓ʷaxʷa	*box*
CACA	k̓ʷut̓a	*barbecue stick*
CACA	ƛ̓in̓a	*oolichan oil*
CACA	ʔusa	*blueberry*
CACA	ǰaǰ̓a	*relative, tree*
CACA	t̓aqa	*salal berry*
CACA-	tᶿuk̓ʷi-	*to dip up* (cf. =kʷu *dip up water*)
CACA	x̌ákʷu	*cow parsnip, Indian rhubarb*
CACA	č̓an̓u	*dog*
CACA	čiya	*grandmother*
CACA	ham̓u	*pigeon*
CACA	kʷuma / kʷumaʔ	*ratfish*
CACA	kʷupa	*grampa*
CACA	kapi	*coffee*
CACA	kapu	*coat*
CACA	lusi	*Rose (name)*
CACA	mula	*mill* (<English)
CACA	šukʷa	*sugar* (< English)
CACA	sux̌ʷa	*urine; to urinate*

CACA-	taʔa-	*travel (taʔa=čis to travel, =čis LS)*
CACA	tala	*money*
CACA	way̓i	*skate* (fish)
CACA	p̓uhu	*raven*
CACA(C)	p̓ip̓i / p̓ip̓iy	*thin*
CACAC	k̓ʷun̓ut̓	*porpoise*
CACAC	k̓ʷuʔuxʷ	*smoked salmon, smoked fish*
CACAC	k̓ʷuyukʷ	*fish hook, troll for salmon*
CACAC	ƛ̓ič̓us	*Spring (season)*
CACAC	ƛ̓iq̓iw	*dark*
CACAC	ʔax̌iθ	*lie down*
CACAC	ʔawukʷ	*tobacco*
CACAC	ʔayaʔ	*house*
CACAC	ʔap̓uk̓ʷ	*maggots*
CACAC	ʔimaθ	*grandchild*
CACAC	ʔimin	*door*
CACAC	ʔupan	*ten*
CACAC	ǰuw̓akʷ	a wave (of water)
CACAC	x̌ʷusum	*Indian ice cream*
CACAC	x̌ʷuwit	*ditch, hallow*
CACAC	ɬan̓ukʷ	*animal hide*
CACAC	ɬag̓at̓	*herring*
CACAC	ɬix̌iw	*to catch a disease*
CACAC	t̓ap̓as	*cave*
CACAC	t̓in̓iqʷ	*salmonberries*
CACAC	t̓ᶿat̓iq̓	*a drop of water*
CACAC	t̓ᶿač̓iɬ	*numb*
CACAC	t̓ᶿiyič̓	*twisted*

CACAC-	ť̓išus-	*small salt water fish* (ť̓íšusəm *Sliammon; sm. fish*)
CACAC	ťuɬaɬ	*bed*
CACAC	ťupit	*wind, sundried fish*
CACAC	x̌aʔay	*bog cranberry*
CACAC	čalas	*three*
CACAC	čayiš	*arm, hand*
CACAC-	θapax̌ʷ-	Root (cf. =us *antler, horn*)
CACAC	θapiš	*bathe*
CACAC	θičim ~ θičim̓	*up in the back woods*
CACAC	θuθin	*mouth*
CACAC	θumin	*eyebrow*
CACAC	gaʔuť	*oar*
CACAC	haǰaqʷ	*to dig (a pit); steam-cook*
CACAC	hig̓an	*strawberry*
CACAC	hiyum̓	*seagull*
CACAC	x̌iʔič	*salmon after spawning*
CACAC	kikiʔ	*bug*
CACAC	layam	*devil*
CACAC-	mapal-	*dark* (cf. mapal=awus *pupil* (eye))
CACAC	maqin	*hair*
CACAC	masiqʷ	*purple sea urchin*
CACAC	mawič	*male deer, buck* (< Chinook Jargon)
CACAC	miʔin	*wild carrots, carrot*
CACAC	mix̌aɬ	*black bear*
CACAC	mimag̓ [mɛ́maw̓]	*cat (cf.* məga *cougar)*
CACAC	muʔus	*head*
CACAC	q̓ʷalas	*raccoon*
CACAC	q̓aʔut$^{\theta}$	*uvula; glutton*

CACAC	q̓ag̓an	*rose hip*
CACAC	q̓aťan	*rat*
CACAC	q̓aqiq^{w}	*sea wrack, bladder wrack (type of seaweed)*
CACAC	q̓iʔič	*moose*
CACAC	pilaq	*bracket fungus, mushroom*
CACAC	q^{w}aw̓iɬ	*pitch, chewing gum*
CACAC	q^{w}uwit	*beaver*
CACAC	qayax̌	*digging stick, root digger*
CACAC	qiʔiq^{w}	*any kind of fruit juice*
CACAC	qigaθ	*deer*
CACAC	qiyup	*stern of a boat*
CACAC	takin	*stocking, sock*
CACAC	taľič	*round*
CACAC	tiqiw	*horse*
CACAC	tituľ	*small*
CACAC	tumiš	*man*
CACAC	wax̌as	*frog*
CACAC	x^{w}uʔus	*porcupine*
CACAC	yay̓ič̓ / yay̓əč̓	*oregon grape berry*
CACAC	yax̌ay	*berry basket, clam basket*
CACAC	yiwup	*sail*
CACAC	p̓aľaťθ	*skunk*
CACAC	p̓aq̓iw	*deadfall*
CACACA	lamatu	*sheep* (< Chinook Jargon)
CACACA	wiǩaľi / wiǩaľa	*hermit crab* (cf. wa-waǩila *limpets*)
CACACAC	ƛ̓agatix̌	*beating on a drum*
CACACAC	ʔiʔagiǩ^{w}	*clothes*
CACACAC	hik^{w}iʔiq^{w}	*great-great-grandmother* (cf. hi-hk^{w}iʔiq^{w})

CACACCəC	p̓al̓asč̓ən /p̓al̓asč̓in	*pine cones*
CACC	k̓ʷaɬt	*dish, plate*
CACC	k̓ʷaq̓t	*to scream*
CACC	k̓ʷiƛ̓t	*upstream area*
CACC	ƛ̓aqt	*long*
CACC	ʔaqʷt	*downstream area* check
CACC	ʔasxʷ	*seal*
CACC-	ʔilq̓-	Root (cf. ʔilq̓ay *barbecued deer meat)*
CACC	ʔuʔp	*Church House* (place name)
CACC	ǰanxʷ	*fish, any salmon*
CACC-	x̌ʷatq̓ʷ- / x̌ʷat̓q̓ʷ-	*thunder*
CACC	t̓ayš	*blanket*
CACC	t̓ᶿiwq̓ʷ / t̓ᶿiwq̓	*red elderberry*
CACC	x̌aw̓s	*new*
CACC	čapθ	*parent's sibling, aunt, uncle*
CACC-	θiʔqʷ-	*left, left-hand side* (cf. =šin *left foot*)
CACC	kʷum̓t	*kelp*
CACC	kiks	*cookie*
CACC-	mamk̓-	Root (cf. mamak̓=igs=tən *window, mirror*)
CACC	maq̓ʷt̓ᶿ	*wild onions, onion*
CACC	mal̓qʷ	*fawn, young deer*
CACC	q̓ʷaǰ̓x̌	*wood, firewood*
CACC	q̓aʔƛ̓	*otter*
CACC	q̓aykʷ	*bald-headed eagle*
CACC	piwɬ	*rendered fat, lard*
CACC	qʷaʔɬ / qʷəʔɬ	*raspberry*
CACC	qʷač̓t	*to burp, to belch*
CACC	qʷanx̌	*crab apple*

CACC	qawθ	*potato, potatoes*
CACC	qayx̌	*Mink (stage name)*
CACC-	tal̓č-	*be round* (cf. tal̓[i]č *round*)
CACC-	waʔč-	*bowel movement* (cf. wáʔč=aw̓tx[w] *bathroom*)
CACC	walθ	*bullfrog*
CACC	x[w]uk[w]t	*nothing, none*
CACC	yax̌t	*rib*
CACCəC	ʔap̓tən	*green sea urchin*
CACCəC	t̓uʔnəx[w]	*cattails*
CACCəC	t̓ux[w]ʔəm	*huckleberry*
CACCA	k[w]uɬma	*to borrow*
CACCA	malya	*get married*
CACCA-	qayx̌a-	Root (cf. qáyx̌a=ƛ̓ač *kidney*)
CACCA	say̓ǰa	*leaf*
CACCA	watla	*sweetheart*
CACCAC	ƛ̓aʔɬum	*wolf* (cf. ƛ̓aʔɬʔum)
CACCAC	ʔiɬtan	*eat, food*
CACCAC	x̌[w]aʔx̌[w]it	*egg, eggs*
CACCAC	x̌[w]upx̌[w]up	*hummingbird*
CACCAC	ɬuɬmum̓	*littleneck clam*
CACCAC	ɬuq̓[w]ɬuq̓[w]	*oysters*
CACCAC	ɬuq[w]mut	*saps running*
CACCAC	t̓aqt̓aq	*slow*
CACCAC	t̓[θ]ix[w]t̓[θ]ix[w]	*fish hawk*
CACCAC	č̓uʔč̓uʔ	*wren (also recorded as č̓ɛč̓ɔʔč̓ɔʔ)*
CACCAC	x̌awgas	*grizzly bear*
CACCAC	θaʔpač	*antlers*
CACCAC	hum̓hum	*blue grouse*

CACCAC	kʷiškʷiš	*Steller's jay*
CACCAC	laplaš	*plank, long board* (< Chinook Jargon)
CACCAC	laspul	*soccer ball* (cf. ~ lastpul)
CACCAC	mušmuš	*cow*
CACCAC	qaymixʷ	*person, native person, First Nations person*
CACCAC	saplin	*bread*
CACCAC	siwsiw	*stinging nettles*
CACCAC	tuyʔap	*follow behind s.o.*
CACCAC	wiw̓lus	*young man at puberty*
CACCACAC	ʔatnupil̓, ʔatmupil	*car, auto* (< English *automobile*)
CACCACC	kamputs	*rubber boots* (< English *gum boots*)
CACCC	ʔapls	*apple* (<English *apples*)
CACCC	t̓ᶿamqʷL [t̓ᶿamqʷɬ]	*cloud*
CACCC	saɬtxʷ	*woman*
CACCCA	k̓ʷaʔsta	*cup*
CACCCAC	ƛ̓aʔɬʔum	*wolf*
CACCCAC	lastpul	*soccer ball* (cf. ~ laspul)

CəC	k̓ʷəy̓ [k̓ʷiʔ]	*tomorrow* (cf. k̓ʷiʔ səm *tomorrow*)
CəC-	k̓ʷən-	*see* (cf. *watch out, see*)
CəC-	k̓ʷəš-	*count* (cf. k̓ʷəš-t *count it*)
CəC-	k̓ʷət-	*hump, bump* (cf. k̓ʷə́tičən *humpback salmon*)
CəC-	ƛ̓əx̌ʷ-	Root (cf. ƛ̓əx̌ʷ=ay *chum, dog salmon*)
CəC	ƛ̓əq̓	*decay, rot, rotten*
CəC	ƛ̓əp	*deep, bottom*
CəC	ƛ̓əq	*out, go outside*
CəC	ƛ̓əqʷ	*hard, solid*
CəC-	ƛ̓əs-	*green, yellow, orange (cf.* ƛ̓əs-[i]m*)*

CəC-	ƛ̓əxʷ-	*beat, win (cf.* ƛ̓əxʷ-t *beat s.o. in contest)*
CəC-	ƛəx̌ʷ-	*spit* (cf. ƛəx̌ʷ-t *to spit it out*)
CəC-	ƛəm̓-	*wet (cf.* ƛəm̓-ƛəm *wet)*
CəC-	ƛəq-	Root (cf. ƛəq-əm *grass, straw*)
CəC	ʔəǰ̓	*good*
CəC-	ǰək̓ʷ-	*paint, rub* (cf. ǰək̓ʷ-t *paint it, rub it*)
CəC	ǰəƛ̓	*run*
CəC	ǰəq̓	*smooth*
CəC-	x̌ʷəw̓-	*light fire* (x̌əw̓-ət *light it;* x̌ʷ[a]w̓[i]t *fire*)
CəC	x̌ʷəs	*oil*
CəC-	x̌ʷəp̓-	Root (cf. =ayin *Labrador tea*)
CəC	x̌əƛ	*break* (rope, string)
CəC-	x̌əƛ-	*pluck* (cf. x̌əƛ=iws *pluck/feather a bird*)
CəC	ɬəx̌	*bad* (cf. =qin *raspy throat*)
CəC-	ɬən̓-	*to weave* (cf. ɬən̓-t *to weave blankets*)
CəC-	ɬəg̓-	*be without* (cf. ɬəg̓=it̓ᶿa *naked, without clothes*)
CəC	ɬəq̓ʷ	*arrow*
CəC-	ɬəqʷ-	Root (cf. *earring*)
CəC-	t̓ət̓ᶿ-	*bleed, red* (cf. t̓ət̓ᶿ-əm *to bleed;* t̓ət̓ᶿ-im *red*)
CəC-	t̓əq-	adhere (cf. t̓əq-t *paste it on, glue it*)
CəC-	t̓ᶿəx̌-	*be worn out* (cf. t̓ᶿəx̌=it̓ᶿa clothes worn out)
CəC	t̓ᶿəč̓	*bitter, sour* (cf. *mosquito; Sitka spruce*)
CəC-	t̓ᶿəkʷ-	*wipe* (cf. t̓ᶿəkʷ-t *wipe it*)
CəC-	t̓ᶿəm-	Root (cf. t̓ᶿə́mtən 'breast')
CəC	č̓əx̌	*ripe, cooked*
CəC-	č̓əʔ-	*on top of* (cf. [č̓uʔumixʷtən 'floor rug, carpet')
CəC	č̓əɬ	*rain*
CəC	č̓əq̓	*fence*

CəC	c̓əq	*tiny bird, robin*
CəC-	c̓ət-	*cut, slice* (cf. c̓ə́t-q=àmin *knife* ; c̓ət-ʔamin *saw*)
CəC-	θət̓ᶿ-	*jig* (cf. θət̓ᶿ-əm *to jig for cod*)
CəC	θəc̓	*flat, straight*
CəC-	θəkʷ-	Root (cf. θə́kʷnàčtən *chair*)
CəC-	θəq̓-	Root (cf. θəq̓=ay *sockeye salmon*)
CəC-	gət̓ᶿ-	*split* (cf. =akʷup *to split wood*)
CəC-	gəc̓-	*bald, bare* (cf. =iqʷan *bald, partially bald*)
CəC	gəq̓	*open* (cf. gaq̓-it *it's opened*)
CəC-	gəq̓ʷ-	*drag (cf.* gəq̓ʷ-t *drag it)*
CəC	kʷəy̓ [kʷiʔ]	*tomorrow*
CəC-	məx̌-	Root (cf. məx̌=awəɬ *half moon*)
CəC	məƛ̓	*calm (on water), no wind*
CəC-	məʔ-	*take* (cf. máʔəmk̓ʷum *pick berries*)
CəC-	məkʷ-	*eat* (cf. məkʷ-t *eat it*)
CəC	məq̓	*to get full from eating*
CəC-	məq̓ʷ-	*swallow (cf.* məq̓ʷ-t *swallow it*)
CəC	məs	*mink*
CəC-	nəp-	*under, inside*
CəC-	nəq-	Root (cf. nə-nq-əm *killer whale*)
CəC-	nəy-	*forget* (cf. 'to forget s.t.')
CəC-	q̓ən-	Root (cf. q̓ən=ayu *needle*)
CəC-	q̓əs-	*tired* (cf. q̓əs=ƛ̓ač laugh so hard)
CəC-	pən-	*bury* *(cf.* pən-aš *bury it*)
CəC	pəq	*white*
CəC-	pəqʷ-	*to rot, to decay*
CəC-	qʷəɬ-	*wash ashore* (cf. qʷəɬay̓ *driftwood*)
CəC	qʷəl̓	*come*

CəC	qəx̌	*many*
CəC	qəy̓	*to die* (cf. qəy̓-t kill it)
CəC-	qəh-	*hoist, lift (cf.* qəh-t *lift it up)*
CəC-	qəp-	Root (cf. qəp=iws-əm *make the sign of the cross*)
CəC-	səx̌-	Root (cf. səx̌-əm *racing canoe*)
CəC	səl-	*turn, spin* (səlsəl *turning, spinning*)
CəC	səq̓	*half, fifty-cent piece, half-breed*
CəC	səq̓	*peel (cf.* səq̓-t *peel it off* (e.g. wild cherry bark))
CəC-	səp̓-	*get hit*
CəC-	šəʔ-	*high, go up*
CəC-	šəm̓-	*dry* (cf. šəm̓-šəm *it's already dried*)
CəC-	šəq-	*sigh* (cf. šə́qθut *sigh*)
CəC-	tək̓ʷ-	*pull* (cf. tək̓ʷ-t *pull it*)
CəC	təg̓	*freeze (cf.* təg̓-t *freeze it)*
CəC	təm̓	*to tie, belt*
CəC-	təkʷ-	Root (cf. tə́kʷan̓a *deaf*)
CəC-	təš-	Root (cf. -θut *to get close*)
CəC	xʷət	*Swainson's thrush*
CəC	yəg̓	*it's been raining, and it's dried up*
CəC	yəp̓	*to break (as cup)*
CəC-	p̓əg̓-	Root (cf. p̓əg̓=ay *flounder, halibut*)
CəC	p̓əθ	*black*
CəC	p̓əq̓	*smoke* (from fire)
CəCəC	t̓əx̌əm	*six*
CəCəC	t̓əg̓əq̓ʷ	*clay*
CəCəC	t̓əgəm	*moon, sun*
CəCəC	t̓əqʷəm	*thimbleberry*
CəCəC	kʷəw̓əč	*sturgeon*

