Prosodic and Morphological Factors in Squamish (Sḵwx̱wú7mesh) Stress Assignment

by

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We accept this dissertation as conforming
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ABSTRACT

This dissertation is an investigation of the stress system of Squamish (Sḵwx̱wú7mesh), one of ten languages that make up the Central division of the Northwest Coast branch of Salishan, a linguistic group indigenous to the Pacific Northwest region of North America. Although other researchers have previously investigated aspects of stress in the language, this work provides the first integrated account of the Squamish stress system as a whole, couched in an Optimality Theoretic framework.

The first two chapters are introductory, with Chapter 1 supplying a contextual background for the undertaking within linguistics, and especially within Salishan linguistics, while Chapter 2 provides a thorough grounding in the phonology and phonemics of Squamish in particular. Chapter 3 begins the formal analysis of stress in Squamish by examining the way stress surfaces in free root morphemes, which tend to stress penultimate syllables whenever they contain either a full vowel or a schwa followed by a resonant consonant. Given this outcome, Chapter 4 continues the investigation of basic stress patterns by looking more closely at the interactive roles of schwa, sonority, weight, and the structure of syllables and feet in Squamish stress assignment.

With the basic stress pattern established, the remaining chapters look at the outcome of stress in morphologically complex Squamish words. Thus, Chapter 5 is an analysis of stress in words involving prefixation, especially those resulting from CVC and CV prefixal reduplication, since non-reduplicative prefixes are unstressable; and

Chapters 6 and 7 investigate the occurrence of stress in polymorphemic words resulting from the addition of lexical suffixes and grammatical suffixes, respectively.

While stress in roots is generally predictable on the basis of phonological factors alone, that in polymorphemic words may also be influenced by morphological factors, as when a root or suffix has underlying lexical accent, and such factors then take precedence over phonological factors. In addition, prosodic domains play an important and interactive role.

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Abbreviations and Symbols

A	any vowel other than schwa
ab.	about (in glosses)
ASP	Aspect
c.	circa
C	any consonant
Cat	Category
CMP	Compound(ing)
Cw.	Cowichan
DIR	Direction(al)
fn.	footnote
Ft	Foot
GrS (GS)	Grammatical Suffix
Halc.	Halkomelem
INC	Incorporating
IPA	International Phonetic Alphabet
IO	Input-Output
TR	Intransitive (suffix)
K	any obstruent
L, R	Left, Right (directional)
LexS (LS)	Lexical Suffix
LOC	Locative
MCat	Morphological Category
MRoot (MR)	Morphological Root
MStem (MS)	Morphological Stem
MWord (MW)	Morphological Word
NAPA	North American Phonetic Alphabet
Nuc (N)	Nucleus
OB	Object
OT	Optimality Theory/Theoretic
PA	Primary Affix
p.c.	personal communication
PCat	Prosodic Category
PFX (PRE)	Prefix
PL	Plural
POSS (PS)	Possessive
PPhrase (PP)	Prosodic/Phonological Phrase
PRoot (PR)	Prosodic/Phonological Root
PStem (PS)	Prosodic/Phonological Stem
P-Hierarchy	Prosodic Hierarchy
P-Structure	Prosodic Structure
PWord (PW)	Prosodic/Phonological Word
R	any resonant consonant

RED	Reduplicant
Rt	Root
S	Singular
SB	Subject
SFX	Suffix
s.o.	someone (in glosses)
SOA	Squamish Orthographic Alphabet
Sq.	Squamish
s.t.	something (in glosses)
Syll	Syllable
TR	Transitive (suffix)
V	any vowel
WBYP	Weight by Position
WSP	Weight to Stress Principle
WT	Weight
√	Root
σ	Syllable
μ	Mora
-	designates a non-reduplicative prefix or a grammatical suffix
+	designates a reduplicant
=	designates a lexical suffix

Acknowledgments

This dissertation has been a long time in the making. In fact, it has been through so many incarnations that when I look at it, I half expect to see the proverbial cat with nine lives instead of this orderly bulk of pages, duly approved by examining committee. The fact of its completion I owe to a great extent to my dedicated and longsuffering supervisor, Ewa Czaykowska-Higgins, who has been a source of inspiration and encouragement throughout, providing endless and always constructive feedback on countless drafts, and who in the end was heard to exclaim: "RUTH, I am NOT reading ANY MORE DRAFTS!" Besides all that, she has proved a source of both funding and valuable experience in that she permitted me to take an active part in a few of her many projects, including the Moses-Columbia dictionary and the Salish Volume; as well she contributed funds toward my doctoral research from SSHRC grants awarded to her. Thanks for everything, Ewa!

Thanks are also due to the other members of my examining committee: my outside member, John Tucker, as well as my departmental members, Suzanne Gessner, who consented at short notice to fill a void left by a member on study leave, and, especially, to Suzanne Urbanczyk, who has been helpful in many ways, not least of which was her willingness to offer insights into the intricacies of Optimality Theory's inner workings.

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For my first taste of Salishan, I'm deeply indebted to Thom Hess, whose enthusiasm for Lushootseed and all things Salishan spilled over into his classrooms so that one could not help but be infected by it; and for subsequent encounters I thank Barry Carlson and Tom Hukari (not to mention Ewa Czaykowska-Higgins and Suzanne Urbanczyk, who have already figured in these acknowledgements).

Over the years I have had the privilege of meeting and interacting with a variety of other graduate and undergraduate students, and I have profited from knowing them. Among the grad students, a fellow Salishanist, Marie Louise Willett, deserves special mention for encouraging, inspiring, and especially for providing much-needed moral support in the final stages. GR thanks ML.

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Prosodic and Morphological Factors in Squamish (Sk̲wx̲wú7mesh) Stress Assignment

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Ruth Anne Dyck

June 4, 2004

Chapter 1

Introductory concepts

1.0. Overview

The assignment of stress in languages of the Salishan language family appears in general to be rather complex, and Squamish, a Coast Salishan language spoken in an area just north of Vancouver, British Columbia, is no exception, as the data in (1) show.[1]

(1)	a.	t'áq^{w}alʔ	'dry'
	b.	həwʔít	'rat'
	c.	hə́waʔ	'accompany'
	d.	č'əsp'iús	'ugly-faced'
	e.	cíqayʔámʔit	'poke (s.o.) in the shoulder'
	f.	sč'áwatumičátwit	'our helping you (pl.)'
	g.	smə́q'^{w}áʔ	'crane'

These data suggest that primary stress can surface on virtually any syllable in the Squamish word. For example, a single stress surfaces on the initial syllable in (1a, c) but on the final syllable in (1b, d). Moreover, (1e-g) show that it is possible for a Squamish word to contain at least two stresses, which may fall on alternating syllables, as is the case in (1e), but do not necessarily do so, as (1f) shows; in fact, as (1g) suggests, even adjacent syllables may be stressed.

[1]Unless otherwise noted, all data cited in this dissertation are from Kuipers (1967, 1969, 1989); any references to the "Kuipers corpora" likewise refer to these works.

Although it appears complex one might posit, based on studies of stress in other languages of the Salishan family (see, for instance, van Eijk 1985 and Roberts 1993 on Lillooet, Carlson 1989 on Spokane, Czaykowska-Higgins 1993a on Moses-Columbian, Bianco 1995 and Urbanczyk 1996[2001] on Lushootseed, Bianco 1996 on Cowichan, and Shaw et al 1999 on Musqueam), that stress in Squamish is nevertheless generally predictable and not idiosyncratic at all. Early analyses of Squamish stress (by Demers and Horn 1978 and Davis 1984a, 1984b) focussed mainly on the more obvious patterns of Squamish stress, failing to account for some of its more irregular features, leaving the researcher with a number of unanswered questions; these early works held that stress was phonologically driven. More recently, Bar-el and Watt (1998), Dyck (1998, 2000), Watt et al (2000), and Watt (2001) have examined some morphological and prosodic aspects of Squamish stress. Up to the present, however, there has been no comprehensive, unified account of the way a variety of phonological, morphological, and prosodic factors act and interact to produce the surface stress patterns observed in all types of Squamish words, including bare roots as well as both prefixed and suffixed forms; the aim of this dissertation is to fill this void.

Drawing primarily on data from Kuipers (1967, 1969, 1989), I will show three main facts about Squamish stress: (i) that Squamish has a tendency to stress the penultimate syllables of words, as an examination of both roots and morphologically complex forms shows, although simple and complex forms do so for different reasons; (ii) that Squamish leans toward stressing alternating syllables of morphologically complex words; and (iii) that the roles played by these phonological factors in assigning stress to morphologically complex Squamish words are secondary to and interact with the roles played by certain morphological and morphosyntactic factors, including, but not limited to, the type of root and affix(es) which together make up such a word. The data will show that like, for instance, in Moses-Columbian (Czaykowska-Higgins 1993a, 1993b), Shuswap (Kuipers 1993), Spokane (Carlson 1989, 1993), Thompson (Thompson and Thompson 1992), Squamish roots can be classified by whether they are accented or unaccented, and strong or weak, while suffixes can be classified as inherently accented, inherently unaccented, or unmarked for accent, and that where Squamish stress surfaces in a polymorphemic word depends in part on the particular combination of root and affix types that make up the word. In addition, the morphosyntactic functions assigned to individual morphemes within the word have a role to play in the outcome of stress, particularly in that of suffixed forms. A number of other phonological factors, including the relative sonority of segments, the form and structure of syllables, the status of schwa, and the notion of prosodic domains will also be demonstrated to play important and interactive roles in Squamish stress assignment.

1.1. Organization of dissertation

Following this introductory chapter, which both serves as a general introduction to the work and provides the descriptive and theoretical contexts for it, the remainder of this dissertation is organized as follows. Chapter 2 prepares the groundwork for an in-depth discussion of the stress system and syllable structure of Squamish by providing the descriptive contexts for it in terms of Squamish phonemics and phonotactics. The real meat of the dissertation then begins in Chapter 3 with the (phonological) analysis of stress in Squamish root morphemes. Addressing a number of issues that arise out of this analysis of root stress, Chapter 4 examines in some detail the status of schwa, the relative sonority of segments, and the structure of syllables in Squamish. Chapters 5 through 7 deal with the occurrence of stress in morphologically complex Squamish words, with Chapter 5 examining the effects on stress of prefixation and, especially, prefixal reduplication,[2] while Chapters 6 and 7 investigate the way stress patterns in suffixed forms, including words resulting from lexical (Chapter 6) and grammatical (Chapter 7) suffixation. Supplementary material is contained in a series of appendices, which include lists of Squamish roots (Appendix A) and affixes (Appendix B), a brief summarization of Squamish morphology (Appendix C), numerous examples of polymorphemic words involving both lexical and grammatical suffixation (Appendix D), and a list of the OT (Optimality Theoretic) constraints utilized in this dissertation (Appendix E).

1.2. Language basics

1.2.1. Language background

Squamish is one of 23 languages that make up the Salishan family of languages, spoken in various parts of British Columbia, Washington State, Idaho, Montana, and a small area on the coast of Oregon. Salishan-speaking peoples at one time occupied

> an all but continuous territory from the Pacific Ocean as far east as the Yellowstone and Missouri Rivers, and from the region of Rivers Inlet in British Columbia to a point far south of the Columbia River on the Oregon Coast. The total area covered was probably greater than that of France, for it included practically all of the present state of Washington, much of Idaho, and large portions of British Columbia, Oregon, and Montana (Swadesh 1952:232).[3]

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[2]Reduplication in Squamish is predominantly prefixal, and only prefixal reduplication is productive in the language, according to Kuipers (1967; see also Bar-el 2000).

[3]Thanks to Thom Hess for pointing this passage out to me.

The Salishan area is divided roughly into two main cultural and linguistic regions, namely, the Interior or Plateau area and the Northwest Coast area (Thompson and Kindade 1990; Czaykowska-Higgins and Kinkade 1998). The Squamish language itself is one of ten languages that make up the Central division of the Northwest Coast branch of Salishan. Traditionally inhabiting an area around Howe Sound and along the banks of the lower Squamish River and Cheakamus Creek (Kuipers 1967:7), the Squamish-speaking nation bordered on Sechelt to the north, Halkomelem to the south as well as to the west across the Strait of Georgia on Vancouver Island, and Lillooet to the east. Today the Squamish language is spoken primarily in and around the Burrard Inlet–Howe Sound areas of Vancouver, British Columbia. According to recent estimates (see, for instance, Bar-el and Watt 1998; Watt et al 2000),[4] the number of individuals who are native speakers of Squamish now stands at fewer than twenty, none of whom is under the age of 65.

1.2.2. Inventory of sounds

As is typical for Salishan languages,[5] the consonant inventory of Squamish comprises a more or less full slate of voiceless obstruents and resonants, given in (2); the vowel system, again like typical Salishan languages, consists essentially of the three most common vowels and a (mostly predictable) schwa; see (3).

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[4]Peter Jacobs of the Squamish Nation suggests 15 is a more realistic number. Note that some twelve years ago Cook (1992:368) estimated the total number of Squamish speakers to be 12.

[5]For a generalized inventory of Salishan consonants the reader is referred to Czaykowska-Higgins and Kinkade (1998:7, Table 2), but see also discussion in Chapter 2, section 2.1 of this dissertation.

(2) Squamish consonant inventory (adapted from Kuipers 1967:22)[6]

p	t	c		č	(k)	kʷ	q	qʷ	ʔ
p’	t’	c’	ƛ’	č’	(k’)	k’ʷ	q’	q’ʷ	
	s		ɬ	š		xʷ	x̣	x̣ʷ	
m	n		l	y		w			h
mʔ[7]	nʔ		lʔ	yʔ		wʔ			hʔ

(3) Squamish vowel inventory

i		u
	(ə)	
	a	

[6]The phonetic symbols used throughout this dissertation are those of the North American Phonetic Alphabet rather than its international counterpart, the IPA, the former system being the one most commonly employed in current research in the Salishan languages. The Squamish people have their own system of orthography; I do not make general use of this system here for reasons of economy and because it is customary in works of this nature to make use of phonetic alphabets. For the sake of comparison, however, I provide the Squamish orthographic symbols in (i), together with the corresponding NAPA symbols used in this dissertation.

(i) Squamish orthographic system (adapted from Bar-el and Watt 1998:427)

SOA	NAPA	SOA	NAPA	SOA	NAPA	SOA	NAPA
p	p	p’	p’	m	m	m’	mʔ
t	t	t’	t’	ts	c	ts’	c’
s	s	n	n	ch	č	ch’	č’
sh	š	lh	ɬ	lh’	ƛ’	l	l
k	k	k’	k’	kw	kʷ	kw’	k’ʷ
<u>k</u>	q	<u>k</u>’	q’	<u>k</u>w	qʷ	<u>k</u>w’	q’ʷ
<u>x</u>	x̣	xw	xʷ	<u>x</u>w	x̣ʷ	h	h
w	w	y	y	y’	yʔ	7	ʔ
e	ə	i	i,e,ɛ	u	u,o,ɔ	a	a

SOA: Squamish Orthographic Alphabet symbol
NAPA: North American Phonetic Alphabet symbol

[7]I follow Kuipers in designating glottalized resonants as, for instance, /mʔ/ rather than /m’/.

For a detailed description of the phonemics and phonology of Squamish the reader is directed to Chapter 2.

1.3. Descriptive and theoretical contexts

The remaining sections of this chapter consist of a discussion of the descriptive and theoretical contexts for this undertaking, beginning with what is primarily a summary of previous work on stress and syllable structure in the Salishan languages, although occasional reference is made to more broadly-based work in these areas as well: in section 1.4, I review the pertinent research for Salishan languages in general, in section 1.5, that for Squamish in particular. Section 1.6 then outlines what is at issue for this dissertation, bringing into focus questions and problems that need to be addressed and resolved regarding stress and the structure of syllables in Squamish in particular and in (at the very least) Salishan languages in general. The theoretical assumptions on which the analysis in this dissertation is based are stated in section 1.7.

1.4. Previous work on Salishan stress systems and syllable structure

This section, which comprises a review of the literature on Salishan stress and syllable structure in general, begins, in section 1.4.1, with an itemization of Salishan languages on which there is existing research in these areas along with the individuals who have performed the research. The discussion and review of the salient literature begins, in section 1.4.2, with a synopsis of the general types and tendencies of stress systems and syllable structures found in Salishan languages; with respect to the outline of general tendencies in these areas I rely heavily on summary information provided in Czaykowska-Higgins and

Kinkade (1998). The remainder of section 1.4 is given to more detailed discussions of particular areas of the research that deal with issues that have been shown to be especially important in analyses of Salishan stress and syllable structure in general and which will prove crucial in the analysis of Squamish undertaken in this dissertation. In these sections I focus particularly on research that bears on the following areas of work in Salishan languages: the nature of Salishan syllables (in section 1.4.3), the role of sonority in stress and syllable structure (section 1.4.4), the status of schwa and its role in Salishan stress and syllable structure (section 1.4.5), and the importance of morphological factors in determining the outcome of processes relating to word stress (section 1.4.6).

1.4.1. Researchers and languages

For the most part, analyses of Salishan stress to date have focussed on the stress systems of Interior Salishan languages; this includes work by van Eijk (1981a, 1985), Roberts (1993), and Roberts and Shaw (1994) on Lillooet (St'at'imcets)[8]; Czaykowska-Higgins (1993a) on Moses-Columbian (Nxaʔamxcín); Idsardi (1991b) and Kuipers (1993) on Shuswap (Secwepemctsín); Carlson (1989) and Black (1996) on Spokane (Npoqíníšcn); Thompson and Thompson (1992) on Thompson (Nlaka'pamux, Nłeʔkepmxcin); and Idsardi (1991a) on stress in Interior Salishan languages in general. In addition, a recent dissertation, by Revithiadou (1999), includes a chapter in which she applies her theory of

[8]Indigenous names of the languages are here given in parentheses. Except for first mention, the practice throughout this dissertation is to refer to Salishan languages by their non-indigenous names; in this I follow a not uncommon practice in the literature on Salishan.

head dominance to four Interior Salishan languages, namely, Thompson, Lillooet, Moses-Columbian, and Spokane.[9]

To date, the stress systems of Coast Salishan languages have received considerably less attention in the literature than have those of the Interior branch of the family, although the corpus of available literature has been steadily growing in recent years. Aside from Squamish (S<u>k</u>w<u>x</u>wú7mesh), the only Coast Salishan languages whose stress systems have been discussed in any detail in the literature are Saanich (Senčaθən), a Northern Straits dialect (Montler 1986); Lushootseed (Dx^{w}ləšúcid) (Bianco 1995; Urbanczyk 1996[2001]); Cowichan (Hul'qumi'num'), an Island dialect of Halkomelem (Bianco 1996, 1998); Musqueam (hən'q'əmin'əm'), a Downriver dialect of Halkomelem (Shaw, Blake, Campbell, and Shepherd 1999; Shaw 2001), and Sliammon (ʔayʔaǰúθəm),[10] a Mainland dialect of Comox (Blake 1992, 2000b).