CəCəC	qʷəsəm	*grouse*
CəCəCəC	pələməs	*plum* (<English *plums*)
CəCA	x̌əʔa	*butter clam* (cf. diminutive x̌i-x̌ʔa)
CəCA	x̌əpi, x̌əpǰ	*to turn back*
CəCA	t̓ᶿəx̌ʷu	*ling cod*
CəCA	mən̓a	*one's child, offspring*
CəCA	məga	*cougar*
CəCA	pəču	*basket* (generic)
CəCa	pəpa	*pepper*
CəCA	qəǰi , qəǰy	*again, still*
CəCA	qəy̓a	*water*
CəCA	səm̓a	*mussel*
CəCA	təq̓ʷa	*octopus, devil fish*
CəCAC	ʔəl̓as / ʔal̓əs	*sea cucumber*
CəCAC	x̌əǰ̓is	*rock*
CəCAC	ɬəqiš	*go across*
CəCAC	θəy̓aɬ / θəy̓iɬ	*lake*
CəCAC	məǰaθ / məǰiθ	*meat*
CəCAC	məč̓in	*louse* (cf. =tən *fine-toothed comb*)
CəCAC	məsiqʷ, məsiq̓ʷ	*purple sea urchin (cf. məsq̓ʷ soft)*
CəCAC	nəxʷiɬ	*dugout canoe*
CəCAC	q̓əǰiƛ̓ / q̓aǰiƛ̓	*scar, a scar*
CəCAC	q̓əp̓ux̌ʷ	*nut*
CəCAC	qʷənis / qʷənəs	*whale* (not orca/killer whale)
CəCAC	səkʷum	*shiver*
CəCACA	t̓ᶿəčal̓i / t̓ᶿəčil̓i	*kingfisher*
CəCACA	kənika	*coloured person*
CəCACA	mətula	*Victoria*

CəCACA(C)	mənat̓ᶿi , mənat̓ᶿiʔ	*drum*
CəCACAC	ƛ̓əl̓aq̓an / ƛ̓əl̓aq̓in̓	*slug*
CəCACAC	čətuxʷan	*blackberry*
Cə-CACAC	q̓ə-q̓ayas	*barrel*
CəCACCA	xʷəl̓uwla	*spiked* (cf. *spiked heels, high heels*)
CəCC	k̓ʷəɬt	*plate, tray*
CəCC-	k̓əlθ-	*bent, crooked* (cf. k̓il[i]θ *be crooked*)
CəCC	ƛ̓əč̓t	*sleep*
CəCC-	ƛ̓əms-	*reside, house* (cf. ƛ̓əmis *reside* ; ƛ̓əmstan *village*)
CəCC	ƛəpxʷ	*broke* (cf. ƛáƛapxʷ *pocket knife*)
CəCC	ʔəsp̓	*end, finish (cf.* ʔas[i]p̓ *to call s.o. down)*
CəCC	ʔəwk̓ʷ, ʔuwk̓ʷ	*be all gone; none; all*
CəCC	x̌ət̓k̓ʷ	*have a design, get carved*
CəCC-	ɬəx̌g-	*to destroy*
CəCC	t̓ət̓ᶿš	*to squirt*
CəCC	t̓əkʷs	*to burst*
CəCC-	t̓əlk̓-	*get/make hole*
CəCC	t̓ᶿəmš	*soaked*
CəCC	ləps	*canvas shoes, runners*
CəCC	məθkʷ	*blackcap berry*
CəCC	məlx̌ʷ	*dipper , Greybird*
CəCC-	məsq̓ʷ-	*soft* (cf. məsq̓ʷ-əm *soft*)
CəCC-	q̓ət̓x̌ʷ-	Root (cf. q̓ə́t̓x̌ʷ=us *skull*)
CəCC-	pəɬq̓-	*slippery* (cf. pəɬq̓-əm *slippery*)
CəCC	pəɬt	*thick*
CəCC-	pəlkʷ- , pəl̓kʷ-	*roll* (cf. pəlkʷ-ət *roll s.t. over*)
CəCC	qəmk̓ʷ	*to capsize, tip over*
CəCC-	qəms-	*store away*

CəCC-	p̓əƛš-	*float, surface* (cf. p̓ə́ƛšígiɬ *launch a canoe*)
CəCC	p̓ət̓ᶿt	*tin can, tin*
CəCC	p̓əθk	*bullhead (fish)*
CəCCəC	t̓ᶿəmtəq	*oolichan, candlefish*
CəCCəC	məqsən	*nose*
CəCCəC	pəlməs	*plum* (<English *plums*)
Cə-CCəC	qʷə-qʷwəx̌	*duck, any duck*
CəC-CəC	wəx̌-wəx̌	*cigarette*
CəCCəC	xʷum̓yəč / xʷum̓yič	*skin*
CəCCA	θəy̓θa / θiʔθa	*that one (fem.)*
CəCCA	ləkli	*key* (Fr. <Chinook Jargon)
CəCCA	q̓ʷəsʔi	*lung*
CəCCA	təy̓ta	*that one (gen.)*
CəCCA	təkʷɬi	*rabbit*
CəC-CAC	ƛən̓-ƛan	*real shy*
CəCCAC	q̓əsnaǰ̓	*dress*
CəC-CAC	pəč-pič	*awake*
CəCCAC	qʷəšʔim	*dolphin*
CəC-CAC	səy̓-say̓	*scared*
CəCCACA	hənkala /hən̓k̓ala	*pot (cook in)*
CəC-CACAC	x̌əg̓-x̌ag̓aɬ	*chipmunk*
CəCCCACA	hənkƛala / hən̓kƛala	*pot (cook in)* (cf. Watanabe 2000: hankɬala)

Appendix VI: Sliammon Lexical Suffixes

The following Lexical Suffixes (LS) are a sample of those attested in the data collected in this study (1988-2000) and are listed alphabetically by their general English gloss. For the most part, I use the "cover" terms adopted in Watanabe (2000) for ease of cross-reference, and include additional glosses which indicate the range of extended meanings for each LS. The examples are organized from a *phonological perspective* within each data set and are listed according to the place and manner of articulation of the root-initial consonant and first vowel of the root: i, u, a,ə. Exceptions to this include forms involving numbers in which case it seems more natural to cite them in numerical order.

Some of the LSs discussed by Watanabe (2000, Chapter 8) do not occur in the present data base, and are therefore not discussed here; these include: =čsən *Forehead*, =iθx̌an *Armpit*, =am *Inside of a container*, =anxʷ *Fish runs*, =ənʔaɬ *Child*, and =taɬ *Fathom*. The reader is referred to Watanabe (2000: 186-189) for a discussion of the stative/non-stative forms of these LSs. I have listed the non-stative forms here and indicate stative forms where relevant.

Lexical suffixes identified here which do not appear in Watanabe (2000) include the following: =x̌iθ *Bed*, =aymixʷ *Breast*, =anč Character, =tan *Enclosure*, =ay *Person* (non-productive), =ay-i *People*, =igan *Sentiments*, =əqsən *Nose* (non-productive), =əɬp *Tree* (non-productive), =aǰ̓u *Way to get food; bait* (?).

Ankle	=ay̓iq̓ʷan
Appearance	=umiš
Area between legs	=aq , =aq̓
Arm	=ayax̌an, =ay̓ax̌an
Armpit	=iθx̌an
Back	=ag̓ič
Back	=ičən
Bed	=x̌iθ
Belly	=law̓i

Berries	=um, =um̓a
Blanket	=ukʷ-t
Body	=igs
Bottom	=nač
Breast	=aymixʷ
Breath	=aʔaɬaɬ
Canoe, vehicle	=igiɬ
Character	=anč
Cheek	=aǰ̓is
Chest	=inas
Chin	=aǰ̓itiq
Clothes, cloth	=it̓ᶿa
Cloud, sky above	=ayi=tn
Corner	=ax̌an
Cup-shaped object	=awuɬ
Day of week	=s
Door	=šagɬ
Ear (HW)	=aʔana
Enclosure	=tan̓
End, shape	=ayin ~ =ayin̓
Eye	=awus
Fathom	=taɬ
Field	=iyaʔkʷ
Finger	=iqʷ=uǰ̓a
Fire, firewood	=akʷup
Floor	=umixʷ
Food	=ɬaw
Foot, lower leg	=šən / =šin

Hand (non-productive)	=čis
Hand (productive)	=uǰ̓a
Hat	=ayuq^w ~ =ayʔiq^w
Head, round object	=us
Heel	=ap=šən
House	=mix^w
House, dwelling	=aw̓tx^w
Instrument	=ayu
Instrument	=min
Instrument	=tn
Intestine	=ƛ̓ač
Intestine	=ayč̓
Knee	=iq^{w}ɬa
Leaf, stalk	=aǰ̓a
Lid	=ipan
Mattress	=aʔaɬ , =aʔɬ
Mouth (inside), language	=qin
Mouth, lips (external)	=uθin
Neck, ear	=an̓a
Net	=ǰan
Nose (non-productive)	=əqs̓n
Nose	=iq^w
Outside	=aw̓uɬ
People	=ay-i
Person (non-productive)	=ay
Person	=ay-a
Place	=aya (~ =ala)
Rock	=ays

Roof	=tx^{w}
Roots	=k^{w}um
Sentiments, inner part	=igan
Shoulder	=aʔamčis
Side (of body)	=wum
Smell	=aqap
Tens	=šaʔ
Thigh	=anaq
Throat	=agt̓$^{\theta}$
Throat	=qaƛay, =qƛay
Throat	=ɬaɬ
Times	=aɬ
Times: combined	=iɬ
Toe	=aw̓u=šən
Tongue	=ix^{w}θaɬ
Tooth, cutting edge	=unis, =nis
Top of head	=iq^{w}an
Tree, bush (non-productive)	=əɬp
Tree, bush (productive)	=ʔay̓
Water	=k^{w}u
Wave (of water)	=unax^{w}
Way to get food	=aǰ̓u
Wind, weather	=aʔaq
Young of species	=úɬ

Examples:

Ankle:	=ay̓iq̓ʷan	**Indep. form:**

(1)

a. say=ay̓iq̓ʷan	[sáyɛʔɛq̓ʷʌn]	*ankle*

Appearance:	=umiš	**Indep. form:**

(2)

a. tih=umiš	[tíhomiš ~ tíhomɩš]	*chubby, fat* (cf. tih *big*)
b. nam̓=umiš	[náʔmòmɩš]	*look like s.o.* (cf. nam̓ *like, similar*)
c. ɬx̌=umiš	[ɬʌ́x̌ʷomɩš]	*ugly, bad looking* (cf. ɬəx̌ *bad*)
d. ʔǰ̓=umiš	[ʔáʔǰumɩš]	*beautiful* (lit: good looking)

Area between legs, inside of thigh	=aq̓ ~ =aq	**Indep. form:**

(3)

a. qʷup=aq̓	[qʷó·pʌq̓]	*pubic hair*
b. IMP-sum=aq̓-θay-m a [1]	[só:sòmʌq̓θèma]	*Are they gathering around you?*
b'. IMP-sum=aq̓-t-uw-m	[sósoməq̓tùwʊm]	*they're gathering around us (cedar roots)*
c. RED-say-n=aq	[sísayᵊnʌq]	*groin, pubic area*

This LS may also occur in a number of wildlife terms:

(4)

a. DIM-puɬ=nač=aq-aɬ+[ʔ]	[púpɬaʔnàčɛqʌɬ]	*jelly fish* (way it moves through water)
b. t̓ay=aq=min	[t̓áyɛqmɩn]	*clam shell*
c. IMP-qʷat̓il=aq̓	[qʷáqʷat̓èlʌq̓]	*butterfly* (reflects motion)
d. ƛ̓l̓=aq̓-n	[ƛ̓áʔlaq̓ʌn]	*slug*

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[1]The stem sum=aq̓-at is used to mean 'gather underneath one, to come up underneath one, to gather plentifully around one' and is used to refer to tasks/harvesting which are done between the legs, like root digging, clam digging, and berry picking.

d'. DIM-ƛ̓í=aq̓-n+[i]+[ʔ]	[ƛ̓íƛ̓aʔlàq̓ɛn̓]	*small slug*

Arm, upper (elbow to shoulder): =ayax̌an, =yx̌an

(5)

a. ɬiq̓ʷ-im=ay-ax̌an	[ɬɛ́q̓ʷèʸmayʌx̌ən]	*feel quiver on right arm* (good omen)
b. qʷup=yx̌an	[qʷópex̌ʌn]	*hair under arm* (cf. qʷup- *body hair*)
b'. DIM-qʷup=ay-ax̌an	[qʷóqʷpayàx̌ʌn]	*hair on arms*
c. say=ay̓-ax̌an	[sáyaʔyʌx̌ʌn]	*elbow* (cf. say-)
d. θg̓=ay-ax̌an	[θáʔgayɛ̀x̌ʌn]	*sliver in elbow*
e. č̓m̓=ay-ax̌an č	[č̓ɛ́ʔᵊmàyɛx̌ʌnčʰ]	*my arms got cold* (cf. č̓m̓ *cold*)
f. DIM-q̓ƛ̓=ay-ax̌an č	[q̓áq̓ƛ̓ayʌx̌ənč]	*I've got short sleeves* (cf. q̓ƛ̓ *short*)

Armpit, underarm

a. qʷup=iθx̌an	[qʷópeθx̌ʌn]	*hair under arms*

Back: =ičən, =ičin (stv.) **Indep. form:** ʔayičin [ʔáyyɩčɩn] *back*

(6)

a. q̓ʷt=ičən	[q̓ʷátičin ~ q̓ʷʌ́tičin]	*humpback salmon* check
a'. DIM-q̓ʷt=ičən	[q̓ʷɛ́q̓ʷtečɩn]	*small humpback salmon*
b. k̓ʷt=ičən	[k̓ʷʊ́tečin ~ k̓ʷʊ́tečɩn]	*humpback salmon* check
b'. k̓ʷt=ičən=šn	[k̓ʷítičɩnšɩn ~ k̓ʷí]	*top of foot*
c. mx̌=ič[i]n	[mʌ́x̌ečin]	*divided in half* (stv.)

Back, spinal column: =ag̓ič , =agič (stative) **Indep. form:** ʔayičin [ʔáyyɩčɩn] *back*

(7)

a. p̓iq=agič	[p̓éqagɩč]	*turtle* (cf. p̓iq *wide*)
b. t̓ᶿiyč̓=ag̓ič	[t̓ᶿíyč̓àʔgičʰ]	*twisted spine* (cf. t̓ᶿiyč̓ *twisted*)
c. wuč̓=agič č	[wú:č̓ɛgɩčʰčʰ]	*I have s.t. poking my back*
d. x̌awšin=ag̓ič	[x̌áwšinàʔᵊgɩč]	*spine* (cf. x̌awšin *bone*)

e. ƛpx^{w}=ag̓ič	[ƛʌ́px^{w}áʔgɩč]	*break one's back* (cf. ƛpx^{w} *break*)
f. ƛ̓ɬ=ag̓ič	[ƛ̓ə́ɬaʔgič]	*stiff back*

Bed: =x̌iθ , =ax̌iθ **Indep. form:** ʔax̌iθ [ʔáx̌ɛθ] *lay down*

(8)

a. sux̌^{w}a=x̌iθ	[sóx̌^{w}ax̌ɛθ]	*to wet one's bed* (cf. sux̌^{w}a *urinate*)
a'. sux̌^{w}a=igs-m	[sóx̌^{w}ɛwsəm]	*to wet one's pants*
b. IMP-q^{w}ay=ax̌iθ	[q^{w}áq^{w}ayʌ̀x̌ɛθ]	*talking in one's sleep* (cf. q^{w}ay *speak, talk*)

Belly, counting bottles: =law̓i

(9)

a. paL'=law̓i	[páylàwɛʔ]	*one bottle*
b. saL'=law̓i	[sáylàwɛʔ]	*two bottles*
c. mus=law̓i	[móslàwɛʔ]	*four bottles*
d. q̓aʔ=law̓i	[q̓áʔlaweʔ]	*sea worm*

Berries: =uma, =um

(10)

a. t̓in=uma	[t̓ɛ́noma]	*berry* (cf. t̓ɛn *barbecue fish*)
b. maʔəmk̓^{w}=um	[máʔʌmk̓^{w}um]	*pick berries*

Blanket, covering, hide, pelt, skin: =uk^{w}-t

(11)

a. k^{w}um=uk^{w}-t	[k^{w}úmʊk^{w}t]	*red blanket* (cf. k^{w}um- *red*)
b. takin=uk^{w}-t	[tǽkinùk^{w}t^{h}]	*sweater* (cf. takin *stocking, knitted*)
c. ɬan̓=uk^{w}	[ɬáʔ^{a}nʊk^{wh}]	*deer skin*
d. pq=uk^{w}-t	[pʌ́qok^{w}t^{h}]	*white blanket* (cf. pq [pʌ́q] *white*)
e. CəC$_{PL}$-t̓m̓-uw=uk^{w}-t	[t̓ʌ́mt̓àʔ^{ə}mowùk^{w}t^{h}]	*making a quilt* (cf. təm̓ *tie, belt*)

f. t̓t̓ᶿim=ukʷ-t	[t̓áʔt̓ᶿemʊkʷtʰ]	*red blanket* (cf. t̓t̓ᶿ-m [t̓áʔt̓ᶿəm] *bleed*)
g. č̓ɬ=ukʷ-t	[č̓íɬ(h)òkʷtʰ]	*rain coat* (cf. č̓ɬ [č̓íɬ] *rain*)
h. kʷsim=ukʷ-t	[kʷʊ́semʊkʷt]	*blue jeans* (cf. kʷəsim *blue*)
i. x̌ʷiƛ̓=aǰ=ukʷ-t	[x̌ʷɛ́.ƛ̓a.ǰʊkʷtʰ]	*mountain goat blanket* (x̌ʷɛ́ƛ̓ay *mtn. goat*)

Body, whole body: =igs (=iws), =ig[i]s **Indep. form:** giʔiws [gíʔeyus] *whole body*

(12)

a. miǰaθ=igs	[méǰaθews]	*flesh* (miǰaθ *meat, flesh*)
b. ƛ̓ip=igs	[ƛ̓épews]	*underwear* (cf. ƛ̓ip *under*)
c. č̓in=igs	[č̓í:news]	*bone up front of lower leg, shin*
d. k̓ʷit=igs	[k̓ʷɛ́:teʔus ~k̓ʷɛ́:tews]	*vest*
e. qigaθ=igs	[qé:gaθews]	*deer meat* (cf. qigaθ *deer*)
f. kʷum=igs	[kʷúmews]	*red snapper* (cf. kʷum- *red*)
g. kʷan=igs-m	[kʷánewsʌm]	*to rest (one's body)* (cf. kʷan- *rest*)
g'. kʷan=igs-m-'uɬ a čxʷ	[kʷánewsàʔmoɬæ̀čxʷ]	*Did you rest?*
g''. kʷan=igs-it č	[kʷánewsičʰ]	*I already rested*
h. p̓ƛš=igs [2]	[p̓ʌƛšèws]	*chicken pox, measles* (p̓ƛš *come to surface*)
i. pq=igs	[pʌ́qɛws]	*pale body* (cf. pəq *white*)
j. tm̓=igs=tn	[táʔmewstən]	*garter (for stockings)* (cf. təm̓ *to tie, belt*)
k. ƛ̓q=igs-m	[ƛ̓ʌ́qewsəm]	*chicken pox*
l. qp=igs-m	[qʌ́pewsəm]	*make sign of the cross*
m. x̌ƛ=igs	[x̌ʌ́ƛews]	*to feather a bird* (cf. x̌ƛ- *pluck*)
n. IMP-ʔh=igs č	[ʔáʔhewsč]	*my body is aching* (cf. ʔəh *ache, sore*)

[2] This can be used to refer to any skin affliction in which the infection comes to the surface of the skin. See also p̓ƛš=igiɬ [p̓ʌƛšigɩɬ] *put a boat in the water, launch a canoe.* Given the relationship between these words I assume this root means something like *be on the surface, come to the surface.*

Bottom, base, behind, backsides: =nač

(13)

a.	t̓ᶿip̓=nač	[t̓ᶿéᵊp̓ᵊnʌčʰ ~ nač]	*pointed tail* (cf. t̓ᶿip̓ *sharp, pointed*)
b.	tih=nač	[tí:nəčʰ]	*it's empty* (cf. tih *big*)
c.	RED-č̓iƛ̓=nač	[č̓í:č̓ɩƛ̓ᵊnač]	*short tail* (cf. č̓iƛ̓ *short*)
d.	hu č θiq=nač-'uɬ	[hóč θéqnač̓uɬ]	*I went digging roots*
d'.	IMP-θiq=nač č	[θéθɛqnàčʰčʰ]	*I'm digging roots* (cf. θiq *dig*)
e.	hiy=nač	[héynʌč] ~ [híynʌč]	*bottom of a basket*
f.	qʷuθ=nač=tn	[qʷóθᵊnàčtn̩]	*cushion*
g.	sup=nač	[sópnʌč]	*tail* (cf. sup- *chop*)
h.	CəCPL-sup=nač=min	[sə́psopᵊnəčmìn]	*stumps* (cf. sup- *chop*)
i.	IMP-ǰug=nač-t-as	[ǰíǰugᵊnàčtʌs]	*he's coiling it up (a rope)*
j.	ʔuʔɬtxʷ=nač	[ʔóʔɬtunæč]	*salamander*[3] (cf. ʔuɬtxʷ *come inside*)
k.	tat=nač=ap	[tátnàčɛp ~ tátᵊnačɩp]	*hip, buttocks, whole hip*
l.	ƛ̓aqt=nač	[ƛ̓áqtənač]	*high-waisted* (cf. ƛ̓aqt *long*)
m.	kali=nač	[kélinʌč]	*Kelly!!!* (expressing frustration)
n.	kʷan=nač-m	[kʷánačɩm]	*sit down* (cf. kʷan- *rest*)
o.	DIM-saxʷil=nač	[sásᵊxʷɛlnʌ̀č]	*salt grass* [4]
p.	ɬay=nač=tn	[ɬáynačtən]	*skirt*
p'.	CəCPL-ɬay=nač=tn	[ɬí:ɬaynàčtn̩]	*lots of skirts*
q.	xʷat̓q̓ʷ-am-u=nač	[xʷát̓q̓ʷamònač]	*puff ball*[5] (cf. xʷat̓q̓ʷ-am *thunder*)

[3]Apparently you are not supposed to go near salamanders; be careful not to step over them, touch them nor make fun of them. If you do, he'll follow you home and crawl up your bum.

[4] Salt grass grows on the tidal flats. The male plant flowers - the Sliammon people ate the stocks of the female plants only.

[5] The word for this bell-shaped mushroom literally means "thunder-shit". Traditionally, the dust from the puff ball was used to help clean clothes. The dust from the puff ball was also mixed with urine in order to make a hair tonic, which made one's hair shiny.

(14) **CC Roots**

a. ƛm̓ƛm=nač — [ƛə́m̓ƛəmnʌč] — *wet bum* (cf. ƛəm̓ƛəm *wet*)

b. čn=nač — [čɩ́nnač] — *head of the inlet*

c. č̓ʔ=nač=tn — [č̓ɛ́:nàčtɩn ~ č̓ɛ́ʔnàčtɩn] — *small blanket to sit on*

d. kʷm̓=nač — [kʷʌ́ʔᵊmnɩčʰ] — *cedar roots*

d'. DIM-kʷm̓=nač — [kʷíkʷʔəmnač] — *small (cedar) roots*

e. k̓ʷt̓ᶿ=nač-t [6] — [k̓ʷʊ́t̓ᶿᵊnačtʰ] — *turn it over (a boat)* (cf. kʷət *go over*)

f. q̓ƛ̓=nač — [q̓ʌƛ̓ᵊnačʰ] — *bobbed tail, like bob-cat* (cf. q̓ƛ̓ *bobbed*)

g. θkʷ=nač=tn — [θʊ́kʷᵊnàčtɩn ~ tn̩] — *chair*

g'. θkʷ=nač=tn-hV č — [θʊ́kʷnʌčtè:hɛ̀nčʰ] — *I've got a chair*

h. sq=nač — [sʌ́qnač] — *tow, towing*

i. mƛ̓=nač — [mʌ́ƛ̓ᵊnəčʰ] — *Mitlenatch Island* (cf. məƛ̓ *calm*)

j. np=nač — [nʌ́pʰnačʰ] — *pants, underpants* (cf. nəp- *inside*)

(15) **CCC Roots**

a. ƛpxʷ=nač — [ƛʌ́pxʷᵊnač] — *break one's tail bone* (cf. ƛpxʷ *break*)

b. šʔt+[i]=nač — [ší:tʰnàčʰ] — *on edge of seat; ready-to-run; bottom in air*

c. lʔt=nač — [lʌ́ʔtnač ~ lɩ́ʔtʰnač] — *flabby bottom* (cf. [láʔtɛt] *sag, flab*)

Breast: =aymixʷ **Indep. form:** t̓ᶿm=tn [t̓ᶿə́mtən ~ tn̩] *breast*

(16)

a. tap=aymixʷ=tn — [tápʌymìxʷtn̩] — *brassiere, bra* (tap- *tight*)

b. np=aymixʷ — [nə́paymɩxʷ] — *breast milk* (cf. nəp- *inside*)

c. DIM-lt=aymixʷ — [léltaymɩxʷ] — *breasts hanging (without a bra)*

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[6] This means to 'turn the boat upside down' or 'turn it bottom up' so that the rain, sand, etc., won't get in it.

Breath: =aʔaɬaɬ, =aʔa=ɬaɬ

(17)

a. ʔuwk̓ʷ=aʔaɬaɬ	[ʔú:k̓ʷaʔaɬaɬ]	*he's not breathing anymore*

Canoe, boat, vehicle: =igiɬ **Indep. form:** nəxʷiɬ [nʊ́xʷɩɬ] *canoe*

(18)

a. čalas=igiɬ	[čέlʌsìgɩɬ]	*three boats*
b. p̓ƛ̓š=igiɬ	[p̓ʌ́ƛ̓šìgɩɬ]	*put boat in the water* (p̓ƛ̓š *float, on surface*)
c. t̓ᶿx̌=nač=igiɬ	[t̓ᶿʌ́x̌načɩgɩɬ]	*bottom of boat is worn out* (cf. t̓ᶿx̌ *worn out*)
d. IMP-ɬq̓-ay=igiɬ	[ɬʌ́ɬq̓ayìgʌɬ]	*patching a boat*
e. IMP-hy̌=igiɬ	[háhᵊy̌ɩgɩɬ]	*building a boat* (cf. həy=mixʷ *build a house*)

Character, humour, kind: =anč

(19)

a. DIM-ɬx̌=anč-m+[i]+[ʔ]	[ɬέɬx̌ančɩm̓]	*angry* (cf. ɬx̌ [ɬʌ́x̌] *bad*)

Cheek: =ay̓is **Indep. form:** say=ay̓is [sáyεʔy̌ɩs] *cheek*

(20)

a. ƛ̓ik̓ʷ=ay̓is	[ƛ̓έk̓ʷaʔᵃy̌ɩs]	*fish cheeks (in soup; round shaped)*
b. qʷum=ay̓is-t	[qʷómàʔy̌ɩstʰ]	*to kiss (s.o.) on the cheek*
c. tat=ay̓is	[tátaʔy̌ɩs]	*cheek* (cf. tat-)

Chest: =inas **Indep. form:** [ʔéyinas] *chest*

(21)

a. ʔiy=inas-m č ʔay-	[ʔéyinʌsəmč]	*I feel it in my chest* (visitors are coming)
b. qʷup=inas	[qʷópenʌs]	*hair on chest*
c. x̌at̓ᶿ=inas	[x̌á:t̓ᶿenʌs]	*breast bone, sternum*

d. ƛ̓kʷ=inas	[ƛ̓ʊ́kʷinʌs]	*heart*
e. IMP-ǰk̓ʷ-m=inas	[ǰéyk̓ʷamènʌs]	*heart burn* (cf. ǰə-ǰk̓ʷ *rubbing*)
f. ntx̌-[i]m=inas	[nʌ́tx̌emènʌs]	*heart beat*

Chin: =aǰ̓itiq

(22)

a. ƛ̓iʔp=aǰ̓itiq	[ƛ̓ɛ́ʔpaǰɪtὲq]	*chin* (cf. ƛ̓ip *under*)

Clothes, cloth: =it̓ᶿa , =it̓ᶿàʔ (stv.) **Indep. form:** ʔiʔagik̓ʷ [ʔéʔagɪk̓ʷ] *clothes*

(23) =it̓ᶿa

g. ƛ̓ip=it̓ᶿa	[ƛ̓ɛ́pet̓ᶿʌ]	*slip, lady's slip* (cf. ƛ̓ip *under, deep*)
a. ɬg̓=it̓ᶿa-m	[ɬáʔᵃgɪ̀t̓ᶿəm]	*take off one's clothes (coat)* (ɬg̓- *undress*)
a'. ɬg̓=it̓ᶿa(ʔ)	[ɬáʔgɪ̀t̓ᶿʌ ~ ɬáʔgit̓ᶿàʔ]	*naked*

(23.1) -ay=it̓ᶿa ~ -ay̓=it̓ᶿa

a. p̓it̓ᶿ-ay=it̓ᶿa	[p̓ét̓ᶿayit̓ᶿəʰ]	*wash clothes* (cf. p̓it̓ᶿ *wash, wring, squeeze*)
a'. p̓it̓ᶿ-ay=it̓ᶿa=tn	[p̓ét̓ᶿayit̓ᶿatən]	*washing machine* (cf. p̓it̓ᶿ-it *squeezed*)
b. ɬik̓ʷ-ay=it̓ᶿa=tn	[ɬé:k̓ʷay̓it̓ᶿatʌ̀n]	*sewing machine* (cf. ɬik̓ʷ *sew*)
c. x̌ʷiqʷ-ay̓=it̓ᶿa=tn	[x̌ʷɛ́qʷaʔyit̓ᶿatən]	*washboard*
d. hakʷ-ay=it̓ᶿa	[hʌ́kʷay̓it̓ᶿʌ]	*clothes hangingon line* (hakʷ/həkʷ *hang up*)

(24)

a. ʔit̓ᶿ-m	[ʔit̓ᶿəm]	*blanket*
a'. ʔt̓ᶿam̓as	[ʔʌ́t̓ᶿaʔmʌs]	*shawl*

Cloud, sky above, weather: =ayi=tn **Indep. form:** t̓ᶿamqʷɬ *cloud*

(25)

a. niʔ=ayi=tn	[nɛ́ʔayitən]	*cloudy, thick clouds* (niʔ *exist, be there*)

b. mahi=ayi=tn	[máhyɛyitən]	*mid-day, noon*
c. č̓ɬ=ayi=tn	[č̓íɬayitən]	*looks like rain (see it in the sky); rain clouds*

Corner: =ax̌an

(26)

a. q̓ʷit=ax̌an	[q̓ʷɛ́:tàx̌ʌn]	*front of the house* (cf. q̓ʷit [q̓ʷɛ́t] beach)
b. θič-m=ax̌an	[θíčmàx̌ʌn]	*back of the house* (go round the back)

Cup-shaped object, canoe, half-shell: =awuɬ

(27)

a. mus=awuɬ	[mósawʊɬ]	*four boats*
b. t̓ᶿuʔ=čis=awuɬ	[t̓ᶿóʔčisàwʊɬ]	*seven boats*
c. ʔupan=awuɬ	[ʔópʌnàwʊɬ]	*ten boats*
d. mus=awuɬ mt̓ay	[mósawʊɬ máʔt̓ʌy]	*four horse clams on the half shell*
e. θiya=čis=awuɬ mt̓ay	[θíyɛčisawʊɬ máʔt̓ʌy]	*five horse clams on the half shell*
f. t̓x̌m=awuɬ mt̓ay	[t̓ʌ́x̌ʌmàwʊɬ máʔt̓ʌy]	*six horse clams on the half shell*
g. t̓ᶿuʔ=čis=awuɬ mt̓ay	[t̓ᶿóʔčisàwʊɬ máʔt̓ʌy]	*seven horse clams on the half shell*
h. taʔa=čis=awuɬ mt̓ay	[táʔačisawʊɬ máʔt̓ʌy]	*eight horse clams on the half shell*
i. tigixʷ=awuɬ mt̓ay	[tígʸixʷàwʊɬ máʔt̓ʌy]	*nine horse clams on the half shell*
j. ʔupan=awuɬ mt̓ay	[ʔópʌnàwʊɬ máʔt̓ʌy]	*ten horse clams on the half shell*
k. mx̌=awuɬ	[mʌ́x̌awʊɬ]	*half moon*
l. np=awuɬ	[nə́pawʊɬ]	*in a boat, in a car* (cf. nəp- *inside*)
m. čk̓ʷ=əw̓uɬ	[čɛ́ʔk̓ʷoʔwʊɬ]	*sides of a basket*
n. ʔuwuɬ	[ʔówʊɬ]	*to board a canoe, to get on a boat*

Day (of the week): =s **Indep. form:** t̓ᶿuk̓ʷ [t̓ᶿók̓ʷ] *day, daylight*

(28)

a. paL'=s [7]	[pá̓ʔas]	*Monday* [8] (first day)
b. saL'=s	[sá̓ʔas]	*Tuesday* (second day)
c. čalas=s	[čɛ́:lʌs:]	*Wednesday* (third day)
d. mus=s	[mós: ~ móss]	*Thursday* (fourth day)
e. θiyačis=s	[θíyɛčɩs:]	*Friday* (fifth day)

Door, road, path: =šawɬ, =šaw, =šagɬ **Indep. form:**

(29)

a. ƛa=šaw-ʔm	[ƛášɛwʔəm]	*to knock, rap (on s.t. esp. door)*
a'. ƛa=šaw-t-'uɬ č	[ƛášɛwtòɬč]	*I knocked on his door*
b. kʷt=šaw̓ɬ	[kʷʊ́tšɛw̓ɬ]	*switch to other side of road* (kʷət *go over*)
c. kʷt=šawɬ ga	[kʷʊ́tšɛ̀wɬ gʌ]	*stay on the side of the road!*

Ear (see also Neck): =ʔana[9], =an̓a **Indep. form:** [q̓ʷówʔana] *ear*

(30)

a. DIM-tih=ʔana	[títhaʔàna]	*big ears*

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[7] This is the only LS reported for Sliammon which consists of a single consonant. In terms of its canonical shape, it is suspect since all other lexical suffixes in the language are either minimally bimoraic, such as -VC or consist of a syllable CəC, such as =šən. It may be possible to analyze the final s as the third person possessive marker -s rather than as a LS. This is a topic for further research.

[8] The forms for 'Saturday' and 'Sunday' are as follows: [t̓áq̓ʷtəm] ~ [t̓óq̓ʷtəm] *Saturday* and [χáχʔaɬnʌtʰ] ~ [χáχaɬnʌtʰ] (lit: holy night) *Sunday.* One consultant also reports that her parents used [yɛ́ʔyaw] *Monday* instead of the form given above. Sundays are counted in order to keep track of the weeks, moons are counted in order to keep track of the months, and snows are counted for the years: [pá̓ʔa χáχʔaɬnʌt] *one (Sunday) week* , [pá̓ʔa t̓ʌ́gʌm] *one (moon) month* , and [pá̓ʔa qʷóʔmʌy] *one (snow) year* .