1.4.2. Types and tendencies

1.4.2.1. Salishan stress systems

The work to date shows, as Czaykowska-Higgins and Kinkade (1998) point out, that the stress systems of Salishan languages fall into four main categories: (i) a morphologically-governed system, such as is found in almost all of the Interior Salishan languages (a noted

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[9]The bulk of Revithiadou's analysis of Salishan stress systems focuses on the stress systems of Thompson and Lillooet, with considerably less attention being given to those of Moses-Columbian and Spokane.

[10]Blake (2000b) reports that there exists a lack of consensus within the community as to whether this is the best designation for the language.

exception is Lillooet), which stresses the rightmost stressable syllable of a word; (ii) a system, like that found in Lillooet (van Eijk 1981a, 1985; Roberts 1993) and Squamish (Demers and Horn 1978; Davis 1984a, 1984b), in which stress tends to fall on the penultimate or final syllables of words but is subject to both weight restrictions and morphological factors; (iii) a system, like that of Saanich (Montler 1986), which stresses the penultimate syllable of a word and is affected by morphological factors but not by weight restrictions; and (iv) a fixed-stress system, like that of Sliammon (Blake 1992, 2000b), which stresses the initial syllable of a word.

Based on the existing research on stress systems in Salishan languages, Czaykowska-Higgins and Kinkade (1998) enumerate a number of tendencies exhibited by Salishan languages with respect to stress, namely: (i) the languages tend to exhibit three degrees of stress (primary, secondary, and no stress), but only primary stress surfaces reliably (or, at any rate, has been reliably transcribed); (ii) except for reduplicative prefixes, prefixes are almost never stressed; (iii) in the presence of full vowels in a word, schwas tend not to carry stress; and (iv) when unstressed, full vowels tend to be either reduced to schwa or deleted entirely in most languages.

In addition, many of the languages, including, for example, Moses-Columbian (Czaykowska-Higgins 1993a), Spokane (Carlson 1989), and Thompson (Thompson and Thompson 1992), tend to be identified as having at least three classes of roots and suffixes (strong, weak, and variable)[11]; these can be classified as forming a morphological hierarchy

[11]Some variability exists in the literature as to both the number of different root and/or suffix types and the specific terms used to talk about them; for instance, Montler (1986) claims that roots in Saanich are “strong”, “weak”, or “vowelless”, while he describes suffixes in the same language as “strong”, “ambivalent”, “weak”, or “unstressed”. It is clear

with respect to stress; the position of stress in a morphologically complex word then depends on the particular combination of root and suffix types that make up the word.[12] The morphological stress hierarchy for Salishan languages tends to be something like that given in (4); see Czaykowska-Higgins and Kinkade (1998:16).

(4) Morphological stress hierarchy in Salishan languages
Strong suffix > Strong root > Variable root[13] > Variable suffix > Weak root > Weak suffix

Section 1.4.5 goes into the question of the role of morphological factors in the stress systems of Salishan languages in more detail.

1.4.2.2. Salishan syllables

As for syllable structure, the fact that Salishan languages in general show a tendency to surface with long strings of consonants without intervening vowels has been frequently discussed in the literature. In fact, some languages, such as Bella Coola (Nuxalk) (Newman

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from Montler's description of the effects on stress of combining different types of suffixes with different types of roots that his use of the term "ambivalent" is not equal to the use of "variable" by Czaykowska-Higgins and Kinkade (1998) and others; see Montler (1986:23-24) for further discussion. Again, Czaykowska-Higgins (1993a) argues that in Moses-Columbian strong and weak roots can be further differentiated in terms of extrametricality, and accented and unaccented suffixes further distinguished by whether they trigger cyclic application of stress rules (dominant suffixes) or not (recessive suffixes).

[12]According to Revithiadou (1999), the influence on stress of the hierarchical accentual properties of roots and suffixes that make up a word are, at least for the most part, operative at the level of the morphological *stem*, which includes the root plus lexical suffix(es), rather than the morphological *word*, which includes the morphological stem plus grammatical suffixes (see Czaykowska-Higgins 1996); although there seem to be some effects that are due to accent in grammatical morphemes, Revithiadou suggests that at the level of the morphological word grammatical morphemes will receive stress unless they lack a vowel. For a discussion of Revithiadou's analysis of stress in Salishan see section 1.4.6.

[13]Note that variable roots are not posited for all of the languages.

1947; Hoard 1978; Bagemihl 1991), have even been analysed as having not only vowelless words but words without *any* sonorant segments (in other words, words consisting solely of strings of voiceless obstruents). Other syllable-related tendencies enumerated in Czaykowska-Higgins and Kinkade (1998) include the tendency for resonants in Salishan languages to have syllabic variants,[14] the tendency for glides, which generally alternate with vowels, to "function phonologically as consonants in morpheme structure constraints on roots and in reduplication" (1998:17), and the tendency for schwa (at least when unstressed) to occur only in closed syllables.

The following sections provide a more detailed discussion of individual research on the various aspects of Salishan phonology and prosody.

1.4.3. Syllable structure

Ever since Bagemihl's (1991) ground-breaking analysis of Bella Coola syllable structure,[15] in which he postulates a maximal syllable shape of CRVVC[16] despite widely disparate claims by other researchers that Bella Coola is without syllables entirely (Newman 1947), on the one hand, and that all segments in the language are potential syllable peaks (Hoard 1978), on the other, the study of syllable structure in other Salishan languages has gained

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[14]Czaykowska-Higgins and Kinkade (1998:16) note, however, that these syllabic variants of resonants "do not seem to constitute the sole syllabic nucleus in words of most of the Salishan languages (except Bella Coola) and rarely surface as stressed."

[15]Bella Coola is notably one of the more difficult languages to analyse in terms of syllable structure, exhibiting, as it does, not only long strings of consonants uninterrupted by vowels, but entire words consisting solely of obstruents.

[16]Here, as throughout this dissertation, C = any consonant, K = an obstruent, R = a resonant, V = any vowel (including schwa), and A = a full vowel.

ground, with Bates and Carlson (1992, 1998), Jimmie (1994), Blake (1992), and Czaykowska-Higgins and Willett (1997; see also Willett and Czaykowska-Higgins 1995) all arguing that, respectively, Spokane,[17] Thompson, Sliammon, and Moses-Columbian have a maximal syllable shape of CVC. With respect to other Salishan languages, Bianco (1994) claims that syllables in Cowichan are maximally CVCC, even though the majority of syllables in that language are CV(C) syllables, Urbanczyk (1996[2001]) posits that Lushootseed syllables are maximally CVC(C), and Matthewson (1994) argues for a maximal KCVCK syllable shape in Lillooet. The individual constituents that make up syllables in these languages are for the most part simplex. However, complex nuclei are posited for Bella Coola (VV); complex codas are posited for Cowichan (CC), Lushootseed (CC), and Lillooet (CK); and complex onsets are posited for Bella Coola (CR) and Lillooet (KC); in addition, Shaw (2002a) argues that Musqueam has complex KK onsets.

1.4.4. Stress and sonority

It has long been recognized that the relative sonority of segments can have a bearing on certain phonological processes, especially when it comes to matters relating to stress and syllable structure; for instance, for the majority of languages only the most sonorous segments in the language, notably the vowels, but sometimes also resonant consonants (see, for instance, Bagemihl's 1991 analysis of syllables in Bella Coola[18]; also see Zec 1995 on Kwak'wala, a non-Salishan language), may form syllable peaks and thus become eligible

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[17]Bates and Carlson (1992) argue for a maximal syllable shape in Spokane of C(R)VC.

[18]But, as previously mentioned, note also Newman's (1947) claim that Bella Coola has no syllables at all and, at the other end of the spectrum, Hoard's (1978) contention for the same language that any segment can potentially form a syllable peak.

to receive stress. When it comes to stress, even the most sonorous class of segments, namely, the vowels, may be ranked among themselves with respect to relative sonority, with /a/ being considered the most sonorous, and therefore the most likely to form the nucleus of a syllable and thus become eligible to receive stress, and schwa being considered the least sonorous and therefore the least likely to achieve syllable status or receive stress.

The hierarchy of segment sonority as it applies to syllables is expressed by Prince and Smolensky (1993)[19] in the form of a sonority scale, given in (5a), and a set of constraints on peak and margin prominence, given in (5b).

(5) a. $peak_{syll}$ a > e,o > i,u > ..... > p,t,k

$margin_{syll}$ p,t,k > ..... > i,u > e,o > a

b. Peak Prominence
*P/p,t,k >> ..... >> *P/i,u >> *P/e,o >> *P/a

Margin Prominence
*M/a >> *M/e,o >> *M/i,u >> ..... >> *M/p,t,k

Notice that voiceless stops, at the extreme right end of the $peak_{syll}$ sonority scale and at the extreme left end of the $margin_{syll}$ sonority scale in (5a), are the least sonorous segments and thus are the least likely to form syllable peaks and the most likely to be found at syllable margins. (5b) shows these sonority scales as a series of micro-constraints on syllable structure, where the constraint against positing voiceless stops as syllable peaks, namely, *P/p,t,k, is the highest ranked (as a result of being the most marked cross-linguistically) and that against *P/a is the lowest ranked (and the least marked). Conversely, [a] is the most likely candidate for a syllable peak and the least likely to occur at a syllable

[19]See also Clements (1990) on the role of sonority in syllabification.

margin. Notice also that not only are vowels ranked higher than consonants in general but they are further ranked against each other with respect to the likelihood of their forming syllable peaks or margin troughs. Positing individual segments or segment groups as a series of separate constraints on sonority, as in (5b), allows these micro-constraints to be interspersed, on a language-specific basis, among other constraints in the constraint rankings of individual languages, and thus makes it possible to account for data in those languages that might otherwise remain an enigma.

Prince and Smolensky's scales and constraints on syllable sonority, as given in (5a, b), are adapted in Kenstowicz (1994a) to apply to metrical feet as follows:

(6) a. $\text{peak}_{\text{foot}}$ á > é,ó > í,ú > ə́

$\text{margin}_{\text{foot}}$ ə̆ > ĭ,ŭ > ĕ,ŏ > ă

b. Peak Prominence for metrical feet
*P/ə >> *P/i,u >> *P/e,o >> *P/a

Margin Prominence for metrical feet
*M/a >> *M/e,o >> *M/i,u >> *M/ə

The sonority scales in (6a) and the constraints in (6b) indicate that not only are vowels ranked with respect to the likelihood of their forming the nuclei of syllables, but they are further ranked with respect to their eligibility to receive primary word stress, with /a/ being the most likely, and /ə/ the least likely, candidate for stress. Thus, not only do full vowels in general rate higher than schwa in this respect, but, among the full vowels, the low vowel /a/ rates higher than the mid vowels /e, o/, which in turn rate higher than the high vowels /i, u/.

Following Kenstowicz, Urbanczyk (1996[2001]) and Bianco (1996) have demonstrated for Lushootseed and Cowichan, respectively, that the relative sonority of vowels plays a major role in the assignment of stress in those languages. Bianco, for instance, uses Kenstowicz's (1994a) sonority hierarchy and the interaction of Optimality Theoretic constraints to explain why Cowichan words like /ʔiléʔəq/ 'in back of vehicle' surface with stress on the second syllable of the word rather than, as expected, on the first, since, by default, stress in Cowichan falls on the leftmost full vowel of a word. In brief, Bianco demonstrates the important role of relative sonority in the Cowichan stress system by showing not only that *P/i is outranked by *P/e, in accord with Kenstowicz's Peak Prominence for metrical feet constraint, stated in (6b), but that both of these sonority constraints outrank the constraint in Cowichan that ensures that the optimal foot form in that language will be a syllabic trochee parsed from the left edge of the word.

With regard to the relative sonority of consonants, Prince and Smolensky's syllable sonority scale, depicted in (5a), shows voiceless stops as being the least sonorous segments and therefore the least likely candidates to achieve syllable status. The scale makes mention of only the least sonorous consonants (namely, voiceless stops) and does not give a portrayal of how the rest of the consonant groupings are ranked with respect to sonority. Obviously, a major separation point in terms of sonority is that between obstruent and resonant consonants, these two classes being traditionally distinguished in terms of the feature [± sonorant], with obstruents being [− sonorant] and resonants [+ sonorant].

While all segments (including obstruent consonants) have occasionally been posited as possible candidates for syllable peaks in some languages (for instance, Bella Coola; see

Hoard 1978), the evidence cross-linguistically is undeniably that consonants, especially obstruents, are much better candidates for syllable margins than syllable peaks. Resonants, being sonorous consonants, are obviously more likely to be able to constitute the nuclei of syllables than are obstruents; nevertheless, in the main they tend to be (part of) syllable onsets or codas instead, albeit in complex consonant clusters they tend to appear next to the vocalic nucleus.

Although it is not an uncommon occurrence for languages to have at least some resonants that may form syllable peaks (for instance, English /m, n, l/ have syllabic variants [m̩, n̩, l̩]), in Salishan languages syllabic variants for resonants are par for the course. Czaykowska-Higgins and Kinkade (1998) cite the Thompson language as exemplifying the way syllabic resonants in Salishan languages behave, stating that

> ... in Thompson /m, n, l, y, w, m’, n’, l’, y’, w’/ become syllabic, or vocalized, or they are preceded by [ə], when they occur between other consonants and when they are word-final after a consonant. Word-initially before a consonant the nasals and liquids may be syllabic or may be followed by a brief central vowel, and glides are always followed by a central vowel; between a consonant and a vowel a resonant has a brief syllabic phase followed by its regular consonantal value, suggesting that it is ambisyllabic at least on the phonetic level (Czaykowska-Higgins and Kinkade 1998:16-17).

Bagemihl (1991) uses evidence from reduplication facts to argue that resonants in Bella Coola are on a par with vowels with respect to syllabicity. A strong piece of evidence is that syllabic resonants participate in the same sorts of reduplication patterns as vowels; for instance, the CVC- reduplicative form of /mn̩ɬk^{w}a/ ‘bear berry’ is /mn̩ɬ+mn̩ɬk^{w}a/ ‘plant of the bear berry’ rather than the expected */mn̩+mn̩ɬk^{w}a/, and the diminutive V- reduplication of /k’n̩c/ ‘sperm whale’ is /ʔn̩+k’n̩c-i/ (cf. /t’ixɬala/ ‘robin’ → /ʔi+t’ixɬala-y/

‘robin; diminutive’). In addition, in forming the habituative in Bella Coola, a process that entails lengthening of the penultimate syllabic nucleus of a reduplicative form, resonants undergo lengthening just as vowels do; compare, for instance, the forms /sk’ak’a-c/ → /sk’aak’a-c/ ‘I split again and again’ and /k’nk’nnca-c/ → /k’nk’nnca-c/ ‘I chop again and again, but not now’. If a vocalic nucleus were assumed in the cases involving resonants, the incorrect forms would be predicted.

While resonants in Salishan syllables are able to form the nuclei of syllables, they “do not seem to constitute the sole syllabic nucleus in words . . . and rarely surface as stressed” (Czaykowska-Higgins and Kinkade 1998:16); in almost all of the languages individual words are required to surface with at least one vowel-based syllable for stress purposes. Moreover, Kinkade (1998) suggests that schwa is always inserted in order to allow stress to fall on an otherwise vowelless root.

1.4.5. The status of schwa

A major factor in the stress systems of all of the Salishan languages examined to date (see, for instance, Blake 1992, 1999, 2000b on Sliammon; Matthewson 1994 on Lillooet; Czaykowska-Higgins 1993a on Moses-Columbian; Bianco 1996 on Cowichan; Urbanczyk 1996[2001] on Lushootseed; Shaw et al 1999 on Musqueam; as well as Kinkade 1993, 1998 on Upper Chehalis and Salishan language in general) is the much mooted, distinctly different effect on stress of schwa versus full vowels, namely, that processes of stress assignment tend to overlook schwa in favour of full vowels, even at the expense of disobeying default stress rules. The researchers cited here claim that schwa in their language of research is for the most part (if not entirely) predictable,[20] and therefore not underlying. If schwa is predictable, the explanation for its unstressability is straightforward: it is simply that, not being underlying, schwa is not available for stress at the time stress is assigned (although such an analysis is available only in a derivational model); in more general terms, schwa is not visible to stress rules.

1.4.6. Stress and the morphology

It is evident from Czaykowska-Higgins and Kinkade's (1998) summary of the typology of Salishan stress systems (as outlined in section 1.4.2.1) that morphological factors play a considerable role in the assignment of stress in a majority of the Salishan languages; in fact, morphological factors must be taken into consideration in at least the first three of the four major classifications given (see, for instance, Czaykowska-Higgins' 1993a detailed analysis of Moses-Columbian, which, like the majority of Interior Salishan languages, has a morphologically-governed system with default stress on the rightmost syllable), and, as pointed out in Czaykowska-Higgins and Kinkade (1998:15), work by Bianco (1995) on

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[20]But note that Jimmie (1994) and Black (1996) argue that schwa in Thompson and Spokane, respectively, cannot be unreservedly predicated to be a surface phenomenon. Black's argument that schwa in Spokane must be underlying is based on the observation that Spokane has three possible root shapes consisting of three consonants and no full vowels, namely, CCəC, CəCC, and CəCəC roots, and that it is impossible to predict, given an underlying structure of CCC (assuming for the moment that schwa is predictable), the exact location in the structure at which schwa would surface. Compare, for instance, the forms given in (i), which are taken from Black (1996:34); note that Black does not give glosses or show stress for these examples.