[9] Watanabe (2000:190) posits =aʔana, =aʔan̓a (stv.) as the form of the LS for ear. From the perspective adopted here the first [a] appears to come from epenthetic [a] after a consonant cluster and before the LS =ʔana, as in /tlk̓=ʔana/ təlk̓[a]ʔana [tʌ́lk̓ɛʔàna] *hole in ear,* and DIM-qʷup=ʔana / qʷu-qʷp[a]ʔana [qʷóqʷpaʔàna] *hair sticking out of ears.*

b.	CəCp$_L$-ƛ̓iqʷ=ʔana	[ƛ̓ə́qʷƛ̓ɛqʷʔana]	*earlobes*
c.	DIM-qʷup=ʔana	[qʷóqʷpaʔàna]	*hair sticking out of ears*
d.	paL'=ʔana	[payʔana]	*bundle of roots (packed on shoulder)*
e.	t̓ᶿx̌ʷ=an̓a-m	[t̓ᶿóx̌ʷaʔnàʔəm]	*wash one's ears*
f.	tl̓k̓=ʔana	[tʌ́lk̓ɛʔàna]	*hole in ear*

Enclosure: =tan **Indep. form:**

(31)

a.	ʔap̓=tan	[ʔáp̓tən]	*green sea urchin*
b.	ƛ̓q̓ʷ=tan	[ƛ̓ə́q̓ʷtan ~ ƛ̓ʊ́q̓ʷtan]	*wall (of building)*
c.	ƛ̓ms=tan	[ƛ̓ə́mstan]	*house(s), village* (ƛ̓ə́mɛs *where one resides*)

End, extremity, shape: =ayin, =ayin̓

(32)

a.	t̓ᶿip̓=ayin̓	[t̓ᶿɛ́p̓ayɩn̓]	*sharp, pointed (ends)*
a'.	DIM-t̓ᶿip̓=ayin+[ʔ]	[t̓ᶿɛ́t̓ᶿᵊp̓àyɩn̓]	*triangle*
b.	DIM-put̓ᶿ=ayin	[pópt̓ᶿayɛn]	*uneven, crooked shape*
c.	xʷuk̓ʷ=ayin	[xʷú:k̓ʷàyɩn]	*skunk cabbage*
d.	q̓ač̓=ayin	[q̓áʔᵊčɛyɩn]	*Indian Hellebore* [10]
e.	say=ayin̓	[sáyayɩ̀n̓] HLH	*Texada Island, Blubber Bay*
f.	ǰaq̓=ayn̓	[ǰɛ́q̓ayɩn̓]	*leaning, tilted, not upright*
g.	RED-tl̓[i]č=ayin̓	[táʔtəlečèyɩn̓]	*oval, has rounded ends* (cf. tal̓[i]č *round*)

[10] The bulb of the Indian Hellebore (also known as False Hellebore) is recognized as a deadly poison. It looks like a sweet potato, and is finely grated in order to make a purified liquid tonic. The purified liquid is then used in very small amounts for cleansing and purification in a personal sweat lodge. It causes a violant physical reaction and is noted to improve one's sense of smell. It was sometimes administered to a hunting dog in order to ensure that the dog's sense of smell was keen. The purified liquid is also used on cuts and bruises.

h. ƛ̓əm̓ƛ̓əm=ayin̓ [ƛ̓ʌ́m̓ƛ̓aʔmàyɩn̓] *long, with square ends*

i. θqt=ayin̓ [θʌ́qʌtàyɩn̓] *leaning* (board leaning on roof); θʌ́qʌt *steep*

i'. θqt=ayin təy̓ta [θʌ́qʌtàyɩn tí:ta] *he's standing there doing nothing* (leaning)

j. ɬqiš=ayin̓ [ɬʌ́qešàyɩn̓] *bridge*

k. ɬq̓=ayin=tn [ɬʌ́q̓ayitən] *pike pole* (used by boom man)

l. lʔt=ayin [láʔtàyɩn] *lob-sided* (láʔtɛt *flopped on couch, flabby*)

Eye: =awus **Indep. form:** qaw̓um [qáʔwʊm] *eye*

(33)

a. t̓ik=awus-m [t̓ɩ́kɛwùsəm] *to wink*

b. DIM-t̓ᶿip̓=awus [t̓ᶿɛ́t̓ᶿp̓awʊs] *slanted eyes* (cf. t̓ᶿip̓- *pointed*)

c. ƛ̓ip=awus [ƛ̓épawus] *area below the eye* (cf. ƛ̓ip *under*)

d. CəC$_{PL}$-qʷup=awus [qʷɔ́pqʷopàwʊs] *eyelashes* (cf. qʷup *body hair*)

e. tala=awus [táləhàwʊs] *eye glasses* (cf. tala *money*)

f. ɬak̓ʷ=awus č [ɬák̓ʷawʊ̀sčʰ] *my eye is swelling up* ([ɬá:k̓ʷɛ̀t] *swollen*)

g. CəC$_{PL}$-qap̓=awus [11] [qʌ́p̓qap̓awᵊs] *bats* (qap̓- *cover*)

h. šʔt=awus [šáʔtawus ~ šɛ́tawus] *area above eye, eyelid* (cf. šʔt *high, above*)

i. ƛ̓a-ƛ̓atx̌=awus-m [ƛ̓áƛ̓atx̌àwʊsəm] *tapping on window* (cf. ƛ̓ətx̌- *tap*)

Field: =iy̓ikʷ, =y̓ikʷ

(34)

a. sy̓ikʷ [sáʔyɩkʷ] *prairie, tide flats*

c. sy̓ikʷ-it (stv.) [sɛ́ʔyekʷɩt] *mud flat, point of land when tide's out*

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[11] According to one consultant, the Sliammon people believe that if a bat gets you and puts its wings over your eyes you won't be able to see; you'll be blinded. This as the reason why you're not supposed to make fun of bats.

b. CəC_PL-qʷy=y̓ikʷ	[qʷéyqʷeʔᵊyɩkʷ]	*big sandbar*

Finger: (elongated object=hand) =iqʷ=uǰa, =iq̓ʷ=uǰa **Indep.:** xʷaw̓=iqʷ=uǰa [xʷáʔwɛqʷòʔǰɛ] *finger*

(35)

a. np=iqʷ=uǰa=tn	[nʌ́peqʷòʔǰɛtə̀n]	*thimble* (cf. nəp- *inside, cover*)
b. qap̓=iqʷ=uǰa=tn	[qáp̓ʔɛqʷòʔǰætən]	*finger nail* (qap̓ *cover?*)
c. sʔt=iqʷ=uǰa	[sáʔᵊteqʷòʔǰɛ]	*to signal with the thumb* (šʔt- go upwards)
d. kit̓=iqʷ=uǰa	[kʸɛ́t̓eqʷòʔǰɛ]	*pinky, little finger* (cf. kit̓ kʸɩt̓ *small*)
d'. kt̓=iqʷ=uǰa	[kʸɛ́ʔt̓ɛqʷòʔǰɛ]	*pinky, little finger* (cf. kt̓)
e. x̌ʷt̓ᶿ=iq̓ʷ=uǰa	[x̌ʷʌ́t̓ᶿɛq̓ʷòʔǰɛ]	*wrist*
f. ƛ̓ax̌=iqʷ=uǰa	[ƛ̓áx̌ɛqʷòʔǰɛ]	*thumb* (cf. ƛ̓ax̌ *old*)
g. ƛ̓as-am=iqʷ=uǰa	[ƛ̓ásameqʷòʔǰɛ]	*middle finger* (cf. ƛ̓asʌm *strong*)

Fire, light, firewood: =aɬ-kʷup, =akʷup, =ap=ukʷ **Indep. form:** x̌ʷw̓it [x̌ʷáʔwɩt] *fire*

(36) **Indep. form:** q̓ʷaǰx̌ [q̓ʷʌ́yx̌ ~ q̓ʷéy̓ᵊx̌] *wood*

a. ʔaɬay-aǰ=akʷup=tn	[ʔáɬayɛ̀ǰɛkʷùptn̩]	*poker for the fire* [12]
a'. ʔaɬay̓-aǰ=akʷup=tn	[ʔáɬaʔyɛ̀ǰɛkʷùptn̩]	*poker for fire*
b. q̓ʷuʔin=aɬ-kʷup	[q̓ʷóʔɛnàɬkʷùpʰ]	*ashes* [13]
c. IMP-ʔitq̓=ap	[ʔɛ́ʔɛtq̓ʌp]	*gathering firewood*
c'. git̓ᶿ=ap=ukʷ	[gít̓ᶿapʊkʷ]	*split firewood*
d. IMP-git̓ᶿ=ap=ukʷ č	[gígit̓ᶿàpʊkʷčʰ]	*I'm splitting firewood*

Floor, earth, ground, land: =umixʷ **Indep. form:**

(37)

a. xʷip=umixʷ	[xʷípomɩxʷ]	*sweep the floor* (cf. xʷípʔəm *sweep (s.t.)*)

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[12]They used to use an iron-wood (Rock Spiraea) stick to fix the fire.

[13]Watanabe (2000) records qʷənʔiɬkʷup 'ash'.

b. θqat=umixʷ	[θʌ́qʌtòmɩxʷ ~ -tù-]	*steep hill, shore*
c. IMP-c̓t=umixʷ+[ʔ]	[c̓íc̓toʔᵒmɩxʷ]	*he's cutting the grass* (cf. c̓ət *cut*)
c'. c̓t=umixʷ=tn	[c̓ítòmɩxʷtə̀n]	*scythe (for cutting grass)*
d. CəC$_{PL}$-ǰƛ̓=umixʷ	[ǰέƛ̓ᵊǰεʔƛ̓òmɩxʷ]	*car (running on land)* (cf. ǰəƛ̓ *run*)
e. RED-tač=umixʷ	[títačòmɩxʷ]	*any animal*
f. c̓ʔ=umixʷ=tn	[c̓óʔomὲxʷtən]	*rug on floor*

Food, food supplies (stored away) =amiɬ **Indep. form:** ʔiɬtən [ʔέɬtən] *food, to eat*

(38)

a. suwtič=amiɬ	[sówtičàmɩɬ]	*winter food* (cf. sówtič ~ sótɩč *winter*)
b. ʔuwk̓ʷ=amiɬ	[ʔú:k̓ʷamɩɬ ~ . mεɬ.]	*to run out of food* (ʔuwk̓ʷ *all used up, none*)
c. qx̌=amiɬ	[qʌ́x̌:àmɩɬ]	*lots of food* (cf. qx̌ [qʌx̌] *lots, many*)
c'. qx̌=amiɬ	[qʌ́x̌hàmɩɬ]	*lots of food* (cf. qx̌ [qʌx̌] *lots, many*)
d. qms=amiɬ	[qʌ́msamɩɬ]	*food stored for winter* (cf. qəms- store away)

Food: =ɬaw **Indep. form:** ʔiɬtan [ʔέɬtʌn] food, eat

(39)

a. t̓ᶿx̌=ɬaw-m	[t̓ᶿʌ́x̌ɬawʊm]	*gather food in salt water* (cf. t̓ᶿx̌ʷ *wash*)
b. ƛ̓a=ɬaw-um	[ƛ̓áɬawʊm]	*any berry*

Foot, lower leg, toe, tide: =šən ~ =šin ~ =šin̓ **Indep. form:** ǰšn [ǰíšɩn] *foot, lower leg*

(40)

a. np=šin	[nə́pšin]	*trip, foot caught in s.t.*
a'. np=šən	[nə́pšɩn]	*bone marrow*
b. t̓ᶿx̌ʷ=šin̓-m	[hóč t̓ᶿóx̌ʷšiʔnəm]	*wash one's feet* (cf. t̓ᶿəx̌ʷ *wash*)
c. sp̓=šən	[sʌ́p̓ᵊšɩn]	*get hit on the leg* (cf. sp̓ *get hit*)
c'. sp̓=šin-ʼuɬ č	[sʌ́p̓šiʔᵊnòɬčʰ]	*I got hit on the leg* (cf. sp̓ *get hit*)

d. qʷup=šən	[qʷópšɩn]	*hair on legs*
d'. DIM-qʷup=š[i]n+[ʔ]	[qʷóqʷpəš̓iṅ]	*little bit of hair on legs* (cf. qʷup- *hair*)
e. x̌aw=šin	[x̌áwᶷšɩn]	*bone*
f. qʷɬaẏ=šən	[qʷə́ɬeʔš̓ɩn]	*shoe, shoes* (cf. qʷə́ɬaẏ *driftwood*)
g. ƛ̓q̓=šən	[ƛ̓ʌq̓šɩn]	*moccasins*
k. pq=šin	[pʌ́qšin]	*white root* [14] (cf. pəq *white*)
k'. CV$_{PL}$-pq=šən	[pápqšɩn]	*white feet, lower legs* (lack of sun exposure)
l. k̓ʷaq̓-aɬ=šən	[k̓ʷáq̓aɬšɩn]	*split sole (of foot)*
m. pɬq̓=šin (stv.)	[pə́ɬq̓əš̓in]	*to slip (foot slips)*
m'. pɬq̓=šn-'uɬ a čxʷ	[pə́ɬq̓əšɛ̓ʔnoɬæ̀čxʷ]	*Did you slip?* (already happened)
n. hy̓=šiṅ	[hʌ́yš̓ɩṅ ~ hə́yš̓ɩṅ]	*ladder*
o. DIM-x̌itᶿ-aɬ=šin+[ʔ]	[x̌ɛ́x̌t̓ᶿaɬšiṅ]	*cork boots* (loggers cf. x̌it̓ᶿ [x̌ɛt̓ᶿ] *iron*)
p. č̓lq̓=šin-m	[č̓ɩ́lq̓əš̓inəm]	*cross one's legs*
q. wuč̓-aɬ=šin č	[wú:č̓ɛɬšɩnč]	*I have s.t. poking under my foot*
r. θg̓-aɬ=šin	[θáʔgʌɬš̓in]	*sliver in foot*

Although the following lexical items are not analyzable from a synchronic perspective, they may contain this LS.

(41)

a. q̓ʷit-ɬ=šən	[q̓ʷíƛ̓šɩn]	*starfish* (cf. q̓ʷit *beach - "beach foot"*)
b. t̓ᶿuk̓ʷ=šin-m	[t̓ᶿók̓ʷšinəm]	*spring tide, day-time tide* (t̓ᶿuk̓ʷ *daylight*)
c. IMP-ƛ̓iq̓ʷ=šin-m	[ƛ̓éƛ̓ɛq̓ʷš̓inəm]	*becoming a night-tide*

Hair: =iy-qin ~ i-qin **Indep. form:** maqin [máqɛn] *hair*

(42)

[14] This is a white root which grows at the head of the inlet, and is eaten by geese. Perhaps water parsnip, or salt grass (?).

a. CH-ƛ̓q̓=iyqin	[ƛ̓ʌq̓ƛ̓ʌq̓tɪʸqɛn]	*long hair*
b. ɬaq̓ʷ=iqin	[ɬáq̓ʷeqɛn]	*one braid (of hair)*
c. Ca$_{PL}$-ɬaq̓ʷ=iqin	[ɬáɬq̓ʷeqɛn]	*two braids (of hair)*
d. kʷum=aqin	[kʷúmaqɩn]	*sea lion* ("having lump/s.t. on his head")
e. pič=aqin	[píčaqɛn]	*triangle, lean too, pyramid shaped*
f. čəp=aqin	[čípaqɛn]	*lean too, slanted roof*

Hand (not productive): =čis **Indep. form:** čayiš [čɛ́yɩš] *hand*

(43)

a. θiya=čis	[θíyɛčɩs]	*five*
a. t̓ᶿuʔ=čis	[t̓ᶿóʔčis]	*seven*
c. taʔa=čis	[táʔačis]	*eight*
b. IMP-hiw=čis-ma	[héhəwčisʸmaʰ]	*paddling (with one paddle)*

Hand (productive): =uǰa ~ =uǰ ~ =uǰaʔ (stv) **Indep. form:** čayiš [čɛ́yɩš] *hand*

(44)

a. ƛpxʷ=uǰa	[ƛʌ́pxʷuʔǰɛ]	*break one's arm, hand*
b. č̓t=uǰa	[č̓ítoʔǰɛʰ]	*cut one's hand*
c. šɬp̓=uǰa	[šɩ́ɬp̓òʔǰɛ]	*to slip out of one's hand*
d. č̓m̓=uǰa	[č̓éʔᵊmoʔǰɛʰ]	*cold hands*
e. t̓ᶿik̓ʷ=uǰa	[t̓ᶿɛ́k̓ʷùʔǰɛ]	*left-handed*
f. p̓it̓ᶿ=uǰa-t-'uɬ č	[p̓ét̓ᶿoʔǰɛtoɬč]	*I squeezed her hand* (cf. p̓it̓ᶿ- *squeeze*)
g. ƛ̓iʔ=uǰa	[ƛ̓óʔoʔǰɛ]	*fast with hands, fast picker*
h. θg̓=uǰa	[θáʔguʔǰɛ ~ θáʔguǰɛʔ]	*sliver in hand*
i. t̓ᶿkʷ=uǰa=tn	[t̓ᶿókʷuʔǰàtn̩]	*napkin* (cf. t̓ᶿəkʷ-t *wipe it*)

There is also another allomorph (surface variant) of this LS =uy̓ . Recall that ǰ̓ alternates with y̓.

(45)

a. IMP-t̓ᶿx̌ʷ=uy̓-m	[t̓ᶿə́t̓ᶿx̌ʷoyʔʌm]	*washing one's hands*

Hat: =ayuqʷ , =ayʔiqʷ **Indep. form:** θǰaqʷup [θíǰεqʷɔp] *hat*

(46)

a. θǰap=uqʷ	[θíǰæ̀poqʷ ~ θíǰὲpoqʷ]	*hat*
b. takin=ayuqʷ	[tákʸinàyoqʷ]	*knitted hat, toque*
c. ƛ̓qam=ayʔiqʷ	[ƛ̓ʌ́qamàyʔεqʷʰ]	*straw hat*
d. č̓ɬ=ayʔiqʷ	[č̓íɬay(ʔ)εqʷ]	*rain hat*

Head, top of head, hair, high point: =iqʷan ~[=iqʷən] **Indep. form:** maqin [máqεn] *hair*

(47) **Indep. form:** muʔus [mó́ʔos] *head*

a. sp̓=iqʷan-θ-as	[sáʔp̓εqʷà:θʌs]	*he hit me on the head*
a'. sp̓=iqʷan-ʔm=min	[sáʔp̓èqʷanʔὲmɪn]	*fish club, club* (esp. for salmon)
b. IMP-ʔt̓-m=iqʷan	[ʔáʔt̓əmèqʷʌn]	*hair is falling out*
c. x̌im=iqʷan-t-m	[x̌έmeqʷàtəm]	*get clawed in the head*
d. tih=iqʷan	[tíhεqʷʌn]	*big head*
e. t̓ᶿip̓=iqʷan	[t̓ᶿép̓eᵊqʷʌn]	*pointed head*
f. np=iqʷan	[nə́pεqʷan]	*brain*
g. DIM-p̓iy=iqʷan	[p̓έp̓əy̓iqʷʌn]	*cradle spot on baby's head*
h. gč̓=iqʷan	[gʌ́č̓εqʷən]	*(partially) bald*
i. p̓s=iqʷan	[p̓ʌ́sεqʷʌn]	*numb head, can't think*
j. xʷulk̓ʷ-ay=iqʷan=tn	[xʷúlk̓ʷàyεqʷàtən]	*hair ribbon*
k. pq=iqʷan	[pʌ́qhεqʷən]	*blonde hair; female name* (pəq [pʌq] *white*)

l. paL'=iqʷan [15]	[páwʔɛqʷən]	*one coiled bundle of cedar roots*
m. šʔt=iqʷan	[šɛ́ʔteqʷʌn ~ šá]	*top of mountain*
n. qy̓a=iqʷan	[qéʔeqʷʌn ~ qéyʔèqʷʌn]	*Savary Island* (cf. qy̓a [qáʔyɛ] *water*)[16]
n'. q̓iʔ=iqʷan	[q̓éʔeqʷʌn]	*Savary Island* (cf. q̓ɛ́q̓eʔ *juicy, soft*)
o. tt̓ᶿim=iqʷan	[táʔt̓ᶿemèqʷʌn]	*red head (red hair)*
p. q̓ix̌=iqʷan-m	[q̓ɛ́x̌eqʷʌnəm]	*dye hair*
q. ǰk̓ʷ=iqʷan-m	[ǰɛ́ʔk̓ʷeqʷʌnəm]	*to rub (dye on) hair*
r. xʷs=iqʷan	[xʷʊ́shɛ̀qʷən]	*black hair*
s. p̓θ=iqʷan	[p̓ʌ́θhɛqʷən]	*black hair*
t. p̓uq̓=iqʷan	[p̓óq̓eqʷən]	*light brown hair* (p̓oq̓ʷ *grey, brown*)
u. pq=iqʷan	[pʌ́qeqʷan]	*blonde*
v. x̌is=iqʷan	[x̌ɛ́sɛqʷʌn]	*curly hair*
w. IMP-č̓iys=iqʷan	[č̓ɛ́č̓ɛyɛsɛqʷʌn]	*hair is all tangled*

Head, face, round objects (money, fruit): =us **Indep. form:** muʔus [mʊ́ʔos] *head*

(48)

a. ɬup̓=us-t	[ɬóp̓ɔst]	*to peel s.t.*
b. nat̓ᶿ=us-m	[nát̓ᶿosəm]	*nod one's head* (up and down= yes)
c. lʔt=us	[láʔtos]	*face hanging down, "sad sack"* (láʔtɛt *flab*)
d. kʷt=us-m	[kʷʊ́tosəm]	*turn around* (kʷət *turn over*)
d'. kʷt=us-m-'uɬ a čxʷ	[kʷʊ́tosàʔᵊmoɬæ̀čxʷʰ]	*Did you turn around?*
e. wuč̓=us-θi tᶿəm	[wú:č̓osθɛtᶿəm]	*I'll knuckle you in the head* (cf. *knuckle s.o.*)

[15] This term refers to a bundle of cedar roots which are already cleaned and split. The lengths of cleaned roots are doubled over, hung to dry and then bound at one end. The resulting bundle bears a strong resemblance to the shape and size of a human head.

[16] One elder suggets that this name for Savary Island may mean "having water on top" - referring to the fact that Savary Island has a large number of fresh water springs and that the fresh water is very close to the surface. I have recorded two different variants of this place name which requires further checking to confirm the appropriate form. In the meantime, I include both variants here.

f. p̓iq̓=us	[p̓ɛ́q̓ʷos ~ p̓ɛ́q̓ʷos]	*broad face* (cf. p̓iq̓ *wide*)
g. ʔix̌ʷ=us-t	[ʔɛ́x̌ʷostʰ]	*to peel vegetables (potatoes)* (ʔix̌ʷ *carve*)
h. sax̌ʷ=us-m	[sáx̌ʷosəm]	*shave one's face* (sax̌ʷ *shave*)
h'. sax̌ʷ=us-m-'uɬ a čxʷ	[sáx̌ʷosàʔᵊmoɬǽčxʷ]	*Did you shave?*
i. q̓t̓x̌ʷ=us	[q̓ʌ́t̓x̌ʷos]	*mind, skull*
j. tiǰ=us-m	[tíǰo:səm]	*wash one's face*
k. IMP-ʔǰ̓-am=us=tn	[ʔáʔǰɛmɔ̀stn̩]	*face keeps changing; mask* (ʔəǰ̓ *good*)
l. tih=us	[tí:hos]	*big head* (cf. tih *big*)
m. λ̓əsim̓=us	[λ̓ísɛmos]	*pale face (sick, anemic)* (cf. *green, yellow*)
m'. pq=us	[pʌ́qos]	*pale face* (cf. pəq *white*)
n. nam=us	[námus]	*picture, photo (of s.o.)*
o. tm̓=us=tn	[táʔᵊmòstn̩]	*headband* (cf. təm̓ *tie, belt*)
p. CəC_{PL}-mč̓in=us	[míč̓ᵊmaʔčɩnos]	*freckles (lots of them)* (cf. máʔč̓ɩn *louse*)
q. paL'=us	[páwʔus]	*one dollar*
r. saL'=us	[sáwʔus ~ sáwʔʊs]	*two dollars*
s. sow̓=us-m	[sóʔwusəm]	*shake one's head* (side-to-side= no)

Heel, behind	=ap	**Indep. form:** kʷup=ap=šn [kʷúpapšin] *heel*

(49)

a. DIM-tᶿip̓=ap=š[i]n	[tᶿɛ́tᶿp̓apšin]	*high heels* (narrow, sharp, pointed heels)
b. kʷup-kʷup=ap=šn	[kʷúpkʷupʔʌpšɩn]	*heels (plural)*
c. tuy=ap	[tóyʌp]	*follow behind (s.b.)* (at heels)
c'. tuy=ap-t-'uɬ č	[tóyʌptòɬč]	*I followed behind him*
d. ɬaq̓ʷ=nač=ap	[ɬáq̓ʷnačɩp]	*one braid of hair* (down back)

Heel (non-productive)	=xən ~ =xin

(50)

a. xʷal̓uwlaxin	[xʷál̓owlàxɩn]	*spiked heels, high heels* (like deers hooves)

a'. xʷil̓uwlaxin	[xʷíl̓owlàxɩn]	*spiked heels, high heels (shoes)*

Hip:	=amap ~ =əmap	**Indep. form:** qmp [qʌ́mʌp] *thigh, top of leg*
(51)		
a. qmp	qʌ́mʌp ~ qám:ʌp	*lap*
a'. CəC$_{PL}$-qmp	qə́mqəmʌp	*both thighs, one's lap*

House, dwelling, room:	=aw̓txʷ	**Indep. form:** ʔayaʔ [ʔáyɛʔ] *house*
(52)		
a. tiwš-am=aw̓txʷ	[tíwšɛmàw̓txʷ]	*place of learning* (cf. títiw̓šɛ̀m̓ *learning*)
a'. kʷul=aw̓txʷ	[kʷúlaw̓txʷ]	*school* (< kʷul / kul *school*)
b. č̓ah-m=aw̓txʷ	[č̓ɛ́hamàw̓txʷ]	*church* (cf. č̓ah-m *pray*)
b'. č̓ah-m=aw̓txʷ	[č̓ɛ́hamòʔtxʷ]	*church*
c. ǰanxʷ=aw̓txʷ	[ǰɛ́nxʷàw̓txʷ]	*cannery* (cf. ǰanxʷ *fish*)
d. kʷt-m=aw̓txʷ	[kʷʊ́təmawtxʷ ~ kʷɩ́t]	*hospital, sick house* (cf. kʷət-əm *be sick*)
d'.	[kʷʊ́taʔᵃmàw̓txʷ]	*hospital*
e. sux̌ʷa=aw̓txʷ	[sɔ́x̌ʷʔàw̓txʷ]	*bathroom* (cf. sux̌ʷa *urine*)
f. waʔč=aw̓txʷ	[wáʔčʌw̓txʷ ~ uʔtxʷ]	*bathroom* (cf. waʔč *bowel movement*)
g. qaʔay=aw̓txʷ	[qáʔqᵊyɛ̀w̓txʷ]	*log cabin* (cf. qáʔqeʔ *small cut logs*)
h. k̓ʷuʔuxʷ=aw̓txʷ	[k̓ʷúʔuxʷàw̓txʷ]	*smoke house* (cf. [k̓ʷúʔʊxʷ] *smoked fish*)
i. IMP-qs-im+[ʔ]=aw̓txʷ	[qʌ́qseʔmàw̓txʷ]	*gym* (cf. qáqsem *to play*)
j. CəC$_{PL}$-tm̓=aw̓txʷ	[tə́mtamàwtxʷ]	*jail* (cf. tm̓ [tʌm̓] *tie up*)
j'. RED-tm̓=aw̓txʷ	[tə́mtəmʔàʔwtxʷ]	*jail* (cf. titm-it [tɛ́tmɛ̀t] *tied, bound up*)
k. ʔax̌iθ=aw̓txʷ	[ʔáx̌ɛθʌ̀w̓txʷ]	*bedroom, hotelroom* (cf. ʔax̌iθ *lay down*)
l. t̓ᶿiθuǰus=aw̓txʷ	[t̓ᶿíθoǰosàw̓txʷ]	*mental institution* (t̓ᶿáyθɔ̀ǰus *mentally ill*)
m. p̓akʷit=aw̓txʷ	[p̓ákʷitàw̓txʷ]	*floating house* (cf. p̓á:kʷɩt *raft*)

House, foundation, people:	=mixʷ[17]	**Indep. form:**
(53)		
a. t̓iy=mixʷ	[t̓íymʊxʷ]	*medicine*
b. q̓aʔq̓a=mixʷ	[q̓áʔq̓amɪxʷ]	*starving people* (cf. q̓aʔq̓a *hungry*)
c. hy=mixʷ	[híymɛxʷ]	*build a home*
c'. IMP-hy=mixʷ	[hʌ́hemɪxʷ]	*building a house*
d. hiy=mixʷ	[héymɪxʷ ~ hí:mɪxʷ]	*build a house, a home*

(54) **with LS =ay**	=ay=mixʷ	**Indep. form:** qaymixʷ [qáymɪxʷ] *person*
a. q̓at̓ᶿ=ay=mixʷ	[q̓áʔt̓ᶿaymixʷ]	*gathering of people (maybe: q̓ət̓ᶿ-)*
b. tač=ay=mixʷ	[táčaymɪxʷ]	*all our own people* (cf. tač-)
c. nac̓=ay=mixʷ	[nác̓aymɪxʷ]	*stranger (people from elsewhere)*
d. nukʷ=ay=mixʷ	[nókʷaymɪxʷ]	*population of village*

(55) **with -'Vg Plural**	='Vg=mixʷ	
a. q̓at̓ᶿ-'Vg=mixʷ	[q̓át̓ᶿʌwᵊmɪ̀xʷ]	*gathering different peoples* (q̓at̓ᶿ-aw *gather them*)
b. nac̓-'Vg=mixʷ	[nác̓ʌwmɪxʷ]	*stranger* (cf. nac̓ *different*)
c. ʔawk̓ʷ-'Vg=mixʷ	[ʔʌ́wk̓ʷawmɪxʷ]	all nationalities (cf. ʔawk̓ʷ- *variety*)

Instrument:	=min	
(56)		

[17] There are some instances of surface [mixʷ ~ èʔmixʷ] which although they appear to contain the LS=mixʷ may arise from a different source, namely the stative middle suffix -[i]m followed by the -(ʔ)Vg plural affix. For example, the word which means 'they're laughing' is [qʌ́sqəsèʔmixʷ] may come from /RED$_{PL}$-qs-[i]m-ʔVg/ ≫ qəs-qəs-im̓-ig. Recall that g becomes xʷ in word-final position, as shown by the alterations in §x.x. The presence of the glottal stop in [qʌ́sqəsèʔmixʷ] suggests this analysis rather than */RED$_{PL}$-qs=ay=mixʷ/. This lexical suffix and related forms require additional research.

a. xʷip-ʔm=min	[xʷípʔàmɛn ~ -mɩn]	*duster, small brush*
b. ɬič̓-ʔm=min	[ɬí·č̓ɛmɛn]	*comb*
c. pus-ʔm=min	[púsʔʌmɛn ~ -mɩn]	*baking powder*
d. t̓uɬ-ʔm=min	[t̓óɬʔʌmɛn]	*counter* (counter top)
e. t̓ᶿux̌ʷ-am-ʔm=min	[t̓ᶿúx̌ʷamʔʌ̀mɩn]	*dish pan* (aluminum)
f. θuɬ=min	[θóɬmɛn]	*Indian paint*
g. nam-ʔm=min	[námʔʌmɛn]	*pencil*
h. nam=us-ʔm=min	[námosʔʌ̀mɛn]	*camera*
i. tč̓-ʔm=min	[tíč̓ʔʌmɛn]	*square stretcher for deer hide*
j. tg̓-ʔm=min	[túʔʌmɛn]	*freezer* (cf. təẁ ~ tuʔ *ice*)
k. DIM-č̓x̌-ʔm=min+[ʔ]	[č̓ɛ́č̓x̌aʔmɛn]	*microwave oven*
k'. č̓x̌-ʔm=min	[č̓ʌ́x̌ʔamɛn]	*microwave oven*
l. q̓t̓-m-ʔm=min	[q̓ʌt̓maʔʌ̀mɩn]	*sinker (fishing line) (*q̓t̓-m [q̓áʔt̓əm] *heavy)*
m. θč̓-ʔm=min	[θíč̓ʔʌmɛn]	*chisel*
n. θh-ʔm=min	[θʌ́hʔʌmɛn]	*centre pole* (for tent) (θh-t [θaht] *prop s.t. up*)
o. ɬt̓-ʔm=min	[ɬáʔt̓ʌmɛn]	*herring rake*
p. hw-ʔm=min	[hʌ́wʔomɩn]	*kettle* (thing heat water in)
q. gt̓ᶿ-ʔm=min	[gʌ́t̓ᶿʔàmɩn]	*ax (for splitting wood)*
r. np-ʔm=min	[nə́pʔamɛn]	*container:basket, suitcase, bucket, envelope*
s. č̓tq-ʔm=min	[č̓ítqàmɛn ~ -mɩn]	*knife*
t. t̓ᶿwk̓ʷ-ʔm=min	[t̓ᶿú:k̓ʷaʔʌ̀mɛn]	*dipper* (for water)
u. DIM-msiqʷ-ʔm=min	[mɛ́msèqʷʌmɛ̀n]	*pins* (məsiqʷ [mʌsɛqʷ] *purple sea urchin*)

Instrument: =tn

(57) check all for [tn̩]

a. kʷixʷ=aǰis=tn kʷiw-ʔ	[kʷiwaʔǰɛ́stən]	*rouge*
a'. kʷixʷ=uθin=tn	[kʷixʷoθɛ́tən]	*lip stick*
b. θiy=nač=tn	[θéynʌčtən]	*saucer* (old word)

c. θiy=umixʷ=tn [θéyomɩxʷtən] *floor*

d. θiw=uθin=tn [θéwʊθètən] *table*

e. xʷip=umixʷ=tn [xʷípomɩxʷtən] *broom* (cf. xʷip- *sweep*)

f. xʷit̓ᶿ=tn [xʷít̓ᶿtən] *swing for a baby*
(cf. xʷít̓ᶿέθot *a spring in one's step*)

g. puq̓ʷ=us=tn [pú:q̓ʷostən] *face powder*

h. tap=tn [táptn̩] *corset* (with garter for stockings) (tap- *tight*)

i. q̓at̓ᶿ=tn [q̓át̓ᶿtən]~[q̓át̓ᶿtn̩] *hair grease, hair oil*

j. θap=tn [θáptɩn] *bath tub*

k. t̓ᶿm=tn [t̓ᶿə́mtən] *breast*

l. č̓ʔ=uθin=tn [č̓óʔoθètən] *table cloth* (cf. č̓ʔ- *on top of*)

m. ɬθ=tn [ɬʌ́θtən] *perfume*

n. šm̓-ay=it̓ᶿa=tn [šέʔmay̓it̓ᶿatən] *clothes dryer* (šm̓ [šəm̓] *dry*)

o. ǰk̓ʷ=iqʷ=uǰa=tn [ǰὲʔkʷeqʷóʔǰεtən] *nail polish* (cf. ǰək̓ʷ *rub, paint*)

p. np=nač=tn [nə́pnačtən] *saucer* (for tea cup)(nəp- *inside, under*)