(i)	<u>CCəC</u>	<u>CəCC</u>	<u>CəCəC</u>
	c'p'əx̣ʷ	ƛ'əx̣t	č'ənəp'
	č'ləxʷ	p'əl'č'	č'əhək'ʷ
	ʔməkʷ	p'əc'q'ʷ	mələk'ʷ

Lushootseed suggests that even in the fourth type, namely, the fixed-stress system, stress patterns cannot be fully explained without making some reference to the morphology. In her analysis of stress in Northern Lushootseed, Bianco found that, although this dialect of Lushootseed has a fixed stress system which places primary stress on the leftmost full vowel of words, affixing a dominant suffix[21] to even a strong root[22] forces stress to shift rightward to the dominant suffix, thus resulting in the leftmost full vowel failing to surface with primary stress. The examples in (7), taken from Bianco (1995), show the different results on stress of adding dominant and recessive suffixes to strong and weak roots in Northern Lushootseed. Note that, of the two suffixes attached to the root in each of these examples, the final one is always recessive. I confine my comments to the suffix that varies with regard to stress, namely, the one nearest the root.

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[21]In many languages suffixes differ by whether or not they are able to trigger stress shift in stems to which they are affixed. Compare, for instance, the differing stress effects on English *generous* when the suffixes -*ness*, -*ly*, and -*ity* are added to the root.

(i)	génerous	háppy
	génerous-*ness*	háppi-*ness*
	gènerós-*ity*	háppi-*ly*

While adding -*ness* or -*ly* to the roots in these examples does not affect word stress at all, adding -*ity* causes main stress to shift two syllables to the right, at the same time maintaining a weakened stress on the originally-stressed syllable (in some instances, or in some languages, earlier stress may be erased). Suffixes like -*ness* and -*ly*, which have no effect on word stress, are recessive, while those like -*ity*, which cause stress to shift to another syllable, are dominant. In the terminology of cyclic lexical phonology, adding a dominant suffix to a stem causes stress assigned on a previous cycle to be erased, and word stress to be reassigned. It is important to note that a dominant suffix is not necessarily stressed or able to be stressed; for instance, the dominant suffix -*ity* in the example here is in fact unstressable. On the other hand, a recessive suffix may, though it need not, be stressable.

[22]Bianco analyses strong roots as roots that contain at least one full vowel, and weak roots as roots without an underlying vowel.

(7) a. Strong root[23]
- i. Dominant suffix: suffix stressed
  √ləliʔ=ákʷ=bixʷ ‘foreigners’
- ii. Recessive suffix: root stressed
  √húd=al-əp ‘burning on bottom’

b. Weak root
- i. Dominant suffix: suffix stressed
  √kʷəd=áy=ačiʔ ‘give a hand, help’
- ii. Recessive suffix: suffix stressed
  √dəx̣=ál=ačiʔ ‘space between fingers’

As the examples in (7) show, dominant suffixes in Northern Lushootseed surface with stress regardless of the type of root to which they are attached (that is, whether strong or weak), while recessive suffixes vary with respect to stress, with strong roots retaining stress and weak roots losing stress to the suffix. Clearly, then, morphological factors can play a role even in so-called fixed stress systems like that of Lushootseed.

While work like that by Bianco (1995) on Lushootseed serves to underscore the degree to which the morphology influences the placement of stress in Salishan, even in languages with fixed stress systems, it is restricted by a framework (namely, that of Lexical Phonology) which must make extensive reference to notions of underlying and surface structures, cyclicity of rule application, and the like. As well, some of the data appear to be unanalysable in this framework; for instance, Bianco (1995) is unable to account for varying stress patterns like those in (8).

[23]The following symbols are utilized in this dissertation: “√” is used to tag the root morpheme of a word, “-” designates a form as being either a non-reduplicative prefix or a grammatical suffix, “+” is used to indicate reduplicative morphemes, and “=” denotes a lexical suffix.

(8) a. √húd=al-əp
burn=lx.link-bottom
'burning of the bottom'

b. √hud=ál=g^{w}ił
fire=lx.link=canoe
'steamboat'

In each of the morphological concatenations in (8) a strong root is seen in combination with two recessive suffixes, the first of which is identical in the two words. However, the form in (8a) surfaces with stress on the root, while that in (8b) stresses the leftmost suffix. Bianco's explanation for the differential stress placement in these words is to say that certain combinations of recessive suffixes behave like dominant suffixes, and that such suffix combinations must be lexically listed with the feature Dominant. Under this analysis the suffix combination in (8b) would be lexically marked as [+ Dominant], while that in (8a) would be marked [− Dominant], an unsatisfactory explanation at best.

Other exceptional data, such as the seemingly idiosyncratic forms in (9) are presumed to vary as a result of lexicalization or borrowing.

(9) a. √č'ít=abac
'near side'

b. √č'it=ábac
'Saturday'

Notice that the words in (9a-b) actually consist of the identical root and the identical lexical suffix; in other words, other than differing in meaning, they differ only with respect to stress, where one has root stress and the other is stressed on the suffix. Clearly, the analysis is unable to come up with answers for some very important questions.

Apparently idiosyncratic data like that in (8-9) cannot be accounted for in terms of traditional theories referring to traditional notions of root and suffix "strength". As a possible solution to this problem, Revithiadou (1999)[24] proposes that many seemingly idiosyncratic stress patterns can be accounted for by looking deeper than the morpho-accentual properties of roots and suffixes into the morphosyntactic relations that obtain between the individual components of a polymorphemic word.

In brief, Revithiadou argues that in polysynthetic languages the placement of stress in a given word is influenced by whether that word is the result of a morphological or a syntactic process. Based on arguments (for instance, by Czaykowska-Higgins 1996, 1998) that the behaviour of lexical suffixes in Salishan languages resembles somewhat that of incorporated nouns, with the lexical suffix in the role of (a thematic) complement to the root (which is head), Revithiadou reasons that it is necessary to posit that word stress will differ depending on whether it is applied at the level of the morphological stem (which encodes the lexical content of the word, and includes the root and any locative, reduplicative, and primary affixes, such as the inchoative, as well as lexical suffixes) or at the level of the morphological word (which encodes morphosyntactic information, and comprises the morphological stem plus any grammatical affixes, such as aspectual, modal, reflexive, and reciprocal affixes).

According to Revithiadou, when the syntactic structure of a word is projected onto its prosodic structure the most important position or constituent will be the one that surfaces with main word stress. The structural head of a morphological stem is the root; thus, at the level of the morphological stem the root gets first consideration for word stress, and fails

[24]As mentioned earlier, Revithiadou's analysis of lexical accent in polysynthetic languages is based on earlier work by Thompson and Thompson (1992) on Thompson, by van Eijk (1985) on Lillooet, by Czaykowska-Higgins (1993a) on Moses-Columbian, and by Carlson (1989) on Spokane.

to be stressed only (i) if it is itself unaccented and is at the same time combined with an accented affix or (ii) if it is schwa-based.

In Revithiadou's view, then, the placement of stress in polysynthetic languages is governed by principles of word composition and head dominance. In addition, word stress can be affected by structural differences in Root–Lexical Suffix combinations in morphological stems. Based on work by Czaykowska-Higgins (1996, 1998), Revithiadou notes that Root–Lexical Suffix compound structures express modifier–head relations, in which the lexical suffix is the head, while Root–Lexical Suffix predicate structures express head–complement relations, in which the root is head.

Thus, instead of depending on classifications of roots and suffixes as strong, weak, or variable, which refer to "an idiosyncratic property of morphemes" (Revithiadou 1999:237), Revithiadou argues that stress in polysynthetic languages is the combined result of (i) the accentual properties of its constituent morphemes, which are either lexically marked or not, and (ii) the roles played by individual constituents within the structure.

1.5. Previous work on Squamish stress

Prior to 1999, the published literature on Squamish stress consisted essentially of three papers. Of these papers, only Bar-el and Watt (1998) examines the occurrence of stress in Squamish roots in any detail. Demers and Horn (1978) merely note that root stress is penultimate (or, more accurately, that individual morphological constituents surface with penultimate stress) and then devote the rest of their paper to a discussion of stress in polymorphemic words. Davis (1984a, 1984b), who assumes penultimate stress in the stem, focusses on the problem of how stress clash is resolved in polymorphemic words.

Aside from asserting that individual morphological units (Demers and Horn) or stems (Davis) have penultimate stress, both Demers and Horn (1978) and Davis (1984a, 1984b) are primarily concerned with establishing which of two stresses in a morphological word is primary and with how stress clash (that is, stress on adjacent syllables) is resolved in morphologically complex words. In the analysis by Demers and Horn, stress prominence is established as follows: the leftmost of two stresses is prominent if (i) there is stress clash and (ii) the environment is either CVCVC or CVCCəC; in all other cases, the rightmost stress is prominent. Davis (1984a, 1984b) postulates that stress assignment for Squamish is quantity-insensitive; however, he argues, although heavy syllables do not ordinarily attract stress, they do play a role in resolving stress clash.

Interestingly, while Demers and Horn (1978) and Davis (1984a, 1984b) all but take for granted that stress in Squamish is penultimate, Bar-el and Watt (1998) contend that stress in Squamish falls on the leftmost full vowel of the prosodic word, in other words, on the initial (non-schwa based) syllable of a root. Although the analysis in that paper is based on an examination of disyllabic roots only (in which initial stress and penultimate stress are one and the same thing), Watt (2000) more recently claims that stress falls on the initial (leftmost) syllable of trisyllabic roots as well. It should be noted, however, that this claim is based solely on the analysis of two forms, neither of which is in actual fact a root. The first of the forms in question is /shúhupit/ ‘rabbit’, which, although lexicalized, is clearly a reduplicative form, /s-hú+√hupit/; stress in this word conforms to the expected case in words involving /CV/ reduplication, namely, that primary stress falls on the reduplicative prefix (which happens to be the initial syllable of the word). The second form, /mə́lalus/

'raccoon', is again highly lexicalized but is analysed by Kuipers (1967) as likely consisting of a combination of the variable root /√mal, məl/ 'round' and the *l*-form[25] of the unaccented (that is, accentually unmarked) lexical suffix /=ayus/ 'eye'; if the root in question patterns with strong roots (recall that variable roots pattern at times with strong and at other times with weak roots), the stress on the initial syllable of the word is again as expected, since strong roots retain primary stress when in combination with unaccented suffixes.

Unlike Demers and Horn (1978) and Davis (1984a, 1984b), who use a strictly phonological approach to the problem of stress in Squamish words, Bar-el and Watt (1998) and Watt (1999) incorporate morphological as well as phonological factors in their approach. Following work by Czaykowska-Higgins (1993a) and Alderete (1996), they suggest that where stress falls in a morphologically complex Squamish word depends on the presence of lexical accent in the individual morphological constituents of that word. According to them, Squamish, like a number of other Salishan languages (see, for instance, Czaykowka-Higgins 1993a, 1993b on Moses-Columbian), differentiates two main types of roots (strong vs. weak, or accented vs. unaccented) and three main levels of lexical accent in affixes (inherently accented, unaccented, and inherently unaccented).

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[25]According to Kuipers:

> In a number of cases Sq. has forms with /l/ besides related forms with /y, i/. Since Halc.[sic] /l/ is one of the regular correspondences of Sq. /y, i/, these Sq. forms may be borrowings from a Halcomelem-type dialect. For such dialects I use the term *l-dialect*, and the forms in question are referred to as *l-forms*. Such l-forms are not limited to Halcomelem and other geographically close dialects. They are also encountered in Salish languages of the interior, e.g. in Kalispel (Kuipers 1967:247).

With respect to lexical accent in roots, Bar-el and Watt (1998) and Watt (1999) take the view that all roots consisting of only one syllable are unaccented lexically, whereas those consisting of two or more syllables are lexically accented. While my own research, based on the extensive Kuipers corpus, concurs with that of Bar-el and Watt in the classification of monosyllabic roots as accentually unmarked, it shows that, although some polysyllabic roots have lexical accent, the vast majority exhibit predictable stress patterns.

1.6. Current issues and motivation for this undertaking

The early accounts by Demers and Horn (1978) and Davis (1984a, 1984b) look at the problem of Squamish stress assignment as purely phonological. My own research and that of Bar-el and Watt, however, shows that morphological factors, specifically, the morphological properties of roots and suffixes, need also be taken into consideration, since (to take a relatively simple case) in disyllabic words consisting of a root and a suffix, stress varies according to whether the root contains a full vowel or schwa and (at the least) whether either or both morphemes are inherently accented, inherently unaccented, or stressable under the right circumstances.

Although the accounts of Squamish stress found in Demers and Horn (1978) and, especially, Bar-el and Watt (1998) make reference to the schwa versus full vowel dichotomy, in particular pointing out and providing evidence for the general reluctance of the language (like other Salishan languages) to stress schwa in words in which full vowels are also present, they do not make mention of the many instances in the data where schwa is in fact stressed in preference to a full vowel in the same word (especially, in roots), and consequently they have no explanation for why such cases are permitted to exist alongside the (perhaps more obvious) cases where schwa is not stressed. The research on which this dissertation is based shows that stress is attracted to syllables with weight, and that in these terms schwa is on a par with full vowels if it is immediately followed by a resonant (but not an obstruent) consonant. Essentially, it is this difference that is responsible for the noted differences in schwa stressability.

In addition, this dissertation undertakes the analysis of the Squamish syllable, which has not heretofore been dealt with in any detail (but see Bar-el 2000). The form and structure of syllables turn out to be crucial in the story of Squamish stress: the underlying reason that schwa is stressable when followed by a resonant but not when followed by an obstruent is that resonants are parsed as codas, in contrast to obstruents, which are parsed as onsets.

This dissertation shows further that while morphological accent does play a role in Squamish stress, its influence is curtailed by the relatively small number of morphemes that are marked accentually. As well, the role of morphosyntactic headedness, deemed all-important in Revithiadou's analysis of four Salishan languages, is found to be generally ineffective in accounting for stress in polymorphemic Squamish words, whereas an account based on prosodic domains is much more explanatory.

The work embodied in this dissertation contributes to our knowledge about stress systems in general, and those of Salishan languages in particular. It treats the subject of stress in Squamish in much greater detail than previous papers have; in particular, it integrates the sometimes disparate manifestations of and motivations for the behaviour of stress in roots and in words involving prefixation and/or suffixation. Furthermore, it provides an analysis of the Squamish stress system within an Optimality Theoretic framework[26] and shows that this framework is particularly apt at ferreting out the intricacies of a complex system of stress assignment such as that found in the Squamish language. Last but not least, it is one more work dealing with a language which is in grave danger of extinction.

It should be remarked that the research on which this dissertation is based is (deliberately) drawn primarily from the extensive early fieldwork carried out by Aert H. Kuipers in the 1960's and documented in Kuipers (1967, 1969, 1989). Although fieldwork is now again in progress (by Leora Bar-el, Linda Tamburri Watt, and a number of other researchers under the direction of Henry Davis of the University of British Columbia and in conjunction with Peter Jacobs of the Squamish community), there is a wealth of data in Kuipers that so far has been largely unexplored, and which must serve as the basis for all future work. By using the earlier corpora of Kuipers this work is able to provide a richer and more complete account of the stress system and syllable structure of Squamish than it would if based only on current research; in addition, it has the advantage of referring to current research, which in some instances is able to shed light on certain points that were hitherto obscure. Furthermore, to the extent that the aim of current and/or future research in the language is to document diachronic changes in its prosodic structure, this work will serve as a valuable tool for comparison.

[26]Bar-el and Watt have also used OT in their analyses of various aspects of the Squamish language.

1.7. Theoretical assumptions

Rule-based accounts such as those advanced by Demers and Horn (1978) and Davis (1984a, 1984b) have failed to explain adequately the complex nature of Squamish stress assignment, with its seemingly numerous exceptions to every rule. The sheer number and intricate interaction of phonological and morphological factors involved in the process call for a different, less rigid approach, one which emphasizes cooperation between the various factors involved rather than strict adherence to a set of rules. Optimality Theory (Prince and Smolensky 1993; McCarthy and Prince 1993a, 1993b), is just such a theory; and, as this dissertation will demonstrate, it is in fact remarkably well-suited to providing explanations to some of the more puzzling aspects of both stress assignment and syllable structure in Squamish.

In Optimality Theory (hereafter, OT) the set of possible outputs (surface representations) corresponding to a particular input (underlying representation) are provided by GEN, a function of Universal Grammar. This set of outputs is then evaluated by another function of Universal Grammar, EVAL, based on a language-specific hierarchical ranking of a series of universal constraints, CON. An important concept of OT is that its constraints are violable; thus the actual output form of a given input is spoken of as being the *optimal* rather than the *perfect* form.[27] The optimal output will be the output that obeys higher-

[27]This is part of what makes OT the elegant theory it is; if language behaviour is based on interacting but violable constraints so ranked as to provide the most complete and accurate explanation of the data, then it is no longer necessary to come up with separate and elaborate explanations for data that are counterexamples to posited rules. The beauty of OT, when it works, is in its ability to find general solutions to particular and sometimes disparate problems, that is, by making reference to the same constraints that were used to motivate the more obvious behaviour.

ranked constraints, but not necessarily lower-ranked constraints. It follows that the ranking of constraints within a language system is of utmost importance in ensuring that, given a list of possible outputs corresponding to a particular input, only the optimal candidate will be selected.

1.8. Chapter summary

This chapter has served as a general introduction to the Squamish language, its speakers, and its place within the Salishan family of languages. In addition, it has provided the linguistic contexts, both descriptive and theoretical, the framework, and the motivation for the research described in the balance of this dissertation.

Chapter 2

Language basics: phonemics and phonotactics

2.0. Introduction

In this chapter I provide the groundwork for an in-depth understanding and analysis of the stress system and syllable structure of Squamish. I begin, in section 2.1, with a phonological sketch of the language *per se*, providing a detailed description of its sound system,[1] and continue in section 2.2 with an account of the phonotactics of Squamish, demonstrating that the constituency and shapes of syllables in the language are entirely dependent on language-specific constraints (which, however, may be, and indeed often are, indicative of cross-linguistic constraints or trends) on segment position within a string and on adjacency factors. Throughout these sections I refer to work by other Salishanists in order to show how the Squamish language facts line up with those of other languages in the family group, both individually and generally.