Instrument: =ayu

(58)

a. q̓n=ayu [q̓ʌ́nayu] *needle (for sewing)*

Intestine, abdomen, stomach, sack: =ƛ̓ač

(59)

a. ɬik̓ʷ=ƛ̓ač [ɬík̓ʷƛ̓ač] *gunny sack* (cf. ɬik̓ʷ *sew*)

b. kʷup=ƛ̓ač [kʷú·pƛ̓əčʰ] *Hernando Island* (cf. kʷup- *hill*)

c. say=ƛ̓ač-m [sáyƛ̓ačɩm] *diarrhea* (say- *whole?*)

d. qayx̌a=ƛ̓ač [qáyx̌aƛ̓ač] *kidney* (internal body part)

e. px̌=ƛ̓ač [pə́x̌ƛ̓ač] *to break open, explode* (cf. px̌ *break open*)

f. qk̓ʷ=ƛ̓ač=tn [qʌ́k̓ʷƛ̓æ̀čtən] *apron, dancer's/ kitchen apron* (qk̓ʷ *cover*)

g. q̓s=ƛ̓ač	[q̓ʌ́sƛ̓æč]	*laughed so hard* (cf. q̓s *tired*)
h. qʷs=ƛ̓ač	[qʷʌ́sƛ̓ač]	*human liver*
i. np=ƛ̓ač	[nə́pƛ̓ač]	*fish, deer guts* (cf. np- *inside*)

Intestine, stomach: =ayč̓

(60)

a. ʔh=ayč̓	[ʔáhʌyč̓]	*upset stomach* (cf. /ʔh/ ʔah *sore*)
b. ɬx̌=ayč̓+[i]	[ɬʌ́x̌ayič̓]	*not felling well* (cf. /ɬx̌/ ɬʌ́x̌ *bad*)
c. ɬx̌=ayč̓-in	[ɬʌ́x̌ayč̓ɩn]	*hair standing on end*

Knee: =iqʷɬa **Indep. form:** qʷn̓=iqʷɬa [qʷáʔnʊqʷɬa] *knee*

(61)

a. č̓q̓ʷ=iqʷɬa-ʔm	[č̓ɛ́ʔᵊq̓ʷɛqʷɬàʔʌm]	*to kneel down*
a'. IMP-č̓q̓ʷ=iqʷɬa-ʔm č	[č̓ɩ́č̓q̓ʷɛqʷɬæ̀ʔʌmčʰ]	*I'm kneeling down*
b. RED-tm̓=iqʷɬa=tn	[tə́mtaʔmèqʷɬatn̩]	*rag tied around knees* (cf. təm̓ *belt, tie*)

Leaf, stalk, root (of plant) foliage: =aǰ̓a **Indep. form:** ǰaǰ̓a [ǰɛ́ʔǰɛ] *tree* ; [sáy̓ǰɛ] *leaf*

(62)

a. ƛ̓ip=aǰ̓a	[ƛ̓ɛ́paʔǰɛ]	*under brush*
b. DIM-tul=aǰ̓a+[ʔ]	[tótəlàʔǰɛʔ]	*small root*
c. t̓uqʷəm=aǰ̓a	[t̓óqʷəmàʔǰɛ]	*thimble berry leaves* (t̓uqʷəm *thimble berry*)
d. x̌ʷus-m=aǰ̓a	[x̌ʷósɔmʔàǰɛ]	*soapberry leaves* (x̌ʷus-um *soapberry*)
e. paL'=aǰ̓a	[páʔaʔǰɛ]	*edible stalk* [18]
f. x̌aʔ=aǰ̓a	[x̌áʔaʔǰɛ]	*bog cranberry bush* (cf. x̌aʔ *bog cranberry*)

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[18] These are the edible stalks from the salmonberry and thimbleberry bushes. MG recommended picking the new shoots which are nearest to the ground. The skin is peeled off before eating. These are the first tender young shoots of the year, and maybe reflected in the morphological composition of this word: /paL'/ paʔa 'one', perhaps 'first=stalk; first=growth'.

g. yam̓aǰ=aǰ̓a	[yέʔmaǰὲʔǰε]	*knot* (on a tree)
h. ƛ̓q=aǰ̓a	[ƛ̓ʌ́qaʔǰε ~ ƛ̓ʌ́qʔàʔǰε]	*bloom, when buds are coming on bushes*

Lid (lid for a basket, pot): =ipan , =iʔpan **Indep. form:** kʷn̓ay [kʷáʔnʌy] *cover, lid*

(63)

a. gq̓=ipan	[gʌ́ʔq̓εːpʌn]	*it has no lid* (cf. /gq̓/ gəq̓ *open*)
b. pus=iʔpan	[púseʔᵊpʌn]	*basket lid*

Mattress: -aʔaɬ , =aɬaɬ , -aʔaɬaɬ **Indep. form:** qáʔqa *mat, mattress for sleeping on*

(64) **Indep. form:** ƚ̓uɬaɬ [ƚ̓óɬʌɬ] *bed*

a. t̓ᶿut̓ᶿuq̓ʷ-aʔ=aɬ	[t̓ᶿót̓ᶿoq̓ʷaʔᵃɬ]	*feather mattress*
a'. CəCPL-t̓ᶿut̓ᶿuq̓ʷ-aʔ=aɬaɬ	[t̓ᶿə́t̓ᶿt̓ᶿoq̓ʷaʔaɬʌɬ]	*lots of feather mattresses* (~ [t̓ᶿít̓ᶿ-])
b. ƛqm=aɬaɬ	[ƛʌ́qəmàɬæɬ]	*thin (grass) mattress*
c.		

Mouth (outside), lips: =uθin , =uθin (stative) **Indep. form:** θuθin [θó·θɩn ~ θó·θεn] *mouth*

(65)

a. tih=uθin	[tí·hoθεn]	*big mouth*
b. ƛ̓ip=uθin	[ƛ̓έpoθɩn]	*lower lip*
c. DIM-qʷup=uθin	[qʷóqʷpòθɩn]	*grey cod* (lit: whiskers on face)
c'. qʷup=uθin	[qʷópoθɩn]	*hair on lip*
d. huǰ=uθin	[hóǰoθɩn]	*finish eating*
d'. huǰ=uθin+Stv	[hóǰoθὲn]	*be finished eating*
e. q̓ʷayč̓=uθin	[q̓ʷáyč̓o·θεn]	*razor clam*
f. ɬaʔqʷ=uθin-m	[ɬǽʔqʷoθὲnəm]	*lick one's lips*
g. ʔaxʷǰ=uθin	[ʔáxʷᵊǰoθɩn]	*can't finish what's on your plate*
h. tqʷ=uθin	[tʌ́qʷoθεn ~ -oθɩn]	*fish trap (on river)*
i. k̓ʷš=uθin-m	[k̓ʷʊ́šoθὲnəm]	*to tell a joke* (cf. k̓ʷəš-)

i'. k̓ʷš=uθin-m [k̓ʷɪ́šoθènəm] *to tell a joke*

j. IMP-qs-m=uθin-m+[ʔ] [qáqsaʔmoθèʔnəm] *singing (know words and song)*

k. sp̓=uθin [sáʔᵊp̓òθɩn] *get hit on the mouth*

k'. sp̓=uθin-'uɬ č [sáʔᵊp̓o:θèʔnoɬčʰ] *I got hit on the mouth*

l. šʔt=uθin [šáʔtòθɛn] *upper lip*

This LS also has the allomorph [=uθ] which occurs in a number of lexical items:

(66)

a. RED-ʔəǰ̓=uθ-m [ʔáyʔaʔǰ̓ùθəm] *Sliammon language; speak well*

Mouth (inside), language, voice: =qin **Indep. form:** sayqin [sʌ́yqən] *mouth*

(67)

a. t̓ig=qin=tn [t̓ɪ́kqetən] *any sweet, dessert* (cf. t̓ig *sweet*)

b. ƛ̓iš=qin [ƛ̓ɪ́šqɛn] *saliva* (cf. ƛ̓ášƛ̓išəm *slimy*)

b'. ƛ̓iš=qin-m [ƛ̓ɪ́šqɛnəm] *to drool*

c. miǰaθ=qin [méǰaθqɛn] *flesh inside mouth* (cf. miǰaθ *flesh*)

d. tuʔq=qin [tóʔqʰqɛn] *Squirrel Cove language*

e. ƛ̓uq̓ʷ=qin [ƛ̓óq̓ʷqɛ̀n] *hard to understand* (ƛ̓uq̓ʷ *hard to find*)

f. qʷum=qin-t [qʷómqɛtʰ] *to kiss him/her*

g. ʔuʔp=qin [ʔóʔpʰqɛn] *Homalco language* (local variety)

h. ɬaʔamin=qin [ɬáʔamɩnqɛn] *Sliammon language* (local variety)

i. qaymixʷ=qin [qáymɩxʷqɛn] *Indian language*

i'. RED-qaymixʷ=qin-m [qə́yqʌymɩxʷqɛ̀nəm] *speaking Indian* (cf. qaymixʷ *FN person*)

j. q̓aykʷ=qin [q̓áykʷqɛn] *eagle's call* (cf. q̓aykʷ *bald-headed eagle*)

k. tg=qin [túwqɛn] ~ [tʊ́wqɛn] *to answer back*

k'. IMP-tg=qin+[ʔ] [tə́tᵊgaqɛn̓] *answering back*

l. šʔ=qin [19] [šáʔqɛn] *turn it right-side up* (cf. šʔ *high, upwards*)

l'. šʔ-t=qin [šáʔtqɛn ~ šɛ́ʔtqɛn] *roof of mouth*

Neck (see also: Ear): =an̓a **Indep. form:** sayan̓a [sáyɛʔna] *neck*

(68)

a. t̓ᶿiyč̓=an̓a [t̓ᶿíyč̓ɛ̀ʔnʌ] *twisted neck*

b. pus=an̓a [pú:saʔna] *lump on neck*

c. say=an̓a [20] [sáyɛʔna] *neck*

d. ƛ̓ay=an̓a [ƛ̓áyɛʔna] *handles* (on purse, basket)

e. x̌q̓=an̓a [x̌áʔq̓aʔnʌ] *whirl pool*

e'. CəC$_{PL}$-x̌q̓=an̓a [x̌ʌ́q̓x̌aʔq̓àʔnʌ] *huge whirl pool; place name* [21]

f. ƛpxʷ=an̓a [ƛʌ́pxʷaʔᵊna] *break one's neck*

Net , fishing net: =ǰan **Indep. form:**

(69)

a. ɬik̓ʷ=ǰan [ɬík̓ʷǰɛn ~ ɬík̓ʷᵊǰɛn] *to repair a fishing net*

Nose (non-productive): =qsn [=əqsən] **Indep.form:** mqsn [mʌ́qsɩn] *nose*

(70)

a. IMP-ʔǰ=qsn-ʔəm č [ʔáʔᵊǰɛ̀qsənʔə̀mčʰ] *I sneezed real good*

b. ʔg̓=qsn [ʔáʔgɛqsɩn] *Harwood Island*

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[19] This word means to 'turn s.t. (e.g. a boat) so that the open part is facing the sky'.

[20] The root say- 'whole, entire' occurs frequently as in sáyɬaɬ 'throat', say-mut as in sáymut č̓íɬ 'it's pouring, raining very hard'.

[21] One consultant gave this form as the name for Surge Narrows; another consultant said that Surge Narrows is called [t̓at̓pəʔos]. This needs to be checked further.

Nose, elongated object (productive): =iqʷ **Indep. form:** /m̓qsn/ mʌ́qsən *nose*

(71)

a. k̓ilθ=iqʷ	[k̓ílθɛqʷ ~ k̓ílθeqʷ]	*crooked nose* (cf. k̓il[i]θ *crooked*)
b. t̓l̓k̓=iqʷ	[t̓ʌ́lk̓ɛqʷ]	*nostril*
c. tih=iqʷ	[tí·hɛqʷ]	*big nose*
d. t̓š=iqʷ	[t̓íšəqʷ]	*snot, nasal mucus*
e. ƛ̓aqt=iqʷ	[ƛ̓áqtɛqʷ]	*long beak*

People: =ayi

The following forms were systematically elicited from one speaker with the LS =ayi rather than the form =aya cited in (74)below.

(73)

a. mus=ay-i	[mósayi]	*four people*
b. θiyačis=ay-i	[θíyɛčsàyi]	*five people*
c. t̓x̌əm=ay-i	[t̓ʌ́x̌əmàyi]	*six people*
d. t̓ᶿuʔčis=ay-i	[t̓ᶿóʔčisàyi]	*seven people*
e. taʔačis=ay-i	[táʔači:sàyi]	*eight people*
f. tigixʷ=ay-i	[tígixʷɔ̀yi]	*nine people*
g. ʔupan=ay-i	[ʔó:pʌnàyi]	*ten people*

Person: =aya ~ =ayaʔ (Stv.) **Indep. form:** qaymixʷ *person*

(74)

a. mus=aya [22]	[mósayɛ]	*four people*
b. θiyačis=aya	[θíyɛčsàyɛ]	*five people*
c. t̓x̌əm=aya	[t̓ʌ́x̌əmàyɛ]	*six people*

[22] The forms for 1-3 people are as follows: [pí:payɛ] ~ [pé:paʔa] 'one person', [sɛ́saʔa] 'two people', [čɛ́:ɬayi] 'three people'.

d.	t̓ᶿuʔčis=aya	[t̓ᶿóʔčis:àyɛ]	*seven people*
e.	taʔačis=aya	[táʔačis:àyɛ]	*eight people*
f.	tigixʷ=aya	[tígixʷɔ̀yɛ]	*nine people*
g.	ʔupan=aya	[ʔó:pʌnàyɛ]	*ten people*
h.	DIM-mus+[ʔ]=aya PL-čuy̓	[móʔmsayɛ číčuy̓]	*four little kids*
i.	DIM-t̓x̌əm=aya PL-čuy̓	[t̓ét̓x̌ʌmàyɛ číčuy̓]	*six little kids*
j.	DIM-ʔupan+[ʔ] PL-čuy̓	[ʔó:ʔəpʌn̓ číčuy̓]	*ten little kids*
k.	qx̌=ayaʔ Stv.	[qə́x̌hayɛʔ]	*a lot of people* (cf. qəx̌ *many*)

Person, child: =ay **Indep. form:** qaymixʷ [qáymɩxʷ] *person*

(75)

a.	ƛ̓ax̌=ay	[ƛ̓áx̌ʌy]	*elder* (cf. ƛ̓ax̌ *old*)
a'.	DIM-ƛ̓ax̌=ay+[ʔ]	[ƛ̓áƛ̓x̌ʌy̓]	*elder*
b.	ƛ̓uɬ=ay-m	[ƛ̓óɬayɩm̓]	*to raise a child*
c.	IMP-mn̓a=ay-t	[mə́mnaʔeʸt]	*having a baby*

Consider the additional data which are words for living creatures which also end in =ay , a form of the lexical suffix for *person*.

(76) **Animate, life form, person:** =ay **Gloss**

a.	t̓ip=ay	[t̓ɛ́pay]	*barbecue meat* (Kl)
b.	ʔilq̓=ay	[ʔɛ́lq̓ʌy]	*barbecued deer meat*
c.	ʔuɬq=ay	[ʔóɬqʌy]	*snake*
d.	p̓g=ay̓	[p̓ʌ́gʌy̓]	*halibut*
e.	p̓g̓=ay	[p̓áʔgʌy]	*flounder*
f.	ƛ̓x̌ʷ=ay	[ƛ̓ɔ́x̌ʷʌy]	*chum, dog salmon*
g.	θq̓=ay	[θʌ́q̓ʌy]	*sockeye salmon*
h.	x̌ʷiƛ̓=ay	[x̌ʷɛ́ƛ̓ʌy]	*mountain goat*

i. mt̓=ay [máʔt̓ʌy] *horse clam, geoduck*

We might ask why words like *barbecued meat, mountain goat* and *horse clam* would containt the same LS which is also used to mean *person*? I believe that an explanation can be found in the traditional oral teachings <xwáxwa7jím̓> [xʷáxʷaʔǰèm̓] of the Homalco, Klahoose, and Sliammon people, as documented by Kennedy and Bouchard (1983:95):

> *These [xʷáxʷaʔǰèm̓] of the Sliammon tell of events that took place in the beginning of time, during what we might call the "Mythological Age." In the Mythological Age, things were not as they are today. The world was in a state of disorder and uninhabitable for the present-day Indian people. **Beings who resembled humans, but who had animal spirits and the names of what came to be animals, roamed the land**. Cannibalistic monsters and even mountains and winds preyed on the unsuspecting, until at last **the animal-people** tamed them and transformed the world into a safe place. Because of the activities of **the animal-people**, both animals and humans came to have certain characteristics. .... The Sliammon people consider these accounts of the Mythological Age to be true, for the existence of the world, as it is, is proof* [emphasis mine].