2.1. Phonology and phonemics

This section consists of an essentially descriptive account of the phonological system of the Squamish language. I begin the account with a description of the consonantal and vocalic inventories that comprise the sound system of Squamish. In the process I demonstrate and

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[1]The description of the sound system is almost entirely based on information contained in Kuipers' (1967).

draw particular attention to the considerable extent to which the sonorant consonants of Squamish differ from its obstruents and to the equally considerable extent to which the sonorant consonants of the language resemble its vowels. As well, I include a subsection in which is demonstrated the predictability of Squamish schwa. These points will prove to be of paramount importance in the analysis of Squamish stress and syllable structure undertaken in this work.

2.1.1. Consonants

The consonant inventory of Squamish, which was laid out in (2) of Chapter 1, is repeated here in (1).

(1) Squamish consonant inventory

p	t	c		č	(k)	k^w	q	q^w	ʔ
p’	t’	c’	ƛ’	č’	(k’)	$k’^w$	q’	$q’^w$	
	s		ɬ	š		x^w	x̣	$x̣^w$	
m	n		l	y		w			h
mʔ	nʔ		lʔ	yʔ		wʔ			hʔ

The inventory of consonants in (1) shows that Squamish is typical of the Salishan languages in that it has a series of voiceless (but not voiced) obstruents, all stops have ejective counterparts, all resonants have glottalized counterparts, and velar and uvular obstruents have labial counterparts. Czaykowska-Higgins and Kinkade (1998:8-9) comment on the failure of many of the Salishan languages to distinguish between non-labial velar and palato-alveolar obstruents; that this is true for Squamish is attested in part by the presence in its inventory of a palato-alveolar but not a (non-labial) velar fricative. As for the corresponding plosives, although Kuipers includes /k, k’/ in his phonemic inventory of

Squamish, he remarks (1967:246) that their occurrences in the lexicon are notably rare, tending to be found only in loanwords which, for the most part, refer to semantic categories such as games, birds, artifacts, and nursery-words. I reflect the questionable phonemic status of these segments in Squamish by enclosing them in parentheses here. Like the other non-Interior Salishan languages, the Squamish consonant inventory does not include pharyngeals, retracted consonants, or flaps or trills.

2.1.1.1. Resonants

As regards resonant consonants, Squamish is again typical of Salishan languages in that the segments found in its resonant series generally correspond in place of articulation to those in its obstruent series, and also in that every resonant has a glottalized counterpart. Again like other non-Interior Salishan languages, the Squamish inventory does not include uvular resonants.

As is frequently found cross-linguistically, the nasal and lateral resonants of Squamish, /m, n, l/, are syllabic following another consonant (whether this consonant is an obstruent, including the glottal stop, /ʔ/, or another resonant) in the same morpheme[2]; compare, for instance, the phonetic outputs in /t<u>m</u>tám/ [tm̩táˑm][3] ‘when?’, /q<u>l</u>ím/ [ql̩éˑm] ‘weak’, and /t’<u>lm</u>áyʔ/, [t’ələmáˑyʔ^{i}] ‘wild cherry’ (a concatenation of /t’əlm/ ‘wild cherry’ and the lexical suffix /=ayʔ/ ‘tree, bush’), where the segments in question (underlined) are

[2]As I will demonstrate in this dissertation, the glides /y, w/ are similar to the nasal and lateral resonants in this feature (in this it resembles, for instance, Thompson Salishan; see discussion in Chapter 1, section 1.4.4). This is a pivotal element of my analysis.

[3][m̩] ~ [əm], [l̩] ~ [əl], etc., are alternative pronunciations in free variation.

in the same morpheme as the preceding consonant, with those in /músm̲əs/ [móˑsməs] 'cow' (a reduplication, though lexicalized) and /k'ʷáčn̲əxʷ/ [k'ʷáˑčnəxʷ] 'to see; tr.'(/-nəxʷ/ is a non-volitional transitivizer), where they are not. Exceptionally, when the preceding consonant consists of the nominative prefix /s-/ syllabification may take place across the intervening morpheme boundary, for instance, as in /sm̲ánit/ [sm̩áˑnit] 'mountain' and /sn̲əxʷíɬ/ [sn̩əxʷíˑɬ] 'canoe', but does not necessarily do so, as is evident from /sm̲nmánit/ [smənmáˑnit, smn̩máˑnit] 'mountains'. Kuipers (1969:9) states that nominalizer-R sequences are "optimally in non-syllabic contact", but adds that in reality the distinction is "hardly observable in any but the most careful enunciation." The fact that syllabification may exceptionally take place across this particular morpheme boundary betokens the high degree of lexicalization of nominalized forms in Squamish.

2.1.1.2. /h/

Although /h/ is not as a rule grouped with resonant consonants,[4] Kuipers (1967) classifies Squamish it as a laryngeal glide, basing his conclusion on a number of observations. In the first place, unlike many Salishan languages, in which the glottal fricative occurs only in

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[4]In fact, Czaykowska-Higgins and Kinkade (1998:8) point out that in many of the Salishan languages it is the glottal *stop* (and not the glottal fricative) that appears to function like a resonant; the foregoing generalization notwithstanding, Czaykowska-Higgins and Willett (1997) remark for Moses-Columbia Salishan that although "[t]he sonorant/obstruent status of the glottal fricative [h] has not yet been firmly established, ... it seems on the whole to pattern with the other resonants" (1997:386, fn. 4). While Squamish /h/ patterns with resonants, /ʔ/ does not: evidence from stress patterns in schwa-based or mixed roots shows that stress falls on schwa in the (default) penultimate syllable when it is immediately followed by a plain resonant, including /h/, but not when the following consonant is /ʔ/; for instance, compare /kʷə́laš/ 'shoot' with /ƛ'əʔə́nq/ 'potlatch' (see Chapter 3).

syllable onsets (Czaykowska-Higgins and Kinkade 1998:8), Kuipers holds that in Squamish /h/ regularly appears in syllable-final as well as in syllable-initial position, arguing that, in the coda of a word-final syllable, /h/ is produced as a lengthening of the vocalic nucleus in the same syllable,[5] with an optional schwa-coloured off-glide before a consonant (for instance, as in /č'ihn/ [č'eːn, č'ɛːn] 'lift, raise; tr.'; /puht/ [poːᵊt, pɔːᵊt] 'blow; tr.'; /c'əh/ [c'aː] 'get hit, bump'). Kuipers contends further that Squamish /h/ groups with the palatal and labio-velar glides in that it forms part of a diphthong series with schwa, as /əy, əw, əh/,[6] and that (like the stop and resonant consonant series, but unlike the spirants) it has a glottalized counterpart /hʔ/. Evidence for the latter comes from the existence of near minimal pairs such as /təhʔ/ 'undergo; be located' and /ɬəhʔ/ 'be touched', on the one hand, versus /c'əh/ 'be hit', /qʷəh/ 'be pierced', and /ʔəh/ 'hurt', on the other.

The notion of word- and syllable-final phonemic /h/ may seem speculative, since [h] does not actually surface in these environments. Kuipers' conclusion that the surface long vowels, namely, [aː; ɔː, oː; ɛː, eː], stem from vowel-*h* forms, namely, /əh; uh; ih/, is based on the observation of regularly-occurring morphophonemic alternations between long vowels and corresponding vowel-*h* sequences. For instance, the root /qʷə́h/ 'be pierced' is pronounced [qʷaː], that is, with a long vowel, when freestanding, but the same root is pronounced [qʷɔh, qʷæh], that is, with a short vowel-*h* sequence, in the suffixed form

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[5]Ordinarily, stressed vowels in Squamish surface as half-long (see section 2.1.2.4).

[6]For a detailed discussion of Squamish diphthongs see section 2.1.2.3.

/q^wəháyaʔniʔn/ (=ayaʔn ‘ear’) ‘pierce someone’s ears; tr.’. The short form of the vowel is typical in unstressed syllables.

While Kuipers’ conclusion that /h/ appears syllable-finally as an underlying segment is not questioned here, his classification of /h/ as a resonant is in conflict with evidence presented later in this dissertation, which shows that /h/ does not behave like the other Squamish resonants in that it is unable to attract stress to a syllable in which it occupies the coda. At least where stress is concerned, Squamish /h/ behaves more like obstruents than like resonants. This behaviour of /h/ in Squamish is after all not surprising in the light of Clements’ (1990) claim that cross-linguistically laryngeals tend to pattern with obstruents rather than with resonants, and, further, that they fall outside of the sonority scale entirely.

2.1.2. Vowels

In contrast to a fairly extensive consonant inventory Squamish, like the majority of Salishan languages, has a minimal vowel inventory consisting of three full vowels, /i, u, a/, and a schwa, which is mainly predictable. In addition, (as already mentioned) Squamish has a series of diphthongs, /əy, əw, əh/, which correspond roughly to, and are not entirely distinct from, the full-vowel series (Kuipers 1967).

2.1.2.1. Full vowels

Of the three full vowels of Squamish, /u/ is found notably less frequently in the lexicon than either /i/ or /a/. In this Squamish patterns after a number of Salishan languages with five-vowel inventories (examples are Halkomelem and Northern Straits), in which /u/ “is found only in loan words, or as a syllabic variant of /w/” (Czaykowska-Higgins and Kinkade

1998:10). Kuipers (1967) attributes this low frequency of /u/ in Squamish to the observation that the distinction between /u/ and its corresponding diphthong /əw/ appears to have been much better preserved than that between /i ~ əy/ and /a ~ əh/; the correspondence between full vowels and schwa–glide diphthongs in Squamish is discussed in some detail in section 2.1.2.3.

2.1.2.1.1. Surface variations of full vowels

The main phonetic variants of Squamish /i/ are [e, ɛ, ɛy, i]. The variant [ɛ] surfaces before uvulars but not necessarily adjacent to them as long as no vowel intervenes, [ɛy] is manifested between a preceding uvular and a following non-uvular consonant, and [e] surfaces elsewhere under stress, while [i] is [e]'s counterpart in unstressed syllables. Similarly, /u/ surfaces as [o] in stressed syllables but as [u] when unstressed; however, unlike the other vowels, this is essentially the only way in which surface /u/ differs from its underlying form. The low mid vowel, /a/, has the variants [ɛ, æ, ɔ, a], surfacing as [ɛ, æ] around palatals (with the exception of /y/) and as [ɔ] in the neighbourhood of labialized consonants (but not /w/), with [a] being the elsewhere case. Under stress and word-finally it is usually [a] that is heard, regardless of environment. The main phonetic variations of the full vowels are summarized in (2).

(2) Surface forms of full vowels

Phoneme	**Phonetic realization**	**Conditioning environment**	**Elsewhere**	
			Stressed	**Unstressed**
i	ɛ, ɛy	uvular	é·	i
u			ó·	u
a	ɛ, æ	palatal		
	ɔ	labial	á·	a

The distribution of surface variants shows clearly that there is a stress-related difference in the way full vowels surface in Squamish, namely, that vowel height is lost under stress. Another major difference between stressed and unstressed vowels is that stressed vowels exhibit greater duration than unstressed vowels (for instance, /a/ surfaces as [á·] in a stressed syllable but as [a] when unstressed), with the exception that stressed /a/ is short before a word-final consonant cluster (for example, the surface form of /náx̣č/ 'hand' is [náx̣č], and not *[ná·x̣č]).

As is the case in most Salishan languages, unstressed vowels in Squamish have a strong tendency to reduce to [ə] or even to zero. For instance, while the optimal surface form for /mə́lalus/ 'raccoon' is [mʌ́lalos], it generally surfaces as [mʌ́ləls].

2.1.2.2. Schwa

Work by a number of Salishanists who have investigated the status of schwa in Salishan languages (see, for instance, Kinkade 1998 on Salishan languages in general, Carlson 1989 on Spokane, Czaykowska-Higgins 1993a on Moses-Columbia, Bianco 1995 and Urbanczyk 1996[2001] on Lushootseed, Bianco 1996 on Cowichan, Shaw et al 1999 on Musqueam, Blake 2000b on Sliammon) points to the conclusion that schwa is largely predictable in Salishan.

This accords with Kuipers’ (1967:56) claim that the occurrence of schwa in Squamish is overwhelmingly predictable. Kuipers bases his contention on the following observations: (i) morphemes of the type /CəC/ (including the /Ci, Cu, Ca/ alternants of /Cəy, Cəw, Cəh/; see section 2.1.2.3) surface as /CC/ when unstressed and either preceded or followed by a vowel (for instance, in /t’k’ʷím/ ‘dig; act.-itr.’, < √t’ək’ʷ); (ii) root morphemes of the type /CC/ take the partial reduplication /Cə/ (for instance, in /tətsíʔ/ ‘feel cold’, < √təs); and (iii) a resonant is nonsyllabic morpheme-initially[7] (for instance, /smənmánit/ ‘mountains’, not */smənəmánit, smənm̩ánit/; cf. √mánit ‘mountain’) unless word stress falls between the two morphemes (for instance, in /tayə́wiɬ/ ‘racing canoe’, a concatenation of √tay ‘race’, =wiɬ ‘container, canoe’). The data in (3), (4), and (5), respectively, serve to illustrate these points.

(3) Schwa does not surface when morpheme boundary is adjacent to vowel

√t’k’ʷ-ímʔ	‘dig; act.-itr.’	√t’q’ʷ-ímʔ	‘chop; act.-itr.’
n-s-√t’q’=íws	‘side of body’	√t’x̣=áyʔus-m	‘open one’s eyes’
t’ə́x̣+√t’x̣=áyʔus	‘have the eyes open’	ʔəs-t’ə́+√t’k’ʷ	‘pit, dugout’
tə+√ts-íʔ	‘feel cold’	ʔəs-t’á+√t’q’	‘lying across’

(4) Schwa surfaces when morpheme boundaries are not adjacent to vowel

√t’əq’ʷ=mínʔ	‘broken-off half’	s-t’ə́q’ʷ+√t’əq’ʷ-s	‘cut up in chunks’ [geog.]
t’əq’+√t’áq’=ač	‘six (persons)’	t’ə́x̣+√t’əx̣=c	‘have the mouth open’

[7]Recall from section 2.1.1.1 that a resonant is syllabic when it immediately follows another consonant in the same morpheme.

(5) a. Morpheme-initial resonant is usually nonsyllabic

s-mn̩+√mánit ‘mountains’ ml̩+√mílč’ ‘get mixed up’

ʔn̩-√mə́nʔ ‘my child’

b. Morpheme-initial resonant is syllabic when required for stress

√q’^{w}q^{w}-ə́mn ‘ax’ (cf. √q’^{w}uq^{w}, q’^{w}əq^{w} ‘beat, strike’; -mn ‘formative’)

√tay-ə́wiɬ ‘racing canoe’

These examples show that between adjacent consonants schwa automatically surfaces under the following conditions: (i) when required for stress, and (ii) to prevent consonant clusters consisting of more than two consonants from surfacing. With regard to the latter point Kuipers notes that initial onsets consisting of more than two consonants always involve prefixation of either the nominal /s-/ or one of the forms /sx^{w}-/ ‘step-’or /tx^{w}-/, a directional prefix. Kuipers further points out that where longer medial and final consonant clusters are allowed to surface this is also as a result of morphological operations. Some examples are given in (6).

(6) a. Consonant clusters resulting from prefixation

sx^{w}-√čísaʔ ‘stepmother’ n-s-√t’q’=íws ‘side of body’

b. Consonant clusters resulting from reduplication

ʔəs-t’əx̱+√t’x̱=áčx^{w} ‘branchy, many-limbed’

c. Consonant clusters resulting from suffixation

ʔəs-√x̣ə́wƛ’=čq ‘lame’

Two main kinds of exceptions are found to the general predictability of schwa as described here. The first kind fails to insert schwa in some non-reduplicative prefixes (for instance, in /sx^{w}-√mán/ ‘stepfather’, not */səx^{w}-√mán/) and thus allows complex onsets consisting of more than two segments to surface. In the second type of exception a schwa appears in the root of a reduplicated stem (for instance, in /x̣ə́+√x̱əč/ 'remember', not */x̣ə́+√x̱č/) even when the consonant cluster does not consist of more than two consonants. Kuipers suggests that incidental svarabhakti vowels or reduced full vowels may be involved or, alternatively, that such exceptions may be the result of misrecording.[8]

2.1.2.2.1. Surface variations of schwa

Squamish schwa differs from full vowels in that it is both shorter, under stress as well as in unstressed syllables, and more variable than full vowels. In general terms, /ə/ is fronted to [e, ɛ, ɪ] in the vicinity of palatals (for instance, in /məy/ [mɛy, meʸ] 'sink; itr.'; /čə́šn/ [čɪšn̥]); it is lowered around uvulars, surfacing as [ɑ] around labialized uvulars and the labio-velar glide, /w/ (exemplified by /t'əq'ʷ/ [t'ɑq'ʷ] 'break; itr.'; /sxʷə́wqn/ [sxʷɑwqn̥] 'white swan'), and as [æ] when the uvular is non-labialized as well as before /lʔ/) (for instance, in /qəx̣/ [qæx̣] 'much'; /təlʔt/ [tæˡʔt); and it is rounded in the environment of dorsal labials and labialized consonants, surfacing as [ɔ] after labial segments that have the feature setting [+ back], namely, the labialized velars and uvulars, /kʷ, qʷ/ (demonstrated by /qʷəqʷtq/ [qʷɔqʷtq]), and as the mid front round vowel [œ] between a preceding or following [- back] consonant (including the glide /y/) and a following or preceding [+ back,

[8]Kuipers notes it would also be necessary to distinguish /-mš/ '1st person singular object' from /-miš, məš/, a formative. I suggest that two possibilities exist here. First, if the formative could be established to have lexical meaning a constraint differentiating lexical from grammatical suffixes might again work. The second possibility is to establish that the underlying form of the formative is /-miš/ and thus /-məš/ is simply its reduced form.

+ round] consonant or glide (as in /tək'^{w}/ [tœk'^{w}] 'tight'; /spəx^{w}/ [spœx^{w}] 'animal stomach, tripe'; /nəw/ [nœw] 'thou'). Elsewhere, schwa usually surfaces as [ʌ] under stress and [ə] when unstressed.