Place, container, basket: =aya, =ayaʔ **Indep. form:** pəču [pɩču] *basket*

(77)

a. x̌ʷax̌ʷit=aya	[x̌áx̌etàyi]	*egg carton* (cf. x̌ʷáʔx̌ʷɛt *egg*)
b. ʔiʔagik̓ʷ=aya	[ʔéʔagik̓ʷàyɛ]	*clothes basket* (cf. ʔiʔagik̓ʷ *clothes*)
c. p̓q̓=aya	[p̓áʔq̓àyɩ]	*chimney, stove pipe* (cf. p̓əq̓ *smoke*)
d. waʔč=aya	[wáʔčeyɛ]	*anus* (cf. waʔč *bowel movement*)
e. qawθ=aya	[qáwθàyɛ]	*sack of potatoes* (cf. qawθ *potato*)
f. ʔapls=aya	[ʔáplɩsàyi]	*box of apples* (cf. ʔápl̩s *apple*)
g. ʔayaxʷ=aya	[ʔáyɛxʷʌyɛ]	*berry-picking basket*

g'. ʔayxʷ=aya	[ʔáyuxʷʌyɛ]	*berry-picking basket*
h. x̣̌aɬm=aya	[x̣̌áɬəmàyɛ]	*salt shaker* (cf. [x̣̌áɬəm] *salt*)
i. qʷasam=aya	[qʷásʌmàyɛ(ʔ)]	*flower pot, vase* (cf. qʷasam *flower*)
j. xʷuǰ-um=aya	[xʷúǰu·màyɛ]	*store* (cf. x̌uǰ-ʊm *sell*)
k. kʷan=nač-m=aya	[kʷán·ačmàyɛ]	*backsides (place where you sit)* (kʷan- *rest*)
l. ngin=aya	[nɩ́ginayɛ]	*lunch basket* (cf. nə́gin *bag lunch, lunch*)
m. ʔƛ̓-ʔm=min=aya	[ʔʌ́ƛ̓amenàyɛ]	*garbage can, pail* (cf. ʔə́ƛ̓-əm *garbage*)
n. qms-ʔm-min=aya	[qʌ́msàʔᵊmɛnàyɛ]	*cupboard* (cf. qəms- *get stored*)
o. c̓š-m=igan=tn=aya	[c̓ɩ́šəmègatɩnàye]	*milk jug* (cf. c̓əš- *mucus*)
p. ti=aya	[tíhayɛ]	*tea, cup of tea, teapot*
q. kapi=aya	[kʸápihàyɛ]	*coffee pot* (cf. kapi *coffee*)
r. wax̌at̓ᶿi=aya	[wáx̌at̓ᶿɛhàyɛ]	*pipe case* (smoking) (cf. wáx̌at̓ᶿi *pipe*)
s. q̓nayu=aya	[q̓ʌ́nayohàyɛ]	*needle case* (sewing) (cf. q̓ə́n=ayu *needle*)
t. mak̓ʷa=aya	[mák̓ʷahàyɛ]	*coffin* (cf. mak̓ʷa *corpse*)
t'. mak̓ʷa=ayaʔ	[mák̓ʷaʔàyɛʔ]	*graveyard* (cf. mak̓ʷa *corpse*)
u. ƛ̓in̓a=aya	[ƛ̓ɛ́ʔnahàyɛ]	*oolichan oil container* (ƛ̓ɛ́ʔna *oolichan oil*)
v. tala=aya	[táləhàyɛ]	*purse* (cf. tala *money*)
w. t̓ᶿy̓a=aya	[t̓ᶿáʔyɛhàyɛ]	*refrigerator, storage box* (t̓ᶿáʔyɛ *food stores*)
x. šukʷa=aya	[šúkʷahàyɛ]	*sugar bowl* (cf. šúkʷa *sugar*)
y. pəpa=aya	[pə́pʌhàyɛ]	*pepper mill, shaker* (cf. pə́pʌ *pepper*)

There is at least one word which may have an l-variant of this lexical suffix =ala

(78)

a. hnk=ala	[hə́nkɛla ~ hə́nkàla]	*pot one cooks in*

Rock: =ays **Indep. form:** x̌aǰ̓is [x̌áʔǰis] *rock*

(79)

a. kʷθ=ays	[kʷʊ́θʌys]	*island*
b. DIM-θax̌=ays+[ʔ]	[θáθx̌àẏs]	*pebbles*

Roof (see also house, building): =txʷ

(80)

a. saɬ=txʷ	[sáɬtxʷ]	*woman*
b. IMP-ʔuɬ=txʷ+[ʔ]	[ʔóʔoɬtxʷ]	*coming in*
c. ʔiy=txʷ	[ʔéyˡtxʷ]	*roof (of a building)*

Roots (cedar, spruce, root of tree), rope: =kʷum [23] **Indep. form:** kʷm̓=nač [kʷáʔʌmnač] *root*

(81)

a. tituľ=kʷum	tí:tɔlkʷùm ~ títolkʷùm	*small roots, thin rope*
b. saL’=kʷum	sáw̓kʷum	*two roots*
c. pɬ=kʷum	pʌ́ɬkʷùm	*thick rope*
d. tih=kʷum	tíhkʷum	*big (thick) rope*
e. kʷɬ=kʷum-t	kʷʊ́ɬkʷumt	*untangle s.t.* (roots, wool)

Sentiments, spirit, inner part, inside (body), side of body, size: =igan

(82)

a. t̓ᶿik̓ʷ-t=igan	[t̓ᶿɛ́k̓ʷtègʌn]	*left-side of body*
b. tič=igan č	[tíčigʌnčʰ]	*I'm disappointed* (cf. tiyč- / təyč- *miss*)
b'. tič=igan-ng-mš-as	[tíčigʌ̀n:omš̓ɩs]	*he disappointed me*
c. q̓ix̌=igan-ʔm	[q̓éx̌egʌnʔəm]	*cheat*
d. IMP-qix̌=igan-m+[ʔ]	[qɛ́qəx̌ègaʔᵊnòm]	*he's telling lies*
e. λ̓ašt=igan-m+[i]	[λ̓áštegànɩm]	*feeling anxious, worried, uneasy*
f. λ̓ax̌=igan	[λ̓áx̌egʌn]	*wise (person)* (cf. λ̓ax̌ *old*)

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[23]There is also an independent bound root kʷum- which means *reddish, pinkish, flushed.*

g.	qʷay=igan	[qʷáyegən]	*think about it* ("inner voice" cf. qʷay *talk*)
h.	IMP-qʷay=igan	[qʷáqʷayegan]	*talking to oneself*
i.	ʔayʔ=igan-s	[ʔáyʔi:gʌns]	*inner part of cedar tree*
j.	IMP-pʔ=igan+[ʔ]	[pə́pʔɛʔgʌn]	*pregnant*
k.	t̓š-am=igan=tn	[t̓ɩ́šəmègatɩn]	*milk* (cf. t̓ɩš *mucus*)
l.	DIM-č̓ƛ̓=igan	[č̓íč̓aʔƛ̓ègʌn ~ . č̓ɛʔ .]	*short person, shorty* (root: č̓ƛ̓ / č̓iƛ̓)
m.	k̓ʷn=ay=igan-ʔm+[i]	[k̓ʷʊ́nay̓iganʔɛ̀m]	*spiritual person, psychic* (cf. k̓ʷən *see*)
n.	šʔ-t qʷay=igan	[šɛ́ʔtʰ qʷáyigʌn]	*proud, high minded*
o.	x̌ʷƛ̓=igan	[x̌ʷáʔƛ̓egən]	*half full*
p.	hw=igan	[hʌ́whegʌn]	*silly, off beat*
q.	IMP-ʔh-ay=igan=us	[ʔáʔhay̓iganos]	*scary face* (cf. ʔh [ʔah] *hurt, sore*)
r.	ʔǰ-am-t=igan	[ʔáʔǰɛmtègʌn]	*right-side of body*
s.	ny=igan [24]	[níyegən]	*to calm down, cool off* (cf. ny *forget*)
s'.	IMP-ny=igan	[nə́nyigʌn]	*forgetting*
t.	x̌mǰ=igan	[x̌ʌ́mǰ̓igʌn]	*want what you can't have, covet (s.t.)*

Shoulder: =am-čis, =aʔàmčis, =aʔamč̓is (stv.)

(83)

Side (of body): =wum , =wum̓ (stv.)

(84)

a.	taʔt=wum	[táʔtwʊm]	*side of the body* (cf. tat ~ taʔt *side*)

Smell, odour: =aqap Indep. form:

(85)

a.	ɬx̌=aqap	[ɬʌ́x̌:aqʌp]	*bad smell*

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[24]This means 'to calm down or cool off after having been mad about something'.

Tens (in counting): =šáʔ **Indep. form:** ʔupan [ʔópʌn] *ten*

(86)

a. θam=šaʔ	[θʌ́mšɛʔ]	*twenty*
b. čanəxʷ=šaʔ	[čɛ́nʊxʷšɛ́ʔ]	*thirty*
c. mus=aɬ=šaʔ	[mósʌɬšɛ́ʔ]	*forty* (mós *four*)
d. θiyačis=aɬ=šaʔ	[θíyɛčɩsʌɬšɛ́ʔ]	*fifty* (θíyɛčɩs *five*)
e. t̓x̌əm=aɬ=šaʔ	[t̓ʌ́x̌əməɬšɛ́ʔ]	*sixty* (tə́x̌əm *six*)
f. t̓ᶿuʔčis=aɬ=šaʔ	[t̓ᶿóʔčisəɬšɛ́ʔ]	*seventy* (t̓ᶿóʔčis *seven*)
g. taʔačis=aɬ=šaʔ	[táʔačisəɬšɛ́ʔ]	*eighty* (táʔačis *eight*)
h. tigixʷ=aɬ=šaʔ	[tɩ́gʸixʷəɬšɛ́ʔ]	*ninety* (tígixʷ *nine*)

Thigh: =anaq **Indep. form:**

(87)

a. RED-say=anaq	[sísayɛnʌq]	*groin, crease, area between legs*

Throat: =qaƛ̕-ay , =qƛ̕ay

(88)

a. tm̓=qƛ̕ay=tn	[tʌ́mqƛ̕aytɩn]	*rag tied around neck* (təm̓ *to tie, belt*)

Throat: =ɬaɬ **Indep. form:** sayɬaɬ [sáyɬaɬ] *throat*

(89)

a. DIM-tuq=ɬaɬ+[ʔ]	[tótqɬaɬ ~ tótqʷɬaɬ]	*necklace* check: tutq[ə]ɬaɬ
a'. DIM-tux̌ʷ=ɬaɬ	[tótx̌ʷɬaɬ]	*necklace*
b. x̌ʷum=ɬaɬ	[x̌ʷómɬaɬ]	*windpipe*
c. pus=ɬaɬ	[púsɬaɬ ~ púsɬəɬ]	*Adam's apple, glottis* (cf. pus- *lump*)
d. ɬak̓ʷ=ɬaɬ	[ɬák̓ʷɬaɬ]	*mumps, throat swells* (cf. ɬak̓ʷ *swell up*)
e. ʔj̓=ɬaɬ-mut	[ʔí:ɬàɬmotʰ]	*really enjoy what is eaten*

f. np=ɬaɬ	[nə́pɬaɬ]	*got s.t. in throat* (cf. nəp- *inside*)

Throat: =awt̓ᶿ , =ag[i]t̓ᶿ(stv.) **Indep. form:** q̓áʔut̓ᶿ *uvula, glutton*

(90)

a. q̓aʔ=agt̓ᶿ	[q̓áʔʌwt̓ᶿ]	*glutton, eat lots*
b. tq̓=agt̓ᶿ	[tʌ́q̓ʌwt̓ᶿ]	*choke*
c. ɬx̌=agt̓ᶿ	[ɬʌ́x̌awt̓ᶿ]	*sore throat*

Times, number of times: =aɬ

(91)

a. mus=aɬ	[mó:saɬ]	*four times* [25]
a'. mus	[mós]	*four*
b. θiya=čs=aɬ	[θíyɛčsàɬ]	*five times*
b. θiya=čis	[θíyɛčɩs]	*five*
c. t̓əx̌əm=aɬ	[t̓ʌ́x̌ʌmaɬ]	*six times*
c'. t̓x̌m	[t̓ʌ́x̌əm]	*six*
d. t̓ᶿuʔ=čis=aɬ	[t̓ᶿóʔči:sàɬ]	*seven times*
d'. t̓ᶿuʔ=čis	[t̓ᶿóʔčɩs]	*seven*
e. taʔa=čis=aɬ	[táʔači:sàɬ]	*eight times*
e'. taʔa=čis	[táʔačɩs]	*eight*
f. tigixʷ=aɬ	[tígʸi:xʷʌɬ]	*nine times*
f'. tigəxʷ	[tígʊxʷ]	*nine*
g. ʔupan=aɬ	[ʔó:pà:nʌɬ]	*ten times*
g'. ʔupan	[ʔopʌn]	*ten*
h. ʔupan=aɬ hikʷ paL'	[ʔó:pʌnəɬ hekʷ páʔa]	*eleven times*

[25] The numbers 1-3 times are irregular: [načɛxʷ] 'once', [θá:ma] 'twice' and [čɛ́nəxʷ] 'three times', although one speaker also produced [páʔaʔaɬ] for 'once'.

Toe: =aw̓u=šən, =aw̓u=š̓in̓ **Indep. form:** x̌aw̓=aw̓u=šn [x̌ʷáʔwawʊšɩn] *toe*

(92)

a. ɬap̓=aw̓u=šn	[ɬáp̓aʔᵊwʊ̀šɩn]	*to stumble, stub toe*
b. qap̓=awu=šin	[qáp̓awùšin]	*toe nail*
b'. qap̓=awu=šin=tn	[qáp̓awušitən]	*toe nail*
c. ƛ̓ax̌=aw̓u=šin	[ƛ̓áx̌aʔwʊšɩn] check	*big toe* (cf. ƛ̓ax̌ *old*)

Tongue: =ixʷθaɬ **Indep. form:** tixʷθaɬ [tíxʷθaɬ] *tongue*

(93)

a. tixʷθaɬ	[tíxʷθaɬ]	*tongue*

Tooth, cutting edge, protruberance: =unis, =nis Indep. form: y̌ínɩs *tooth*

(94)

a. RED-tih=unis	[títhonɩs ~ títhonɛs]	*big teeth*
b. ƛ̓ax̌aǰ=unis	[ƛ̓áx̌aǰùnɩs]	*wisdom teeth* (elder=teeth)
c. pq=unis	[pʌ́qʷonɩs]	*white teeth*
d. t̓ᶿx̌ʷ=unis-m	[t̓ᶿóx̌ʷonɛ̀səm]	*brush one's teeth*

Example with =nis:

(95)

a. ɬx̌=nis	[ɬʌ́x̌nɛs]	*dull, not sharp* (cf. ɬəx̌ [ɬʌx̌] *bad*)
b. ʔǰ̓=nis	[ʔí:nɛs]	*sharp* (object e.g. knife)

Tree, bush, wooden (productive LS): ='ay **Indep. form:** ǰaǰ̓a [ǰɛ́ʔǰɛ] *tree*

(96) **Obstruent final stem**

a. p̓iy̓x̌='ay / p̓əy̓x̌- ?	[p̓éy̓x̌ʌy]	*alder tree*
b. t̓ᶿiwq̓='ay	[t̓ᶿéwq̓ʷʔʌy]	*red elderberry bush* (t̓ᶿiwq̓ *red elderberry*)
c. t̓in̓iqʷ='ay	[t̓ɛ́ʔnɛqʷay ~ t̓éʔnɨqʷʌ̀y]	*salmonberry bush*
d. čilas='ay	[čílʌsʔʌy]	*cherry tree* [26]
e. t̓uʔxʷ='ay	[t̓óʔxʷʌy]	*Grand Fir* [27]
f. k̓ʷuɬ='ay	[k̓ʷóɬʔay]	*maple tree*
f'. DIM-k̓ʷuɬ='ay	[k̓ʷúk̓ʷɬay̓]	*small maple tree*
g. puqʷ='ay	[pɔ́qʷʌy ~ póq̓ʷʌy]	*rotten wood*
h. t̓q='ay	[t̓áqʔʌy ~ t̓áqʰᵊʔi]	*salal berry bush* (cf. t̓aqa *salal berry*)
i. t̓am̓əxʷ='ay	[t̓áʔmʊxʷay]	*gooseberry bush*
j. qʷaʔɬ='ay	[qʷáʔɬʌy̓]	*raspberry bush*
k. qʷanx̌='ay	[qʷánx̌ʌy]	*crabapple tree* (cf. qʷanx̌ *crabapple*)
l. mt̓ᶿ=əɬp='ay	[máʔt̓ᶿəɬpʌy]	*ocean spray, iron wood*
m. č̓t̓='ay	[č̓ɛ́ʔt̓ʌy]	*devil's club*
n. t̓ᶿč̓=əɬp='ay [28]	[t̓ᶿáʔᵊč̓ɩɬpʌy]	*Sitka spruce*
o. qʷɬ='ay	[qʷʊ́ɬʌy̓]	*driftwood* (cf. qʷɬ- *wash ashore*)
p. mθkʷ='ay	[mʌ́θkʷay ~mʌ́θkʷʌy̓]	*blackcap berry bush*

[26]This root appears to be borrowed from the English plural form 'cherries' [čɛ́riz] since the root in Sliammon has a final [s] (devoicing of z to s). This occurs in a number of other borrowings from English into Sliammon, such as [kiks] 'cake' from English 'cakes', [tʌks] 'duck' from English 'ducks', . This has been observed for a number of other Salish languages including Musqueam (hən̓q̓əmin̓əm̓) (Suttles), Island Halkomelem Gerdts (p.c.).

[27]The bark of the Grand Fir is very thick and expands when it is burnt. JM tells of a friend with a round tin heater who put too much Grand Fir bark into his heater -- the bark expanded and ruined the heater!

[28]This root for Sitka Spruce is clearly morphologically complex: /t̓ᶿč̓=əɬp=ay/. The first lexical suffix =əɬp appears to be related to =aɬp 'tree, bush, plant' found, for example, in Lillooet (Salish): van Eijk (1985: 102). Since the productive lexical suffix for 'tree' =ʔay is also added in the , I assume that =əɬp is lexicalized here.