The main phonetic variations of schwa are summarized in (7).

(7) Surface forms of schwa

Conditioning environment	**Phonetic realization**
Palatals	e, ɛ, ɪ
Labialized uvulars; /w/	ɑ
Non-labialized uvulars; /l/	æ
Following dorsal labials	ɔ
Between [p, t, č, y] and dorsal labials [k^{w}, q^{w}, w]	œ
Elsewhere: under stress	ʌ́
Elsewhere: unstressed	ə

2.1.2.3. Diphthongs

In addition to the full vowels and schwa Squamish has three diphthongs, /əy, əw, əh/, the phonemic status of which is questionable in the absence of a clear, consistent distinction between them and the corresponding monophthongs /i, u, a/; especially in rapid speech, the two merge very readily (Kuipers 1967:28). Moreover, it is the diphthong, and not the monophthong, that regularly surfaces before vowels and at morpheme boundaries.

Of the three monophthong/diphthong correspondences, the distinction between /i/ and /əy/ is weakest. A distinction does, however, appear to exist in a few environments, for instance, before uvulars (as shown by /x̣əyx̣/ [x̣ɛyx̣, x̣ɛʸĭx̣] 'war', /ɬəyq'/ [ɬɛyq'] 'get trapped' vs. /ɬiq'/ [ɬɛᵃq'] 'always', /siqč/ [sɛᵃqč]'shingles') or word-finally (for instance, /məy/ [mɛy, meˑ] 'sink; itr.' vs. /mi/ [meˑ] 'come').

Evidence for a clearcut distinction between /a/ and /əh/ is similarly in short supply, the main piece of evidence being that, while /əh/ normally surfaces as [a:] under stress in the final syllable of a word,[9] as in /c'ə́h/ [c'á:] 'get hit, bump', /tə́hm/ [tá:m] 'to leak', counterexamples exist in words like /stám/ [stáˑm] 'what?'; if the form were underlyingly /stə́hm/ one would expect a surface representation of [stá:m].

The best preserved distinction between diphthong and monophthong is that between /əw/ and /u/. In general, the two merge only after the laterals /ƛ', ɬ/, as exemplified by /ɬup/ [ɬoˑp, ɬœwp] 'slide out of reach', and before vowels; recall from section 2.1.2.1 that the relatively clear-cut distinction between /əw/ and /u/ is cited as a reason for the rather infrequent occurrence of /u/ in the lexicon as compared to the other full vowels.

What has been stated here as regards the correspondences between plain diphthongs and monophthongs generally holds also when the glide involved is glottalized; that is, /əyʔ,

[9]Recall from section 2.1.1.1 that in a word-final syllable Squamish /h/ is produced as a lengthening of the vocalic nucleus of the syllable.

əwʔ, əhʔ/ are distinct from /iʔ, uʔ, aʔ/ roughly to the same extent that /əy, əw, əh/ differ from /i, u, a/.

In fact, the general pattern described here extends well beyond the question of whether a distinction exists between specific schwa–*glide* combinations and the corresponding full vowels to the question of whether a distinction exists between schwa–*resonant* sequences and full vowels, since there is in Squamish a manifest "near-absence of a distinction /əR/ *vs*. /A/ in unstressed position" (Kuipers 1967:58). Given the predictability of Squamish schwa (discussed in section 2.1.2.2), this points to the conclusion that the schwa–glide diphthongs discussed in this section are *not* phonemic, but rather are the surface manifestations of the underlying glides /y, w, h/ under stress (or, alternatively, under some other condition that forces epenthesis). In question, then, is not whether full vowels and schwa–glide diphthongs differ phonemically, but rather whether a *bona fide* phonemic difference exists between full vowels and glides in Squamish. Although this position may appear extreme, it is justified by the observation that the glides never co-occur in the same syllable with the corresponding vowel; that is, sequences */iy, uw, ah/ are disallowed in Squamish. Taken in conjunction with the lack of a clear, consistent distinction between schwa–resonant sequences and full vowels, this suggests that it is necessary to extend the group that up to this point was limited to glides to encompass resonants as a whole. The implication then is that in Squamish resonant consonants, already universally ranked high on relative sonority scales, are exceptionally vowel-like in nature, so much so, in fact, that they may take the place of a full vowel except under stress (cf., for instance, Bagemihl 1995 on Bella Coola). The main difference between resonant consonants and full vowels in

Squamish, then, is that the latter, but not the former, may be the recipients of stress. This has far-reaching implications for the analysis in this dissertation of stress and syllable structure, as we will see.

2.1.2.4. Vowel length

According to Kuipers (1967), Squamish exhibits three degrees of vowel length: short, half-long (ˑ), and long (ː). Full vowels under stress are usually pronounced as half-long, while their unstressed counterparts and stressed schwa are short. Unstressed schwa, if extant,[10] is somewhat shorter than unstressed full vowels. A long vowel is the surface manifestation of a combination of /i, u, ə/ and a following /h/ in the same syllable.[11] As part of a diphthong a vowel is usually short, even under stress.

2.2. Phonotactic constraints on syllable structure

In this section I give an account of the phonotactics of the Squamish language. I begin in section 2.2.1 with an examination of the various types of root shapes found in Squamish; this exercise provides an essential background to an understanding of how syllables are structured in the language. In the ensuing sections I examine and analyse the constituency and shape of Squamish syllables, focussing on syllable onsets in section 2.2.2, codas in section 2.2.3, and nuclei in section 2.2.4. This leads to a discussion, in section 2.2.5, of the basic syllable in Squamish.

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[10]As indicated in section 2.1.2.2, the position taken in this dissertation is that schwa in Squamish is a surface phenomenon; however, unstressed vowels in the language are in any case highly subject to processes of weakening and even deletion.

[11]*/ah/ is not an admissible sequence in Squamish.

2.2.1. Root shapes

Before proceeding to the analysis of the Squamish syllable as a whole and of its component parts, in this section I examine the shapes of root morphemes in the language, roots being the only units of meaning that can stand alone.[12]

Compared to some Salishan languages (for instance, Moses-Columbian; see Willett and Czaykowska-Higgins 1995; Czaykowska-Higgins and Willett 1997), which exhibit a relatively small inventory of root shapes, roots in Squamish show much greater variation. For this reason the analysis given here of Squamish root shapes is divided into three parts, based on the number of vowels contained in the root (a preliminary investigation showed that Squamish roots contain at most three vowels); thus, roots containing one vowel are investigated in section 2.2.1.1, roots with two vowels are explored in section 2.2.1.2, and those with three vowels in section 2.2.1.3.

Note that due to the syllabicity of resonants in the environment of an immediately preceding tautomorphemic consonant (see section 2.2.1.1.1 of this chapter) the number of vowels present in the representation of a root (or word)[13] is not necessarily indicative of the number of syllables in the root (or word). Thus a root represented as containing a single

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[12]See Appendix A for a complete listing of roots included in the analysis here.

[13]The representations of word forms in this dissertation are as given in Kuipers (1967, 1969), which are for the most part (and unless otherwise noted) in broad phonetic transcription. Thus, for instance, the only schwa-based roots I include in my counts in this section are those transcribed by Kuipers as containing schwa; particularly of note here is Kuipers' convention of not transcribing (except under stress) schwa between CR, where R is a syllabic resonant, although schwa can as easily surface as not in this environment. For the same reason, the counts include a number of forms which have been highly lexicalized, most especially, words that presumably contain the /s-/ nominalizer, since nominalized forms tend to be the only words beginning in /s/.

vowel may be, for example, disyllabic rather than monosyllabic as would ordinarily be expected. The decision to differentiate root shapes by the number of vowels rather than by the number of syllables in this explication of Squamish root shapes is to some extent arbitrary; nevertheless, it is at least in part due to a desire on the part of the writer to adhere as much as possible in this dissertation to Kuipers' representation of the language.

2.2.1.1. Roots with one vowel

The table in (8) shows that roots containing a single vowel can take a fairly large variety of different forms in Squamish. The vowel in these roots may consist of either a full vowel or schwa, and the root itself may contain as few as one and as many as seven consonants.

(8) Roots with one vowel

	Full-vowel		Schwa-based		Total
1C	CA	6			**6**
2C	CAC	185	CəC	104	**289**
3C	CACC	49	CəCC	33	**82**
	CCAC	32	CCəC	9	**41**
4C	CACCC	8	CəCCC	6	**14**
	CCACC	28	CCəCC	7	**35**
	CCCAC	7	CCCəC	1	**8**
5C	CACCCC	6	CəCCCC	2	**8**
	CCACCC	6	CCəCCC	8	**14**
	CCCACC	2			**2**
	CCCCAC	1			**1**
6C	CACCCCC	2			**2**
			CCəCCCC	2	**2**
7C	CACCCCCC	1			**1**

As shown in (8), Squamish roots with a single vowel come in 14 different root shapes. Thirteen of these root shapes are found in roots involving full vowels, while nine are found in roots with schwa. A comparison of these figures with those for Moses-Columbian (Czaykowska-Higgins and Willett 1997:390), which has five root types (namely, CVC, CCV, CVCC, CCVC, and CCVCC) in the first category and two (namely, CəC and CəCC) in the second, for a total of seven one-vowel root shapes, shows that Squamish allows a much more diverse type of root shape than Moses-Columbian. The difference, clearly seen in roots with a single vowel, is in the number of consonants the root may contain in addition to the vowel. While Moses-Columbian allows a maximum of four consonants (and never more than two in juxtaposition) in roots, Squamish permits as many as seven (and six in juxtaposition), as seen in (9), which, in essence, is a summary of the more detailed information on root shapes presented in (8).

(9) Summary of one-vowel roots by number of consonants

	Full-vowel	**Schwa-based**	**Total**
1C	6		**6**
2C	185	104	**289**
3C	81	42	**123**
4C	43	14	**57**
5C	15	10	**25**
6C	2	2	**4**
7C	1		**1**
Total	**333**	**172**	**505**

As the table in (9) shows, the vast majority (81.6%) of roots with one vowel contain either two or three consonants; those with two consonants alone constitute more than half (57%) of all one-vowel roots in the corpus.[14] Moreover, only ten percent of one-vowel roots contain more than two contiguous consonants. It is obvious from these facts that even though some (apparently) consonant-heavy root shapes do exist in the language, Squamish

[14]It is interesting to note that CVC-shaped roots are predominantly verbal/adjectival in meaning (90%, as opposed to 10% which have nominal meaning); in contrast, both monosyllabic roots with complex onsets and/or complex codas and polysyllabic roots are more likely to have nominal interpretation (62% of the former and 69% of the latter are nouns). This finding is parallel to one mentioned in Suttles (2004), who notes that in Musqueam nouns are more likely to be disyllabic, while verbs tend to be monosyllabic.

favours roots with fewer consonants in total and smaller (or no) consonant clusters. This tack will be further pursued in section 2.2.2, which defines what constitutes a consonant cluster for Squamish, a definition which is a necessary prerequisite to the subsequent analysis (in section 2.2.3) of the syllable structure constraints that operate in the language.

2.2.1.2. Roots with two vowels

The table in (10) lists the various shapes taken by two-vowel roots in Squamish. The vowel components of these roots consist of either two full vowels (which, in a small number of cases, are adjacent), two schwas, or a full vowel and a schwa in combination; in the latter case the full vowel may either precede or follow the schwa in the root. Thus, four types of vowel combinations are possible in Squamish roots with two vowels. In addition, these roots vary with respect to the number of consonants they contain, which may be as few as one and as many as five.

(10) Roots with two vowels

	Full-vowel		Mixed əA		Mixed Aə		Schwa-based		Total
1C	CAA	1							**1**
2C	CAAC	11							**11**
	CACA	17	CəCA	5					**22**
3C	CAACC	5							**5**
	CACAC	73	CəCAC	17	CACəC	2	CəCəC	3	**95**
	CACCA	10	CəCCA	3					**13**
	CCACA	3	CCəCA	1					**4**
4C	CACACC	1	CəCACC	1			CəCəCC	1	**3**
	CACCAC	7	CəCCAC	3	CACCəC	2			**12**
			CəCCCA	1					**1**
	CCACAC	20	CCəCAC	4	CCACəC	4			**28**
	CCACCA	1	CCəCCA	1					**2**
	CCCACA	1							**1**
5C	CCACACC	3	CCəCACC	1					**4**
	CCACCAC	1	CCəCCAC	6	CCACCəC	1			**8**
	CCCACAC	1			CCCACəC	1			**2**
	CCCACCA	1							**1**

The table in (10) shows that there are essentially 17 different configurations for Squamish roots containing two vowels; 16 of these root shapes have exemplars in which both vowels are full vowels, while schwa-based roots are represented in only two of these shapes. As for mixed-vowel roots, eleven of the root shapes are found in roots where schwa precedes the full vowel, as compared to five when the full vowel precedes schwa. Schwa is not found in a final open syllable.

The most common shape of roots with two vowels is clearly the CVCVC shape, with 95 exemplars in the corpus; almost 45 percent of all two-vowel roots have this shape. This percentage jumps to 62 percent when roots with initial and final consonant clusters (that is, roots with a (C)CVCVC(C) shape) are included in the count.[15] In fact, fewer than 17 percent of all two-vowel roots have adjacent consonants within the root as opposed to at root boundaries. It is clear from this that while Squamish has a preference for final syllables to be closed (this is the case for 93% of all roots: 79% of roots with two vowels, 84% of roots with three vowels, and 99% of roots with one vowel), nonfinal syllables are preferred to be open.

To facilitate further discussion of two-vowel root shapes the information in table (10) is reduced in (11) to a summary of two-vowel roots in terms of the vowel combination types and the number of consonants found in them.

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[15]The inclusion of roots with consonant clusters at the left boundary is justified by the fact that almost all of these roots have /s/ as the initial member of the cluster; as will be argued in section 2.2.2, such forms are fully analysable as polymorphemic (but lexicalized) forms containing the nominalizing prefix /s-/.

Here it should also be noted that in the few instances where apparent consonant clusters of three adjacent consonants are found in roots with two vowels, either the second or third member of the cluster is always a syllabification-triggering resonant.

An additional note: although roots with two adjacent vowels have been included in the count, they are rare in the language. These vowel clusters consist of distinct vowels with apparently neither glottal insertion nor diphthongization of the leftmost vowel to break up the hiatus. I have no explanation for this phenomenon at present.

(11) Summary of 2-vowel roots by vowel combination type and number of consonants

	AA	əA	Aə	əə	Total
1C	1				**1**
2C	28	5			**33**
3C	91	21	2	3	**117**
4C	30	10	6	1	**47**
5C	6	7	2		**15**
Total	**156**	**43**	**10**	**4**	**213**

The table in (11) shows that of the 17 root shapes found in roots with two vowels, the most common are those where both vowels are full; this type comprises more than 73 percent of the total number of roots with two vowels. At the other end of the spectrum, fewer than two percent of these roots have two schwas, and the remaining 25 percent are composed of mixed roots (20% with schwa preceding the full vowel, 5% with the full vowel preceding schwa). Also of note is that a large majority (78%) of roots in this category have a full vowel as the leftmost of the two vowels. However, when only mixed roots are considered the preferred vowel order is actually schwa before full vowel, with some 81 percent of mixed roots exhibiting this ordering.

The table in (11) further shows that, as expected (CVCVC being the most common shape for roots with two vowels), more than half (55%) of two-vowel roots have three consonants.

2.2.1.3. Roots with three vowels

The table in (12) lists Squamish root shapes containing three vowels. As the table shows, the vowel components of these roots may consist either of three full vowels or of certain combinations of schwas and full vowels (specifically, a schwa followed by two full vowels or two schwas followed by a full vowel), but never solely of schwas. Roots with three full vowels contain a minimum of three and a maximum of five consonants.

(12) Roots with three vowels

	Full-vowel		**Mixed əAA**		**Mixed əəA**		**Total**
3C	CAACAC	2					**2**
	CACAAC	1					**1**
	CACACA	2	CəCACA	1			**3**
4C	CACACAC	1	CəCACAC	2	CəCəCAC	1	**4**
					CəCəCCA	1	**1**
5C	CACACACC	1					**1**
	CACACCAC	1					**1**
	CCACACAC	4	CCəCACAC	1	CCəCəCAC	1	**6**

This table shows that Squamish has basically eight different shapes among roots with three vowels. Seven of these shapes have representatives in roots containing three full vowels; in contrast, mixed three-vowel roots are represented in only three of these shapes.

As expected from the analysis of two-vowel root shapes, the most common roots in the three-vowel root category are those with the shape (C)CVCVCVC(C), with a closed final syllable and open medial syllables; roots of this shape comprise approximately 58 percent of all three-vowel roots in the corpus.

A maximum of two adjacent consonants appear together in these roots, with only one such cluster found root-finally, and six in root-initial position.[16] All of the roots with clusters at the left edge have /s/ as the first of the adjacent consonants; thus they are actually stems containing the nominalizing prefix /s-/. The one root with what looks to be a consonant cluster at the right edge is /šupálitn/ 'iron',[17] in which the second of the adjacent consonants is a resonant; since post-consonantal resonants are syllabic, the root in this case must be said to have the syllabic pattern [CV.CV.CV.CR], which contains no consonant clusters.

The table in (13) summarizes the information on three-vowel roots in (10) in terms of the number of consonants and the type of vowel combinations found in them.

(13) Summary of 3-vowel roots by vowel combination type and number of consonants

	AAA	**əAA**	**əəA**	**Total**
3C	5	1		**6**
4C	1	2	2	**5**
5C	6	1	1	**8**
Total	**12**	**4**	**3**	**19**

[16] In addition, two roots with the shape CVCVCCV(C) have adjacent consonants internal to the root; in these cases the consonants in question are likely analysable as being in different syllables so are not consonant clusters in this sense.

[17] Although Kuipers lists it as a root, it is probable that this word is in fact a complex form containing the lexical suffix /=tn/ 'implement'.

2.2.2. Minimizing adjacent consonant sequences

The analysis and discussion of root shapes in section 2.2.1 revealed that although some Squamish roots contain contiguous pre-vocalic and/or post-vocalic consonant sequences (some relatively large) as opposed to single consonants, they constitute a minority of roots in the corpus. In this section I show that the occurrence of tautosyllabic consonant clusters is actually even less frequent than the earlier analysis leads one to expect. This conclusion is largely the result of reanalysing roots with post-consonantal resonants as polysyllabic and those with initial /s/ as polymorphemic (recall that initial /s/ occurs only in nominalized forms, which, however, are highly lexicalized). The discussion in this section will lead to a discussion (in section 2.2.3) of onset and coda cluster constraints and hence to an analysis of the core syllable in Squamish.

The table in (14) identifies root shapes, and lists the number of instantiations of each in the corpus, in terms of the number of contiguous consonants found at the left and right edges of Squamish roots, as well as within the body of the root. The corresponding figures for non-clusters are included for comparison purposes.[18]

[18]This table is to be read as follows, using as an example the first row of data in the table: 314 occurrences of two-consonant clusters are found in the corpus: 144 of these are in root-initial position (in 10 different root shapes), 38 are root-internal (in 7 root shapes), and 132 root-final (in 7 root shapes).

(14) Contiguous consonants in Squamish roots

	Root types			Instantiations			
Number of contiguous consonants	**Root-initial**	**Root-medial**	**Root-final**	**Total**	**Root-initial**	**Root-medial**	**Root-final**
2	10	7	7	314	144	38	132
3	5	1	2	43	14	1	28
4	1		2	11	1		10
5			1	2			2
6			1	1			1
Subtotal	**16**	**8**	**13**	**371**	**159**	**39**	**173**
1	23	16	15	1274	578	187	509
Total	**39**	**24**	**28**	**1645**	**737**	**226**	**682**

This table indicates that more than 77 percent of consonant instantiations in Squamish roots in the corpus consist of a single consonant rather than a number of consonants in sequence; this percentage is slightly higher for root-initial consonants (78.4%) than for root-final consonants (74.6%), and, in addition, almost 83 percent of intervocalic consonant instantiations are simplex. Thus, overall, single consonants are preferred over strings of adjacent consonants, and this preference is most obvious in root-internal and in root-initial positions.

The table in (14) shows further that the vast majority (approximately 85% overall: 90% when root-initial, 76% when root-final, and 97% when root-internal) of adjacent consonants, where they are found, consist of only two consonants in juxtaposition. In addition, some 12 percent of consonant sequences consist of three consonants, and fewer than four percent consist of more than three consonants. It should be noted, moreover, that no more than four adjacent consonants are found in root-initial position and no more than three adjacent consonants are found intervocalically; in fact, since a single example is found in the corpus of each of the CCCCV... and ...VCCCV.... root types, with four pre-vocalic and three intervocalic adjacent consonants, respectively, it can be stated that for all practical purposes adjacent consonants are limited to three in root-initial and two in root-internal positions.

To facilitate the analysis and discussion of syllable structure constraints in section 2.2.3, the following subsections examine the occurrence of strings of consonants in initial, final, and medial root positions, using the table in (14) as a guide. In each subsection, Squamish roots will be discussed in terms of the number of consonants they contain in juxtaposition, beginning with those shapes containing the longest consonant sequences. This will lead to a discussion in section 2.2.3 of constraints on syllable structure.

2.2.2.1. Roots with more than four adjacent consonants

There are only three examples in the corpus of roots containing more than four consonants in sequence. In all three of these examples the adjacent consonants are found in the post-vocalic position in one-vowel roots.

It should be noted that two of the full-vowel root shapes with the largest number of consonants (and consequently the longest adjacent consonant sequences) in Squamish are in fact names of individuals; the root shapes involved are CACCCCC and CACCCCCC, with six and seven consonants, respectively. The names in question are /qáqx̣ltn/ and

/q’átx̣mltxʷ/,[19] and although the long sequences of adjacent consonants (five in the first name and six in the second) look rather formidable at first glance, they are not at all daunting when the consonants are identified as to whether they belong to the class of resonants or that of obstruents, that is, as KAKKRKR and KAKKRRKK. Since resonants in Squamish are syllabic when they immediately follow another consonant in the same morpheme (as discussed in section 2.1.1.1 of this chapter), the sequences in question will syllabify as [KAK.KR.KR] and [KAK.KR.RKK],[20] respectively, each with three syllables; thus, the first of these roots ends up with no tautosyllabic consonant clusters at all, while in the second the number of contiguous tautosyllabic consonants is three (a resonant followed by two obstruents).

In addition to these names, however, there is another exemplar in the data that exhibits a five-consonant cluster (in root type CACCCCC); this is the root /síst’q’ls/ ‘single-bladed’.[21] Again, when the syllabicity of resonants is taken into account the five-consonant

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[19]It is possible that these should be considered morphologically complex forms, with the first name containing the suffix /=tn/ ‘implement (nominalizer)’ and the second, /=txʷ/ ‘house’; male names in Squamish frequently end in these sequences (see, for instance, Kuipers 1969:40-41). As well, it has frequently been observed that names of individuals and/or places do not necessarily adhere to the normal patterns found in a given language. However, it is not necessary to invoke either of these explanations to account for the facts here, since they are as easily and more economically explained by referring to the syllabic nature of resonants.

[20]Alternatively, syllabification in the second root could be given as [KAK.KR.(R)RKK], which shows the spreading of the resonant in the coda of the second syllable to the onset of the final syllable.

[21]Kuipers (1967:304) hypothesizes that /síst’q’ls/ may include the morphological elements /√t’aq’, t’əq’/ ‘across, transverse’ and /=c/ ‘edge’ (here represented in the final [s]), in addition to the diminutive suffix /-l/. The analysis of /√t’aq’, t’əq’/ as the root, however, is problematic, as Kuipers himself points out, in that it implies that the first part of the word

sequence is broken up as [KAKK.KRK], and a maximum of two obstruents appear together in a single syllable.

2.2.2.2. Roots with four adjacent consonants

The corpus contains eleven roots with four-consonant sequences; the roots in question are all one-vowel roots, and in all but one the adjacent consonants are root-final.

The same reasoning that was utilized in the previous subsection to account for roots with five and six adjacent consonants will suffice here; thus the syllabicity of resonants will serve to explain the long sequences of adjacent consonants in the six-consonant schwa-based roots of type CCəCCCC, namely, /ɬx̣ə́nptn/ 'floor' and /smə́tqsn/ 'snot'. Again, when the resonants in these roots are identified and the roots syllabified accordingly we get

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must be comprised of a (diminutive) reduplication of the nominalized form of the root, as in /sí+s-√t'aq', t'əq'/, rather than of the root itself, as in the expected /s-t'í+√t'aq', t'əq'/. In addition, my own study of reduplication in Squamish shows that affixing the diminutive reduplicant, which always takes the form /Cí+/, to the root usually also triggers vowel harmony in the reduplicated form, with the (first) vowel in the root taking on the quality of the vowel in the reduplicant; this results in the reduplicated form /C_1í+√C_1iC_2.../, as found, for instance, in /s-q'í+√q'iml/ (< /√q'ə́ml/) 'little paddle' and /lí+√litam (</latám/) 'little table'). Furthermore, even when this vowel harmony does not take place, as is the case in /lí+√lamʔ/ (< /√lamʔ/) 'little house', the vowel in the root is never reduced, much less deleted. For these reasons, an analysis of /sí+s-√t'q'.../ seems highly unlikely. (For the record, recent fieldwork by Leora Bar-el and Linda Tamburri Watt of the University of British Columbia indicates that diminutive reduplication in Squamish is no longer productive; this was probably already the case more than three decades ago when Kuipers performed his fieldwork, at least if the paucity of such forms in his grammar/dictionary is any indication.)

[KKəRK.KR] and KRəKK.KR], respectively, so that there are at most two tautosyllabic adjacent consonants.[22]

Three of the five-consonant one-vowel root shapes listed in (8) also include clusters of four consonants in juxtaposition; these include eight instances of type CVCCCC and one of CCCCAC. Taking into account the resonant–obstruent opposition, the cases found of the first type syllabify as [CACK.CR][23] in three instances, [CAC.CRK] in two instances, and [CA.CRKK] in one instance; as was observed in other root types containing apparently large clusters of coda consonants, no more than three contiguous consonants, and no more than two contiguous obstruents are found in a syllable coda. As for the type CCCCAC, its sole representative in the corpus is /slmčís/ 'ring', which breaks down syllabically as [C.RR.CAC] and thus contains no tautosyllabic consonant clusters at all.[24]

2.2.2.3. Roots with three adjacent consonants

As the table in (14) shows, one-vowel roots containing three-consonant sequences, while more prevalent than those with four-, five-, or six-consonant sequences, nevertheless

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[22]However, these words are again suspect as legitimate roots in the language: for /ɬx̣ə́nptn/, cf. /s-√x̣ə́n/ 'foot, leg' and /=tn/ 'implement (nom.)'; for /smə́tqsn/, cf. /mə́qsn/ 'nose' and /=qs/ 'nose'. Although words like these certainly appear to be morphologically complex, they are highly lexicalized, and my primary reason for including them here is that Kuipers' treats them as roots (not, however, without questioning the designation).

[23]For ease of explication in this analysis of root shapes, I henceforth single out for identification only resonants (not obstruents), and then only in those cases where they are syllabic (i.e., when they immediately follow another consonant); in all other cases, both resonants and obstruents will be identified by C.

[24]Kuipers (1967:291) suggests a possible analysis of this root as a combination of /√səl/ 'turn, spin around' and /=čis/ 'hand (formative)'; if this analysis is correct the word likely also contains the intransitive marker /-m/.

comprise only 2.6 percent (for a total of 43) of the 1645 instantiations of consonants in roots, and just 11.6 percent of the 371 instantiations of consonant sequences, in the corpus; of these, 28 (or 65%) are root-final, 14 (or 33%) are root-initial, and only one is in a root-medial position. All but five (four root-initial and one root-internal) of the three-consonant sequences are positioned in roots containing a single vowel, with the exceptions being found in two-vowel roots.

For these root types as well, reference to the syllabicity of resonants goes a long way in explaining the adjacent consonant sequences, since in the majority of instantiations in this category at least one of the sequential consonants is a resonant. Of the seven exceptions, five have the consonant cluster in root-final position. These include five roots with a root-final coda consisting of a resonant followed by two obstruents, and two schwa-based roots (namely, /wəłx̣s/ 'the time of the last snow, when the frogs come to life' and /sk'ʷəkʷčs/ 'red huckleberry') with a three-obstruent coda.[25]

In addition to the five exceptions with three-consonant clusters root-finally, there exist three exceptions, namely, /sc'tíšm/ 'harpoon-line (cedar)' /sxʷpílm/ [man's name], and /sq'ʷčə́m/ 'boil, abscess', with three adjacent consonants in root-initial position; in all three of these cases the initial /s/ must be interpreted as the nominalizing prefix /s-/, reducing the initial consonant cluster of the root *per se* to two.

[25]With respect to the first of these exceptions, Kuipers (1967:377) notes that speakers' intuitions imply some connection between this word and /wəx̣əs/ 'frog', though this does not explain the three-obstruent sequence in the coda. It should be noted, however, that in both of these cases the final obstruent is /s/ (in the latter case, cf. Cowichan /sk'ʷəqʷcəs/).

Thus, of the 43 instantiations of three-consonant sequences in roots only seven actually contain tautosyllabic three-consonant clusters, and in only two of these cases do the clusters consist solely of obstruents.

2.2.2.4. Roots with two adjacent consonants

Two-consonant sequences comprise almost 85 percent of all adjacent consonant sequences in Squamish roots and, as the table in (14) shows, 144 (or 46%) of the 314 instantiations in this category are root-initial, 132 (or 42%) are root-final, and only 38 (or 12%) are root-internal. A closer look at the roots in which two-consonant sequences occur reveals that in a large majority of cases one of the consonants involved is a resonant. The only possible concatenations of two-consonant sequences involving at least one resonant are RR, KR, and RK. Given the syllabicity of post-consonant resonants in Squamish morphemes, the sequences RR and KR, both of which have a resonant in the second consonant position, must be interpreted phonetically as RR̩ and KR̩ (or their variations RəR and KəR), and can therefore not be considered consonant clusters in the strict sense of the word. Eliminating these sequences from the count of two-consonant clusters reduces the number of CC instantiations considerably, as does factoring out roots beginning in the nominalizing prefix /s-/. Since intervocalic two-consonant sequences will in all likelihood parse into different syllables, they too may be discounted as tautosyllabic consonant clusters. Of the 314 contiguous consonant sequences given in table (14), then, only 114 (or 36%) are actually tautosyllabic and thus count as consonant clusters in the strict sense. Of these, 93 (58 RK sequences and 35 KK sequences) are root-final and 21 (all KK sequences) are in root-initial position.[26]

2.2.3. Constraints on syllable structure

The table in (14) showed that fully 77 percent of consonant instantiations of Squamish roots in the corpus consist of a single consonant; thus only 371 of the 1645 consonant instantiations consist of a sequence of two or more (to a maximum of six) adjacent consonants. It is important to note that this count is not of consonant clusters in the strict sense of the word (that is, they are not necessarily tautosyllabic consonant clusters). In fact, as was argued in the previous section, when the syllabicity of resonants and the polymorphemic nature of roots with initial /s-/ are taken into account the number of tautosyllabic consonant clusters is much lower, at 121 (21 root-initial and 100 root-final). Thus, just over seven percent of consonant instantiations in the corpus are actually tautosyllabic consonant clusters. This suggests that from a markedness standpoint both onsets and codas of Squamish core syllables are simple and that complex onsets and codas are marked in the language. In this section I present arguments for simple syllables.

2.2.3.1. Constraints on syllable onsets: evidence from root onsets

It has already been stated that onsets to roots consist of single consonants in almost 80 percent of cases. Of the 159 roots that have adjacent consonants in root-initial position, 144 consist of two adjacent consonants, 14 have three adjacent consonants, and one has four. With regard to the last-mentioned, two of the consonants in the root in question (namely,

[26] Because of syllable sonority restrictions (and in accordance with the Sonority Sequencing Principle), RK clusters in Squamish can only occur in codas.

/slmčís/ ‘ring’) are resonants and, as well, the root contains the nominalizing prefix /s-/; thus, after syllabification as [s-ləm.čís] no consonant cluster remains. When the remaining 158 root-initial consonant sequences of table (14) are dealt with in a similar fashion, only three of the roots with three-consonant sequences (all with /s-/) and 18 of those with two-consonant sequences are left, comprising 21 roots in all with true complex onsets. Thus, more than 97 percent of all roots in the corpus have simple onsets at their left edges. The exceptions are listed in (15), where the complex onsets are underlined.

(15) Root-initial complex onsets

ptúsm	‘cross oneself’	tqát	‘ask what’s going on, etc.’
t’q’áx	‘fall backward’	s-c’tíšm	‘harpoon-line (cedar)’
c’čə́l	‘kingfisher’	c’k’ʷíʔns	‘tuberculosis’
c’qʷáłč	‘marshy land’	č’qʷə́łp	‘Gibson’s landing’
č’q’ʷáp	‘tie up hair (Indian fashion)’	łqayč’	‘moon, month’
łq’íʔs	‘know’	łxə́nptn	‘floor’
łxílš	‘stand up’	kʷtáms	‘husband’
kʷcíʔs	‘person with magic power’	qʷpíčn	‘sand’
qʷtáycn	‘sturgeon’	s-q’ʷčə́m	‘boil, abscess’
xcə́m	‘cedar box’	s-xʷpílm	[man’s name]
xʷqʷíčn	‘make a net; itr.’		

Because the first member of a complex onset cannot be a resonant for reasons pertaining to sonority[27] and the second member is prohibited from being a resonant for reasons pertaining to syllabicity, the only cases of complex onsets are those with two adjacent obstruents. As the data in (15) show, the two members of a complex onset are not

[27]Technically, the left-most of two or more adjacent consonants may be a resonant if the second is also a resonant; however, such a combination will not result in a complex cluster at the left edge because the second resonant will be syllabic, [s-l(ə)m.čís] ‘ring’ being a case in point.

permitted to be exactly identical, nor may they be identical in terms of place of articulation. In fact, with four exceptions (namely, /p̲t̲úsm/ 'cross oneself', /s-c̲'t̲íšm/ 'harpoon-line (cedar)', /c̲'č̲ə́l/ 'kingfisher', and /x̲ʷq̲ʷíčn/ 'make a net; itr.') the complex onsets in question consist of a combination of a front (usually coronal) and a back (dorsal) place of articulation. With respect to the exceptions with similar places of articulation, it should be noted that at least two of them may in fact be complex forms rather than simple roots: Kuipers (1967: 248, 371) suggests that /p̲t̲úsm/ 'cross oneself' may contain the lexical suffix /=us/ 'face' and /x̲ʷq̲ʷíčn/ 'make a net; itr.' the formative /-ičn/ (in the latter case, cf. /x̣ʷúqʷm/ 'deep wooden bowl (used for eating soup)'). In fact, it is not inconceivable, given the high percentage of roots that consist of a single syllable, and a CVC syllable at that, that more of the exceptional cases of complex onsets turn out to be in words that are underlyingly polymorphemic.

In terms of manner of articulation, 14 of the onset clusters consist of adjacent stops, two consist of adjacent fricatives, and the remaining five consist of a fricative–stop combination in that order. No stop–fricative combinations of onset clusters were found root-initially; whether this is by chance is not clear at this point, but there is no reason to suppose that it is not since, if anything, cross-linguistic evidence points to fricatives as being slightly more sonorous than stops and thus more likely to appear next to the vowel.

It will have been noticed that of the 21 cases of root-initial complex onset clusters, only five comprise schwa-based roots; these are listed again in (16).

(16) Schwa-based roots with complex onsets

c’čə́l	‘kingfisher’	č’q^{w}ə́ɬp	‘Gibson’s landing’
ɬxə́nptn	‘floor’	s-q’^{w}čə́m	‘boil, abscess’
xcə́m	‘cedar box’		

The five schwa-based roots in (16) are in fact the only roots found in the corpus where schwa, being the first of one or more vowels, is preceded by more than a single consonant. Since left-edge onsets are simplex in 97.2 percent of roots (96.9% when the first vowel is a full vowel and 97.8% when the first vowel is schwa[28]), there is a clear indication that simple onsets are preferred in Squamish, and that complex CC onsets, though permitted, are marked.