(97) **Resonant final stem**

a.	hig̓an='ay	[hɛ́ʔgənʌy]	*strawberry plant*
b.	t̓uqʷ-m='ay	[t̓óqʷəmʔày]	*thimbleberry bush* (a.k.a. red caps)
c.	t̓ux̌ʷʔəm='ay	[t̓úxʷᵘʔa·ʔmʌy]	*huckleberry bush*
d.	RED-kʷum='ay	[kʷʊ́mkʷʊmʔay]	*arbutus tree* (kʷum- *red*)
e.	x̌ʷusum='ay	[x̌ʷósom̓ay]	*soapberry bush* (x̌ʷusum *soapberry*)
f.	p̓ay̓an='ay	[p̓áʔyɛ̀nʔʌy]	*douglas fir, fir tree*
g.	č̓ag='ay	[č̓áʔgʌy]	*wooden spoon* (cf. č̓ag- *help*)
h.	tx̌m='ay	[tʌ́x̌ʌmʔʌy]	*red cedar tree*
i.	t̓y̓m='ay	[t̓éy̓mʌy]	*wild cherry tree*
j.	čtuxʷan='ay	[čɪ́tuxʷʌnʔày]	*blackberry bush, canes*
k.	q̓g̓an='ay	[q̓áʔgɪnʔʌ̀y]	*rose bush*
l.	x̌ʷp̓an='ay	[x̌ʷáʔp̓ʌnʔʌ̀y]	*Labrador tea (bush)*

(98) **Laryngeal final stems**

a.	qʷuʔ='ay	[qʷó·ʔay ~ qʷó:ʔʌy]	*Hemlock (western)*
a'.	RED$_{Pl}$-qʷuʔ='ay	[qʷó:q̓ʷo:ʔʌy]	*lots of hemlock*
b.	x̌aʔ='ay	[x̌áʔay]	*bog cranberry*

(99) **Vowel final stem**

a.	ʔusa='ay	[ʔósaʔʌy ~ ʔósahʌý̓]	*high blueberry bush*
b.	qaʔqa='ay	[qáʔqaʔʌy]	*bulrush, cattail stalk* (for mattress making)
c.	ham̓u='ay	[háʔmohʌy] check	*cascara tree* (lit: pigeon=tree) [29]

[29] Apparently the pigeons like to sit in this tree - one consultant explained that it is because the bark is just about the same colour as the pigeons and that they are well camouflaged there. The bark is used to make a laxative tea.

The LS ='ay may also refer to *long, outstretched objects* as shown by the following examples.

(100)

a. y̌m̓-an	[y̌ím̓ʔʌn]	*bird's nest*
a'. y̌m̓='ay	[y̌ím̓ʔay]	*wing (of a bird)*

Tree, bush (non-productive LS): =əɬp

(101)

a. t̓$^{\theta}$č̓=əɬp='ay	[t̓$^{\theta}$áʔč̓ɩɬpay]	*Sitka Spruce*
b. mt̓$^{\theta}$=əɬp='ay [30]	[máʔ^{ə}t̓$^{\theta}$əɬp̓ʌy]	*stick for stringing clams, ocean spray, iron wood*

Water: =k^{w}u **Indep. form:** qy̓a [qáʔyɛ] *water*

(102)

a. sin=k^{w}u	[sénk^{w}u ~ sɛ́nk^{w}o]	*ocean*
b. t̓$^{\theta}$it̓$^{\theta}$iq̓-aɬ=k^{w}u	[t̓$^{\theta}$ét̓$^{\theta}$eq̓àɬk^{w}u]	*muddy water* (cf. t̓$^{\theta}$ét̓$^{\theta}$eq̓ *mud*)
c. miq̓-aɬ=k^{w}u-t-an	[mɛ́q̓aɬk^{w}ùtʌn]	*I'm soaking it* (soak clothes)
d. k̓^{w}ux̌̓=k^{w}u	[k̓^{w}úx̌̓k^{w}u]	*salt water* (cf. k̓^{w}ux̌̓-ɔm *salty*) [31]

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[30] The stick used for stringing clams needed to be a hardwood so that it would not burn as the clams were cooked over the fire. The Sliammon people used the branches of either the Common Snowberry (*Symphoricarpos albus*, Turner 1998: 165) or Oceanspray, also know as "Ironwood" or Rock Spiraea (*Holodiscus discolor*, Turner 1998: 181).

[31] I have also recorded: /q̓^{w}ux̌̓=q^{w}u/ [q̓^{w}óx̌̓q^{w}o] 'salt water' and /RED$_{PL}$-q̓^{w}ux̌̓=q^{w}u/ [q̓^{w}óx̌̓q^{w}ox̌̓q^{w}o] 'lots of salt water' and wonder if there may also be a =q^{w}u variant of this lexical suffix in addition to the =k^{w}u variant. Notice that the root to dig clams is /ʔuɬq^{w}u/ [ʔóɬq^{w}o] and the related Imperfective form is: /IMP-ʔuɬq^{w}u+[ʔ]/ [ʔóʔoɬq^{w}òʔ] 'digging clams'. Perhaps there is some difference in meaning signaled by the choice of =k^{w}u versus =q^{w}u. Perhaps the =k^{w}u variant is the stative form /=q^{w}u+stv./ whereas =q^{w}u is the non-stative counterpart. Do notice that the stative is often formed by [-i-] insertion. From a featural perspective, this is characterized as Dor [-back] (or Cor [ATR]) which if added to the features of the labio-uvular stop q^{w} could conceivably front q^{w} to k^{w}. This line of argumentation may be useful in solving some of the other velar/uvular alternations observed in other Salish languages.

e. qʷuqʷʔ-aɬ=kʷu	[qʷóqʷʔʌɬkʷu]	*soup*
f. ƛ̓q̓-aɬ=kʷu	[ƛ̓áʔq̓aɬkʷu]	*yeast (for making bread)* (ƛ̓əq̓ *rot, ferment*)
g. x̌pǰaʔan=kʷu	[x̌ʌ́pǰɛʔʌ̀nkʷu]	*back eddy*
h. ʔy̌-aɬ=kʷu	[ʔáʔy̌ɛɬkʷù]	*good, clear water*

Wave (of water): =unaxʷ

(103)

a. ti-tih=unaxʷ	[títhonaxʷ]	*big waves*

Wind, weather: =aʔaq **Indep. form:** puh-ʔəm [pú:ʔəm] *wind, blow*

(104)

a. t̓aq=aʔaq t̓aq̓- ?	[t̓áqaʔʌq]	*south-east wind*
a'. RED-t̓aq=aʔaq	[t̓ʌ́t̓qaʔaq]	*south-east wind*
a''. t̓aq̓-aʔ=aʔaq	[t̓áq̓aʔàʔaq]	*barn swallow*
b. k̓ʷas-INC=aʔaq	[k̓ʷásasàʔaq]	*becoming warmer*
c. ɬayiš=aʔaq	[ɬáyišɛʔaq]	*wind from the south*
d. č̓m̓-INC=aʔaq	[č̓ɛ́ʔmamàʔʌq]	*cold wind*
d'. CəC_{PL}-č̓m̓=aʔaq	[č̓ímč̓ɛmàʔʌqʰ]	*cold air*
e. q̓ʷyt=aʔaq	[q̓ʷə́ytʌʔaqʰ]	*wind from the north*

Young of a species, offspring, smaller in size: =úɬ

(105)

a. x̌ʷax̌ʷan̓i=uɬ	[x̌ʷáx̌ʷəneʔòɬ]	*small bullhead* (cf. x̌ʷáx̌ʷnɛʔ *bullhead*)
b. x̌ix̌iyaq̓-uɬ	[x̌ɛ́x̌iyɛq̓ɔ̀ɬ]	*small crab* (cf. x̌ɛ́x̌iʸəq̓ *crab*)
c. DIM-ɬag̓at̓=uɬ+[ʔ]	[ɬáɬgat̓ɔ̀ɬ]	*small herring* (cf. ɬáʔgʌt̓ herring)
d. x̌ʷupx̌ʷup-uɬ+[ʔ]	[x̌ʷópx̌ʷò·poɬ]	*small hummingbird*
e. DIM-ƛ̓ip=igs+[i]=uɬ	[ƛ̓ɛ́ƛ̓pegɪs·oɬ]	*bikini underwear* (extra small)
f. DIM-kʷm̓=nač=uɬ	[kʷíkʷʔəmnàčuɬ]	*extra small (cedar) roots*

g. DIM-mimġ=uɬ	[mé·mmaʔgʊɬ]	*real small kitten*

Possible lexical suffixes

Way of getting food, bait =aɟ̓u

(106)

a. mux̌ʷ=aɟ̓u	[móx̌ʷaʔɟu]	*belly button*
b. t̓ᶿum=aɟ̓u	[t̓ᶿó·maʔɟʊ]	*barnacle*
c. xʷƛ̓=aɟ̓u	[xʷʊ́ƛ̓aʔɟu]	*trout*

It may also occur in the following word for squirrel

(107)

a. kʷakʷaɟ̓u	[kʷá·kʷaʔɟu]	*squirrel*

Appendix VII:

The Predicate Complex and Affixes, Clitics, and Particles

This appendix provides a brief outline of the internal structure of the predicate complex, and documents the affixes and clitics which appear in the present work. The reader is referred to Appendix VI for information regarding the Lexical Suffixes in the language, and to Appendix V for a sample Root list. See also Watanabe (2000) for discussion of the form and functions of these affixes and clitics, as well as additional morphemes which are not cited in this present work.

This section presents a brief introduction to the internal structure of the predicate complex and is intended as a sketch which will provide appropriate background information on the morphology of the language, and is in no way intended as an exhaustive study. The reader is referred to J.Davis (1978), Kroeber (1988, 1991/1999), Blake (1996/1997) and Watanabe (2000) for further details. The structure of the predicate is often complex, as illustrated by the schema in (1). This schema is adapted from Watanabe (2000: 37) and includes the non-reduplicative plural prefix L'- which is motivated by the description and analyses discussed within this dissertation.

(1) **Predicate Complex**

$_4$[Proclitics $_3$[L'- $_2$[RED- $_1$[**ROOT**]$_1$ - RED$_{INC}$=LS-Ind/Rlt. - TR/ INTR]$_2$-Obj - Su]$_3$ enclitics]$_4$

The Root is the only obligatory morpheme within the predicate complex, and contributes significantly to the meaning of the predicate. The morphological Root is the central core and is located within the innermost morphological domain: [**ROOT**]$_1$. As proposed in Blake (2000), Lexical Suffixes (LSs) behave like bound Roots in Sliammon. This fact therefore raises the question of whether or not there is also a compound Root domain which includes the Root and an adjacent LS: [**ROOT=LS**]. The second domain in (1) (labelled $_2$[...]$_2$) is hypothesized to contain those suffixes and reduplicative prefixes which make up the morphological Stem domain. This domain includes the transitivizers and intransitive markers, although notice that this domain boundary is often obscured at the right-edge when the transitivizer is fused with the following Object suffix. Reference to the morphological stem or "Stem" domain is made throughout the dissertation. The third domain in (1) is the domain of the morphological word and includes the object and subject suffixes, as well as the non-reduplicative plural prefix /L'-/ discussed in Chapter 6. The fourth domain in (1) is a prosodic domain which corresponds to the Prosodic Word domain. This schema is a working hypothesis regarding the internal structure of the predicate. The predicate complex may well have a more highly-articulated internal structure than is indicated in (1), but explicit motivation of each morphological and phonological domain is beyond the scope of the present study (cf. Czaykowska-Higgins (1998) on Moses-Columbian Salish).

The data in (2) is organized in the following manner. Each morpheme is listed by a term which reflects the function of each affix/clitic. The middle column provides the proposed Input represenation for each affix/clitic, and the third column give an indication of the range of variants or "allomorphs" for each morpheme. Prefixes are followed by a hyphen (e.g. L'- plural prefix) whereas suffixes are preceded by a hyphen (e.g. -t Control Transitive suffix). Clitics appear without hyphens, and are separated from adjacent morphemes in the Input by a space (e.g. a question clitic, as in /x̌aƛ̓ a k^{w} θ ʔiɬtan/ [x̌áƛ̓a k^{w}ʊθ ʔέɬtʌn] *Do you (sg) want to eat?*).

(2)

Name	**Input**	**Variants**
Active intransitive: Intr.	-ʔm	[-m , ʔm, əm, ʔəm , aʔamʔ]
Active intransitive + stative	-ʔ[i]m	[ʔεm ~ ...]
auxiliary: be.there / it was	hi / hiɬ	[hε ~ hεʔ / hεɬ]
clitic	k^{w}u	[k^{w}u]
clitic (just now?)	k^{w}i/k^{w}y̓	[k^{w}i ~ k^{w}iʔ]
compound ligature	-aL	[aɬ ~ ay ~ aw ~ ...]
conjectural clitic/particle	č̓a	[č̓ε] (cf. Watanabe 2000)
desiderative	-am	[am]
diminutive glottalization	[ʔ]/[c.gl]	targets resonants

diminutive infix	[-i-]	
direct evidence (clitic)	kʷa	[kʷa ~ kʷaʔ] (Watanabe 2000)
established marker (cf. hi hw)	hw	[həw ~ hʌw]
future: 1sg.Su.+Fut.	tᶿ m	[tᶿəm]
future: 2sg. Su.+Fut.	čxʷ m	[čxʷəm ~ čxʷʊm]
future: 1pl. Su.+Fut.	št m	[štəm]
future: 2pl. Su. Fut.	čap sm	[čap səm ~ čɛp səm]
future: 3rd person Fut.	sm	[səm]
if	ga	[ga]
imperative: polite request	ga	[ga ~ gʌ]
imperative (second request)	giʔ	[giʔ ~ gi:ʔ]
imperfective glottalization	[ʔ]/[c.gl]	targets resonants
indefinite 3person object: *someone*	-anaq	[-anʌq]
intensive: *very*	-mut	[-mut ~ -mot ~ -mʊt]
intransitive	-aš	[-ʌš] (e.g. [ʔέmʌš] *walk*)
means, by means of	-ma	[-ma]
middle (cf. HW 1997)	-m / -Vm	[-m ~ ʌm ~ ɩm ~ ʊm ~ am]
middle + stative	-[i]m	
nominalizer (syntactic)	s	[s...]
oblique marker	ʔə	[ʔə ~ Ø]
particle	ʔut	[ʔot]
passive (main clause)	-m	[əm]
passive (subordinate clause)	-it	[-it ~ -et]
past	-'uɬ	[ʊɬ ~ oɬ ~ ʔoɬ ~ R'-oɬ ~ o]
plural (kinship)	-tən	[tən ~ tin ~ tʌn]
plural suffix	-'Vg	[-ig ~ -ug ~ 'ag ~ aw ~ ...]
plural prefix (non-reduplicative)	L'-	[iʔ ~ uʔ ~ aʔ]
question marker: yes/no Q (clitic)	a	[a ~ æ ~ hʌ ~ ʔa ~ ʔʌ]

quotative	k̓ʷa	[k̓ʷa ~ k̓ʷaʔ]
reciprocal:	-agɬ	[-awɬ ~]
Reduplicative Affixes:		
CH (Characteristic reduplication)	CVC- / CəC-	depends on shape of Root
DIM (Diminutive reduplication)	CV- / Ci-	Ci ~ Cu ~ Ca
IMP (Imperfective reduplication)	CV-	Ci ~ Cu ~ Ca ~ Cə
INC (Inchoative reduplication)	-VC$_2$	-iC ~ -uC ~ -aC ~ -əC
CəC$_{PL}$ (Plural reduplication)	CəC-	CɩC ~ CʊC ~ CʌC ~ CəC...
Ca$_{PL}$ (plural prefix)	Ca-	Ca-
reflexive: CTr.+Reflex.	-θut	[-θot ~ -aθot ~ -uθut ~ iθut]
stative (infix and suffix)	[i]/-it	[-it ~ ɛ̀t ~ ɛt ~ [i]]
transitivizer: Caus.	stg	[stu ~ st ~ stəxʷ ~ sxʷ ~ stəg]
transitivizer: CTr.	-t	[ʌt ~ ʊt ~ ɔt ~ ɩt ~ ɛt ~ t ~ Ø...]
transitivizer: NTr.	ng	[nu ~ n ~ əxʷ ~ nəg]
transitivizer: Tr.	-aš	[aš ~ ʌš]

The summary in (3-5) provides the Subject and Object pronominal markers in the language. Notice that the form of the Object suffixes is dependent upon which transitivizer (-t, -ng, -stg) precedes it.

Pronominal Markers in Sliammon

(3) **Pronominal Subject Markers**

(cf. Davis 1970 et seq., Kroeber 1991/1999, Watanabe 1994/2000, Blake 1996/1997)

Person	Main Clause-full	Main Clause-reduced	Subordinate (conjunctive)	Possessives
1sg	čan, čən	č	-an	t^{θ}
2sg	čaxʷ	čxʷ	-axʷ	θ
1pl	čat	št	-at	ms
2pl	čap	čəp	-ap	-ap
3person	Ø Intrans (3Abs) -as Trans (3Erg)	Ø Intrans (3Abs) -as Trans (3Erg)	-as	-s (3sg) -it (3pl)

(4) **Object Suffixes -Active paradigm** (with relevant transitivizer)

Person	Control Transitive -t	Noncontrol Transitive -ng	Causative -stg
1sg Obj	-θ (fused)	-nu-mš	-stu-mš
2sg Obj	-θi (fused)	-nu-mi	-stu-mi
1pl Obj	-t-umuɬ	-nu-muɬ	-stu-muɬ
2pl Obj	-t-anapi	-n-anapi	-st-anapi
3 Obj	-t-Ø	-(n)əxʷ-Ø	-stəxʷ-Ø→-sxʷ-Ø

(5) **Object Suffixes -Passive paradigm** (with relevant transitivizer)

Person	Control Transitive -t	Noncontrol Transitive -ng	Causative -stg
1sg Obj	-θay (fused)	-nu-may	-stu-may
2sg Obj	-θi (fused)	-nu-mi	-stu-mi
1pl Obj	-t-uw	-nu-muw	-stu-muw
2pl Obj	-t-anapi	-n-anapi	-st-anapi
3 Obj	-t-Ø	-nu-Ø (main clause) -nəg-Ø (sb. clause)	-stu-Ø (main clause) -stəg-Ø(sb. clause)

The articles in (6) appear frequently in sentential examples. A determiner typically precedes an overt Noun, and also co-occurs with the 1&2 sg and 1pl. possessive pronouns.

(6) **Determiners** (Davis 1974)

Determiners/Articles:	Subordinate clauses:
tə visible	tə introduces embedded clause whose truth is readily perceivable.
kʷ nonvisible	kʷ introduces embedded clause whose truth is not readily perceivable.
š remote	š [šʸ] introduces embedded predication which is remote in time.
ɬ (dim./sg. fem.)	ɬ is also used in embedded contexts-function not yet determined.