2.2.3.2. Constraints on syllable codas: evidence from root codas

It has already been noted that root-final consonant instantiations consist of a single consonant in just under 75 percent of the roots in the corpus. Of the 173 instantiations of adjacent consonants at the right edges of roots, 132 consist of two adjacent consonants, 28 have three adjacent consonants, ten have four, two have five, and one has six.

After the syllabicity of resonants in sequences of root-final adjacent consonants has been taken into account, there remain some 93 roots with consonant clusters at their right edges.[29] Of these clusters, five consist of three consonants (three RKK sequences and two

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[28]The infrequent occurrence of root-initial consonant clusters in schwa-based roots and in mixed roots with schwa as the leftmost vowel also has something to say about the predictability of schwa in Squamish.

[29]This count also excludes men’s names ending in /-tx^{w}/ (see fn. 19).

KKK sequences) and 88 consist of two consonants (58 RK and 30 KK). The roots with final obstruent clusters are listed in (17).

(17) Root-final complex codas

p’əsk’^{w}	‘be squeezed’	p’íč’t	‘charcoal, ashes, black paint’
máʔk^{w}ɬ	‘get hurt’	túmlqɬ	‘starfish’
t’ək^{w}s	‘explode, be fired (gun)’	cəq^{w}ɬ	‘dark brown substance’
c’q^{w}aɬč	‘marshy land’	c’əqt	[type of woodpecker]
c’əxt	‘gravel beach’	natɬ	‘morning’
nax̣č	‘hand’	st’əlx^{w}c’	‘devilfish’
stíʔsč	‘size, measure’	sč’əlq’s	‘slingshot’
sk’^{w}ək^{w}čs	‘red huckleberry’	sáyips	‘cloth-pin’
siqč	‘shingles’	člʔáqɬ	?
čəɬq^{w}	‘pass through opening/hole’	číšk^{w}	‘to recede, ebb’
č’q^{w}əɬp	‘Gibson’s landing’	č’ətx^{w}	‘carve’
ɬ’aqt	‘long (space, time)’	k’^{w}uƛ’k^{w}	‘salt water’
k^{w}əɬč	‘be split open’	q^{w}ətq	‘pass’
q’^{w}iítq	‘gull’	x̣ač’t	‘fireweed’
x̣icq	‘fallen tree, timber’	wəƛ’č’	‘twenty’
wəɬxs	‘time of last snow’	wáʔtq	‘to man stern of boat’
yəƛ’q’	‘rub, paint’	ʔácq	‘outside’
ʔásq^{w}	‘seal’		

As with onset clusters, the majority of obstruent-only coda clusters consist of a combination of a front-articulated and a back-articulated consonant in either order. With respect to manner of articulation, 21 of the 35 coda clusters in question combine a stop and a fricative in some order, 13 consist solely of stops, and one (namely, /wəɬx̣s/), of fricatives. Moreover, with three exceptions, all front–front articulatory combinations in complex obstruent codas are to be found in stop–fricative or fricative–stop clusters. Thus, as with onsets, coda clusters appear to exhibit some restriction with regard to diversity in place of articulation and a reluctance to consist of fricatives only.

While right-edge coda clusters are observed more frequently in the data than are onset clusters, they are nevertheless relatively infrequent, comprising approximately 13 percent of root-final codas. This indicates that like onsets, codas are optimally simplex.

2.2.3.3. Root-internal evidence for simple syllables

The table in (14) shows that all 39 of the root types examined in the previous section, which constitute all root types found in the corpus, begin in a consonant; clearly, then, onsets are obligatory in the Squamish language. This being the case, at least the final in a sequence of adjacent intervocalic consonants must be taken as being an onset belonging to the same syllable as the vowel that immediately follows it. The fact that almost 83 percent of root-internal consonant instantiations are simplex suggests that nonfinal syllables are preferred to be open, thus preventing the outright claim that root-internal adjacent consonants belong to different syllables; however, it does seem likely that this is the case, given the clear preference for simple onsets. If so, and since there is only one example of a root with more than two adjacent consonants in root-internal position (namely, /pə́lx^{w}la/ 'Bella Coola'),[30] the evidence from root-internal consonant sequences supports the claim that Squamish syllables are optimally simplex.

If root-internal consonant sequences consist of at most two consonants, and given that syllabic onsets are required, nonfinal codas, where they exist, must be simple. However, (as already mentioned) because onsets are required, the majority of nonfinal syllables do

[30]Strictly speaking, /pə́lx^{w}la/, pronounced [pə́lx^{w}l̥a], has only two adjacent consonants because of resonant syllabicity.

not have codas. Whereas codas are required root-finally, they are not readily condoned root-internally.

2.2.4. Syllabic nuclei

Except for 17 roots with consecutive vowels, both full, all instantiations of vowels in the corpus are simplex; thus 96 percent of the 988 vocalic nuclei in the corpus are simple; the nucleus may consist of either a full vowel or schwa.

2.2.5. The basic syllable in Squamish

The marked preference in the Squamish data for simple onsets, codas, and nuclei points to the likelihood that CV(C) must be considered the unmarked syllable in the language. The examination of the data in this section on the phonotactics of Squamish leaves little doubt that, like nuclei, syllabic onsets are both required and optimally simplex. The question, if any, is whether the basic syllable should be defined in terms of having a coda, especially when, cross-linguistically, a CV syllable is basic. The evidence here for Squamish shows that open syllables are indeed preferred word-internally, and it is only at word edges that the presence of a coda can be taken for granted. Urbanczyk (1996[2001]) accounts for a similar phenomenon in Lushootseed in terms of the constraint in (18).

(18) C-FINAL-ROOT (Urbanczyk 2001:39)[31]
Align-R[Root, C]

C-FINAL-ROOT states essentially that every root has a consonant situated at its right edge.

[31]McCarthy (1993) earlier proposed a similar constraint to account for consonant-final prosodic words.

Although these sections have dealt primarily with the analysis of syllables in roots, which end in consonants, it is not unreasonable to assume (based on cross-linguistic tendencies to maximize onsets and minimize codas) that the root-final consonant becomes the onset to the initial syllable of a following suffix when it begins with a vowel. This suggests that the coda in Squamish is a requirement not of the syllable but of the root, and consequently, argues for a basic CV (and not CVC) syllable structure. However, as subsequent discussion in Chapter 4 will show, there is evidence that, while intervocalic obstruents are systematically parsed as onsets, intervocalic resonants tend to be parsed as codas (following full vowels as well as schwa), and therefore, that nonfinal favoured syllables must include CVR as well as CV shapes.

2.2.6. Section summary

The various subsections of section 2.2 examined the shape and constituency of roots in Squamish in order to set the stage for the subsequent analysis of syllables in the language; syllable structure plays an important role in Squamish stress assignment. The finding that root-internal consonant instantiations are predominantly simplex suggests that the basic syllable might best be described as having the (universally) canonical CV shape; however, subsequent analysis (see Chapter 4) shows that CV(R) is more apt, as intervocalic resonants are parsed into syllable codas.

While root-internal syllables tend to favour a CV(R) shape, root-final syllables are predominantly CVC in shape; thus, virtually every Squamish root (and word) contains at least one (and not usually more than one) CVC syllable. However, given that a good majority of roots are monosyllabic and exactly CVC-shaped, it seems likely that CVC represents the canonical root (rather than syllable). Although root-initial onsets and root-final codas are most often simplex, the existence of roots with complex onsets and/or complex codas indicates that a maximal syllable shape must be allowed of CCVCC, although this shape is clearly marked.

Chapter 3

Stress in Squamish roots

3.0. Introduction

In this, the first of five chapters that constitute the essence of this analysis of the stress system and syllable structure of the Squamish language, I undertake to establish the default stress pattern of Squamish, using a study of observed stress behaviour in Squamish roots to demonstrate that in the absence of vitiating factors (both morphological and prosodic), stress is strongly motivated to fall on the penultimate syllables of Squamish words. Having said this, although morphologically complex Squamish words frequently do surface with (at least secondary if not primary) stress on the penultimate syllable it is more likely to be by accident than by design; that is to say, penultimate stress in these cases is not determined by the default, but rather it is the byproduct of a combination of factors in Squamish stress assignment, including the accentual status of the individual morphological constituents in the word, coupled with a tendency for alternating stress to occur in words of four or more syllables and a general reluctance to stress the final syllables of words; in addition, prosodic domains also play a role in the outcome of stress in polymorphemic words.

In propounding a default penultimate stress pattern for Squamish I side with the researchers who first worked on Squamish stress, namely Demers and Horn (1978) and Davis (1984a, 1984b), who, however, did not so much argue for penultimate stress as take it as a given (see Chapter 1, section 1.5). In siding with the earlier researchers I go against the more recent analysis of Bar-el and Watt (1998; see also subsequent individual and collaborative work by Bar-el and Watt), who take the view that primary stress in Squamish falls on the leftmost full vowel of the prosodic word. The impression that Squamish stress is left-oriented on the one hand or penultimate on the other is, in both cases, largely an artifact of the effect and interaction of factors such as morphological accent, alternating stress, and constraints against stressing word-final syllables. Based on this, it seems at least equally likely that the default Squamish stress will be left-oriented as penultimate; however, as I demonstrate throughout this chapter, the evidence from the Squamish data in Kuipers (1967, 1969) favours a default penultimate stress theory.

The analysis of roots in this chapter, and that of other word formations in subsequent chapters, show that stress in the phonological root surfaces on a penultimate syllable that contains either a full vowel or schwa followed by a resonant consonant. While primary stress in polymorphemic words frequently concurs with that established for roots, it does not necessarily do so, as a number of factors, especially those pertaining to morphological accent and prosodic domains, also play a role in stress. The exact nature and role of these factors are the subject of focus in Chapters 5 through 7, which analyse prefixed (5) and suffixed forms (6-7), respectively.

Although the interaction of phonological and morphological factors are able to account for the patterns of stress observed in a sizeable portion of the Squamish data, they still leave gaps in the story of Squamish stress assignment, as the outcome of stress is also affected by factors pertaining to syllable shape, syllable weight, and the role and interaction of schwa and resonant consonants in syllabification and in stress assignment. Because these are issues raised by the analysis of root stress in the current chapter, they are addressed before going on to the analysis of morphologically complex forms, namely, in Chapter 4.

As was remarked in Chapter 1, the analysis throughout is in terms of Optimality Theory; the essential concepts and constraints of OT are introduced and motivated as they arise, and for general reference, a listing of relevant constraints is contained in Appendix E.

As has been reported for a number of other Salishan languages, including, for instance, Moses-Columbia Salish (Czaykowska-Higgins 1993a, 1993b) and Spokane (Carlson 1989), and as was conveyed in Chapter 1 (section 1.4.2.1), in what has more or less become an accepted view for Salishan languages, Squamish has two main classes of roots, strong and weak, and the majority of Squamish roots fall into one or the other of these classifications. As in Moses-Columbian, for instance, strong roots in Squamish tend to contain strong (in other words, full, underlying, unpredictable) vowels, which in Squamish are /i, u, a/, while weak roots tend to surface only with [ə].[1] Within certain restrictions imposed by affix type, strong roots attract stress in polymorphemic words while weak roots do not.

[1]This categorization of Squamish roots as strong/weak depending on vowel quality contrasts with that of Bar-el and Watt (1998), who use quantitative means to group them, classifying polysyllabic roots as strong, and monosyllabic roots as weak. However, the examination, in this and the next chapter, of stress behaviour in polymorphemic concatenations will show that in general both polysyllabic roots (almost all of which contain at least one full vowel) and monosyllabic roots with full vowels hold sway in contests for stress with affixes that are unmarked for accent. It should be noted that it is not the quality of the vowel *per se* that signifies, but rather the fact (as I argue in Chapter 4 and elsewhere) that full vowels are lexical as opposed to schwa, which is not.

The fact that Squamish schwa is predictable (for discussion, see Chapter 2, section 2.1.2.2), and therefore nonlexical, seems to suggest that so-called weak roots are weak by virtue of the fact that they contain no inherent vocalic input. The fact that uninflected weak roots surface with stress is due to a requirement for individual Squamish words with content to have stress: stress requires a vocoid and, in the absence of a full vowel, this requirement is satisfied by means of schwa-epenthesis. If this were all, there would be no need to posit a difference in root class, as the differing stress results could be easily explained in these terms. However, there is more to it than that.

It will be demonstrated in this chapter that resonant consonants play an important role in the way stress is assigned in bare roots, in that stress is attracted to a syllable containing either a syllabic resonant or a full vowel (in other words, a syllable with moraic weight), both being equally acceptable alternatives. This might lead one to conjecture that weak roots are weak by virtue of the fact that they have no moraic weight; thus, for instance, /qə́p’/ ‘close’ and /wə́x̣əs/ ‘frog’, which contain neither full vowels nor moraic resonants, would be considered weak, in contrast to /q’ʷə́ḻ/ ‘be cooked, ripe’ and /ƛ’əʔə́ṉq/, which lack full vowels but contain moraic resonants (here underlined). The evidence in subsequent chapters indicates that this conclusion is on the right track (if oversimplistic): stress in the prosodic stem (although not in the phonological phrase) does favour roots with full vowels or syllabic resonants, and shun roots that contain neither; for instance, compare the stress behaviour of /-at/ transitives /q’ʷə́ḻ-t/ ‘cook’ vs. /cx̣-ə́t/ ‘push’.[2]

[2] See Chapter 7, section 7.1.1, for discussion.

This suggests that if the terms “strong” or “weak” are applicable to roots in Squamish, they must refer to roots with weight on the one hand (i.e., those with full vowels or schwa–resonant sequences), and to roots with no weight on the other. The crucial factor, then, is not vowel predictability, but weight. However, as the analysis of polymorphemic words involving suffixation will show, the question is not really whether roots have weight, but rather whether syllables have weight. A division of roots in these terms is therefore irrelevant, at least in terms of stressability.

In addition to what are usually deemed strong and weak roots in Salishan literature, Squamish has approximately 20 roots that are variable in that they behave at times like strong roots and at times like weak roots with respect to stress. While weak roots surface only with schwa (or, in combination, with its zero form, but never with a full vowel), variable roots surface with schwa in some morphological concatenations and with a full vowel in others.

In the main, the vast majority of Squamish roots, indeed, all the roots here included under the strong and weak root classifications, and probably the group of variable roots as well, are unmarked for accent, given claims in this chapter that root stress is predictable.

3.1. Penultimate stress in Squamish roots

An examination of Squamish roots consisting of more than one syllable shows clearly that Squamish prefers not to stress the final syllables of words. In disyllabic roots (discussed in section 3.1.1), which constitute approximately 28 percent of free roots in Kuipers (1967), stress surfaces overwhelmingly on the penultimate syllable. However, penultimate and initial stress being one and the same in disyllabic words, it falls to an examination of words consisting of more than two syllables to authenticate the case for penultimate stress in the language. Since roots consisting of more than three syllables have not been found, and since even trisyllabic roots (discussed in section 3.1.2) are in seemingly short supply, constituting approximately two percent of Squamish roots,[3] the evidence from roots is sparse and perhaps less than satisfactory; nevertheless, it does point to the conclusion that stress in Squamish is by default penultimate.

3.1.1. Disyllabic roots

The table in (1) gives an indication of the demographics of stress in disyllabic Squamish roots.[4]

(1) Stress patterns in disyllabic roots

Root type	Total		Penult stress		Final stress	
AA	122	69%	104	85%	18	15%
Aə	9	5%	8	89%	1	11%
əA	46	26%	22	48%	24	52%
Total	**177**	**100%**	**134**	**76%**	**43**	**24%**

[3]Even this "approximately two percent" includes words whose status as roots can be put in question; for discussion and specific examples see section 3.1.2.

[4]It is possible that some of the words included in the root counts in (1) and in the lists of examples given in this section and the next of disyllabic and (especially) trisyllabic roots are in fact lexicalized versions of originally morphologically-complex words. In this matter, I generally allowed myself to be guided by Kuipers' (1967, 1969) analysis of individual words as free roots; however, I did occasionally exclude from my count polysyllabic words that seemed to me to be rather obviously polymorphemic as well (but never the reverse); thus any errors will be on the conservative side.

The table in (1) shows that in disyllabic roots the preference is clearly for stressing the penultimate (or initial) syllable (76%) and not the final one (24%). This is especially true when the penultimate syllable contains a full vowel rather than schwa, which is the case for 74 percent of disyllabic roots in the corpus: when the penultimate vowel is /a, u, i/ the percentage of disyllabic roots with penultimate stress rises by approximately ten percentage points to just under 86 percent. Thus the preference for stressing full vowels rather than schwa accounts for approximately 10 percent of disyllabic roots of types AA and Aə (that is, roots with a full vowel in the penultimate syllable) with exceptional final stress. However, even when the full vowel is in the final syllable and schwa is in the penultimate syllable (that is, roots of type əA), stress is still penultimate almost half of the time; this strengthens the case for penultimate stress in disyllabic Squamish roots.

3.1.1.1. Disyllabic roots with two full vowels

A sampling of disyllabic roots containing two full vowels is given in (2). The roots in (2) are further categorized by whether stress is on the penultimate or on the ultimate syllable (the a,b series); in addition, lower case Roman numerals (the i,ii,iii series) are in some instances used to further group roots according to particular patterns that are observed to affect stress placement in the root. It goes without saying that in disyllabic roots the penultimate syllable and the initial syllable are one and the same.

(2) Disyllabic roots with two full vowels[5]

a. Stress on penultimate syllable

yásaʔq^{w}	‘head-cover, hat’	t’áyaq’	‘get angry’	t’áq^{w}alʔ	‘dry’
sq’^{w}úmayʔ	‘hair (on head)’	míx̣ał	‘bear’	ʔímac	‘grandchild’
swúq’^{w}ał	‘blanket (Indian)’	níčim	‘speak, talk’	sáyam	‘sour; harsh’
k’^{w}áx^{w}aʔ	‘box’	t’áqaʔ	‘be bruised’	máqaʔ	‘snow’
ʔáłi	‘get hurt’	ʔáʔx^{w}a	‘light (weight), swift’		

b. Stress on final syllable

i.	ʔałtáč	‘parents’	ʔałx̣án	‘downstream’
ii.	ʔawʔíc	‘fast’	sayʔáx̣	‘a crack, leak’
iii.	timʔá	‘be like’	t’amʔí	‘go away’

When both vowels in a disyllabic free root are full vowels, as in the examples in (2), stress falls on the penultimate vowel 85 percent of the time. This is true especially when the penultimate syllable is open (which is so for about 73% of all disyllabic roots); notice that the penultimate syllable is open in all but one of the roots in (2a) (the exception is /ʔáʔx^{w}a/ ‘light (weight), swift’), which lists roots with penultimate stress, but that a number of the roots in (2b), which lists roots with final stress, have penultimate closed syllables; examples are /ʔałtáč/ ‘parents’ and /ʔałx̣án/ ‘downstream’. In contrast, a final open syllable is almost never stressed; only a few counterexamples (e.g., /timʔá/ ‘be like’ and /t’amʔí/ ‘go away’) were found in the corpus, and, in fact, such counterexamples tend to have the structure /CARʔA/). More generally, ten of twelve full-vowel disyllabic roots with final stress have the structure /CARʔA(C)/, with a glottalized resonant intervocalically.[6]

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[5]As mentioned previously, data are from Kuipers (1967, 1969) unless otherwise noted.

[6]The table in (1) includes a total of 18 AÁ type roots, six of which are loanwords from the French (e.g., /kapút/ ‘coat’) and from Chinook Jargon (e.g., /činúk^{w}/ ‘Chinook’) and

The fact that a final open syllable in Squamish is in general never stressed except when the vowel in the penultimate syllable is followed by a glottalized resonant suggests that a fundamental difference exists between glottalized and unglottalized resonants when it comes to assigning stress. A similar situation is reported by Zec (1995), who claims that in Kwak'wala glottalized resonants, unlike their unglottalized counterparts, are nonmoraic; see discussions in Chapter 1 and also, especially with regard to Squamish, Chapter 4.

A closer examination of disyllabic roots in the corpus shows that when both syllables are closed (as, for instance, in /ʔaɬ.táč/ 'parents' and /ʔaɬ,x̣án/ 'downstream'[7]), stress is almost as likely to fall on the final syllable as on the penult. Thus, in disyllabic roots containing two full vowels stress tends to be on the final syllable only in cases where the initial syllable is either closed or is followed by a glottalized resonant.

Penultimate stress in disyllabic roots with two full vowels implies either that stress falls on the leftmost or on the penultimate full vowel or syllable of a root or, alternatively, that final root stress is disfavoured. At this point in the analysis it is immaterial which of

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preserve the stress patterns found in the source languages; for this calculation the borrowed roots are discounted. (Squamish loanwords typically preserve the stress patterns found in the languages from which they are borrowed.)

[7]However, it is possible that /ʔaɬtáč/ and /ʔaɬx̣án/ are lexicalized forms containing, in the first instance, the lexical suffix /=ač/ 'hand, arm' and perhaps also either the /-at/ transitive or a phonetically-identical suffix with the meaning 'past, deceased', and in the second instance, a form of the /-n/ transitive and perhaps also /-x̣/, a "formative" (Kuipers 1967) of indeterminate meaning; this would account at least for final stress in the latter case, as the /-n/ transitive suffix typically takes stress when attached to CVCC roots or stems. The analysis here would presume an unattested root /ʔaɬ/; there is, however, a formative /-(ʔ)aɬ/, which Kuipers suggests forms part of words like /x̣ʷúmɬnaɬ/ 'windpipe, throat', /məqálxʷaɬ/ 'tongue', and /smánʔaɬ/ 'person of high class'.

these views is taken; however, based on the results of subsequent analysis (of trisyllabic roots, for which see section 3.1.2), I take the view that stress falls on the penultimate syllable.

The penultimate stress patterns seen in Squamish disyllabic roots with two full vowels can be accounted for in OT by utilizing the following constraints (Prince and Smolensky 1993; McCarthy and Prince 1993a, 1993b)[8], which parse words into binary trochees.

(3) FTBIN-σ: Feet are binary at the syllabic level.

(4) FTFORM=TROCHEE: Feet are trochaic, or left-headed.

(5) PARSE-σ: Syllables are parsed by metrical feet, else by the prosodic word.

While the evidence from disyllabic roots does not prove that Squamish words must be parsed into feet, since the identical effect can presumably be achieved by a single constraint that ensures stress does not fall on final syllables (like, for instance, McCarthy and Prince's (1993a) NONFINALITY constraint, which states that the final syllable in a prosodic word is unstressed), that from trisyllabic roots does (see section 3.1.2). Moreover, the fact that morphologically complex words consisting of more than three syllables frequently surface with additional stresses on alternating syllables[9] confirms that feet in Squamish are binary.

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[8]Unless otherwise noted, all constraints utilized here have their origin in these sources.

[9]According to Kuipers (1967, 1969) there is in Squamish an upper limit of two stresses per morphologically-complex word; however, recent fieldwork by Leora Bar-el and Linda Tamburri Watt suggests that any limit is dictated only by the number of syllables available for stress in a word (see, for instance, examples of morphologically complex words with lexical suffixes in Watt 2000); in this, then, Squamish resembles its traditional neighbour to the east, Lillooet (see, for instance, van Eijk 1981a, 1985; Roberts 1993).

The analysis in OT tableau form of the majority of disyllabic Squamish roots with two full vowels would then be as demonstrated in (6).[10] In the tableau, left/right parentheses are used to indicate corresponding foot boundaries in the output forms.

(6) /t’áyaq’/ ‘get angry’

Candidates	FTBIN-σ	FTFORM=TROCHEE	PARSE-σ
☞ a. (t’áyaq’)			
b. (t’ayáq’)		*!	
c. (t’á)yaq’	*!		*

In (6) both candidates (a) and (b) obey the constraint on foot binarity, but they differ crucially in that the winning candidate, namely, (a), also obeys the constraint calling for left-headed feet while (b) does not. Candidate (c), which posits a partially parsed form, fails on two of the three counts (a monosyllabic foot does not violate trochaicity). Note that the analysis here does not show a ranking order for the three constraints: the correct results are obtained by any ordering.

[10]A solid line between two constraints in a tableau denotes a crucial ranking between the constraints, while a broken line signifies that there is no crucial order. A pointing hand next to a generated candidate (in the first column of the tableau) identifies it as the optimal output. Feet are enclosed in parentheses, while square brackets indicate prosodic boundaries (e.g., phonological stem or word). Within a cell, “*” is used to indicate that a constraint has been violated, and “!” to show that the violation is fatal; the number of asterisks in a cell are equal to the number of violations of a particular constraint incurred by a candidate. A shaded cell indicates that whether or not the current candidate obeys the constraint in question is irrelevant to the analysis because the candidate has already fatally violated a higher-ranked constraint. To save space I generally include among possible outputs only the most plausible among them (although I may occasionally add one or two to demonstrate a point).

3.1.1.2. Mixed disyllabic roots and the role of resonants

Examples of mixed disyllabic roots, or disyllabic roots with a full vowel in one syllable and schwa in the other, are listed in (7).

(7) Mixed disyllabic roots

a. Stress on penultimate syllable

i.	kšáwəs[11]	‘bluejay’	tíwət	[Indian tribe]	sq’^{w}únəq	[term of pity]
ii.	qə́nax^{w}	‘throat’	k^{w}ə́laš	‘shoot’	stə́waq’^{w}	[a type of mud]
	hə́wan	‘dog’	šə́way	‘grow; itr.’	hə́waʔ	‘accompany’

b. Stress on final syllable

i.	sx̣^{w}lawə́ʔ	‘turnip’	hatə́hʔ	‘aunty (address term)’		
ii.	ʔəq^{w}ís	‘thin’	syəx̣ás	‘large rock’	səpíq	‘yellow salmonberry’
	ʔəcím	‘little’	x̣^{w}əʔít	‘wedge’	yəɬíx^{w}	‘Ash Slough’
iii.	həwʔít	‘rat’	həmʔí	‘come’	k^{w}əwʔíʔ	‘leave’

In mixed disyllabic roots with a full vowel in the penultimate syllable and schwa in the final syllable, examples of which are found in (7a.i), stress is virtually always on the full vowel in the penultimate syllable. For these, a similar analysis to that in (6) suffices, as demonstrated in (8), again with no indication of ranking between constraints.

(8) /kšáwəs/ ‘bluejay’

Candidates	FTBIN-σ	FTFORM=TROCHEE	PARSE-σ
☞ a. (kšá.wəs)			
b. (kša.wə́s)		*!	
c. (kšá)wəs	*!		*

[11]Kuipers (1967) also lists the alternate pronunciation /kšáws/. That the disyllabic form is preferred goes along with the observation (see Chapter 2, section 2.2.6) that roots with nominal meaning are more likely to be found among disyllabic than among monosyllabic shapes.

Two exceptions with final stressed schwa (7b.i) were found; these are /sx̣ʷlawə́ʔ/ 'turnip', a loanword of uncertain origin (Kuipers 1967), and /hatə́hʔ/[12] 'aunty (term of address)'.

It is hardly surprising that roots with a penultimate full vowel and a final schwa surface with penultimate stress. This is expected for two reasons: first, penultimate stress is the norm in disyllabic roots with two full vowels, as was established in section 3.2.1, and, second, schwa is not ordinarily subject to stress, as seen, for instance, in the Squamish examples in (7b.ii,iii) and, indeed, throughout the Salishan languages. What *is* surprising is that Squamish disyllabic words with schwa in the initial nucleus slot and a full vowel in the final one are almost as likely to surface with penultimate as with final stress (as the table in (1) shows, 48% of əA roots surface with penultimate stress), thus stressing schwa in preference to a full vowel.

As the data in (7a.ii) show, schwa in the penultimate syllable of a disyllabic root tends to be stressed when it is immediately followed by a non-glottalized resonant, as in /qə́naxʷ/ 'throat' and /kʷə́laš/ 'shoot'. However, when, penultimate schwa is followed by an obstruent (7b.ii), as in /ʔəqʷís/ 'thin' and /syəx̣ás/ 'large rock', or by a glottalized resonant (7b.iii), as in /həwʔít/ 'rat', stress tends to fall on the final full vowel. Between the two of them, these factors are able to account for 96 percent of əÁ roots, discounting borrowings. Thus, although Squamish does exhibit the usual reluctance to stress schwa when schwa

[12]Compare /s-(h)átaʔ/ 'aunt', which has penultimate stress.

immediately precedes an obstruent or a glottalized resonant, when followed by a plain resonant schwa is on a par with the other vowels where stress is concerned; that is, a schwa–resonant sequence in the penult will trigger default penultimate stress even in the presence of a full vowel elsewhere in the word.

One way to reflect the general unstressability of schwa in languages is to stipulate that it must not be parsed into a foot, since only licenced syllables are eligible for stress (see, for instance, Cohn and McCarthy 1994). Thus,

(9) *Ft(ə): Schwa-headed syllables have no metrical projection.

*Ft(ə) reflects the observation that schwa is generally predictable (and thus a surface phenomenon), therefore unparsable.

Under such an analysis, the list of candidates for /kšáwəs/, the Aə root analysed in (8), would include the partially unparsed form seen here in (10c).

(10) /kšáwəs/ 'bluejay'

Candidates	FTBIN-σ	FTFORM=TROCHEE	PARSE-σ	*FT(ə)
☞ a. (kšá.wəs)				*
b. (kša.wə́s)		*!		*
c. (kšá)wəs	*!		*	

The tableau in (10) is not conclusive on the status of *Ft(ə) in the constraint rankings (or if indeed it is relevant for Squamish): if FTBIN-σ >> *FT(ə), then candidate (a) would represent the optimal form; if the reverse ranking obtained, then the partially parsed candidate in (c) would win. The reason for the ambivalence is that the surface form has stress on the (penultimate) full vowel, and not on the (final) schwa. Similarly, the answer cannot be obtained from an analysis of words like /səpíq/ 'yellow salmonberry', which again do not stress the schwa-based syllable. However, roots like /k^{w}ə́laš/ 'to shoot', which contains penultimate stressed schwa, allow for some degree of resolution on this point. The tableau in (11) shows that if in fact *FT(ə) applies in the case of Squamish, it must be dominated by FTBIN-σ.

(11) /k^{w}ə́laš/ 'to shoot'

Candidates	FTBIN-σ	FTFORM= TROCHEE	PARSE-σ	*FT(ə)
☞ a. (k^{w}ə́.laš)				*
b. (k^{w}ə.láš)		*!		*
c. k^{w}ə(láš)	*!		*	

The analysis in (11) shows that failing to parse schwa is not a viable option in the analysis of mixed roots in Squamish, at least not in that of disyllabic roots, where the failure to parse one syllable automatically forces a violation of foot binarity and foot form in the other.

Clearly, a general constraint against projecting schwa, such as that in (9), will not do for Squamish: schwa is not only stressable, but stressed schwa occurs relatively frequently in the data, especially in roots.[13] An alternative approach is one that allows schwa to have

[13]The fact that schwa is stressable does not suffice as an argument for its footability, since OT constraints are not inviolable. However, subsequent analysis (for instance, in Chapter 4) will suggest that it must be footable.

metrical projection, just as do full vowels, but with the difference that the metrical projection of schwa is in the form of an empty nucleus, while that of full vowels has moraic content. This analysis is based on the notion (expressed, for instance, in Kager 1990; Shaw 1992, 1996; Kinkade 1998; see also Blake 1992, 1999, 2000b) that one of the main ways in which schwa differs from full vowels is that, unlike full vowels, it does not have moraic structure. Shaw et al (1999:135) represent the differences in the metrical projections of full vowels and schwa in the following way:

(12)

	a. full Vowels	b. schwa
Nucleus	Nuc	Nuc
	|	
Moraic weight	μ	
	|	
Root node	o	
	|	
Features	[f]	

If the main difference, as regards stress, between schwa and full vowels is not in the ability to project metrical structure but rather in the form that metrical structure takes, the stress differences between syllables with full vowels and those with schwa should be easily accounted for by making reference to Prince's (1990) well-motivated WEIGHT-TO-STRESS PRINCIPLE (WSP), which states that stress gravitates toward heavy syllables; this principle is given here in (13).

(13) WEIGHT-TO-STRESS PRINCIPLE (WSP): If heavy, then stressed.

The WSP evaluates the relative weight of all syllables in a particular stress domain (a metrical foot or a word) and deposits stress on the heaviest of these syllables; clearly, under an assumption of weightless schwa, such as that in (12), a syllable containing a full vowel would be preferred over a schwa-based one for stress.

While such an analysis is able to accurately account for approximately half of the əA roots in Squamish, specifically, those in which schwa is followed by an obstruent (7b.ii) or by a glottalized resonant (7b.iii), it cannot account for those in which schwa is followed by a plain resonant (7a.ii). The difference in stressability between Squamish syllables with a schwa–obstruent sequence and those with a schwa–resonant sequence (as represented, for instance, by /ʔəq^{w}ís/ ‘thin’ vs. /qə́nax^{w}/ ‘throat’) suggests that a weight differential exists in Squamish between plain resonant consonants on the one hand and obstruents and glottalized resonants on the other, with the former being weight-bearing and the latter being non-weight-bearing. In spite of this difference between /Rʔ, K/ and /R/, however, it is important to note that the stress assignment process in Squamish does not favour a syllable with a full vowel–resonant sequence over one with a schwa–resonant sequence; for instance, [ə] in the penultimate syllable of /hə́wan/ ‘dog’ is stressed even though the final syllable contains a full vowel [a] followed by a resonant [n], just as it does in /ʔəcím/ ‘little’. These kinds of cases indicate that the WSP as formulated by Prince (1990) does not completely accurately describe the stress assignment process in Squamish, where it is not the relative weight of a syllable *per se* that attracts stress; if it were, [an] would be heavier than [əw]. Rather, what is important for Squamish stress is the mere fact that a syllable has weight as opposed to its being weightless. Thus, a heavy (bimoraic) syllable in Squamish is no more likely to be the recipient of stress than a light (monomoraic) one, but for obvious reasons syllables with weight are to be considered over weightless syllables.

In accounting for the difference in stressability between weightless schwa and weight-bearing full vowels in Musqueam, Shaw et al (1999) propose a modified (and narrower) version of Prince's (1990) WSP, specifying that "a *Nucleus* [italics mine] with weight is prominent within a Foot" (Shaw et al 1999:135). This modified version of the WSP still is not able accurately to depict the situation in Squamish, where nuclear but weightless schwa, although ordinarily not considered for stress, is stressable in the context of an immediately following resonant consonant. Clearly, in evaluating stress-bearing potential in Squamish syllables the stress assignment process must look for weight in the syllable as a whole (or at least in its rhyme) rather than in the nucleus alone. While in Dyck (2000) I attempted to account for the role of weight in Squamish stress assignment by using an adaptation of Shaw et al's version and modifying it to "a *syllable* with weight is prominent within a foot," I now opt for the minimally revised version of Prince (1990) given in (14).

(14) WSP′: If weight, then stressed.

Whereas Prince's (1990) WSP states that stress gravitates toward heavy syllables, WSP′ states simply that stress gravitates toward syllables with weight.

Since most syllables in Squamish (as in other languages) do have weight by virtue of containing either a full vowel or a plain resonant consonant, applying the WSP′ to a disyllabic root with full moraic structure (in the form of a full vowel or a schwa–resonant sequence) in both syllables will result in the root being parsed into two degenerate feet, for example, as in (15c), which features two illicit feet, each consisting of a single light syllable.[14] To keep such clearly erroneous forms[15] from being selected as optimal, it is necessary that the FtBin-σ constraint be ranked above the WSP′. This is demonstrated by the reanalysis in (15) and (16) of disyllabic roots initially analysed in (6) and (8).

(15) t'áyaq' 'get angry'

Candidates	FtBin-σ	WSP′	FtForm=Trochee	Parse-σ
☞ a. (t'á.yaq')		*		
b. (t'a.yáq')		*	*!	
c. (t'á)(yáq')	*!			

As the tableau in (15) shows, both of the candidates in (a) and (b), which must be considered the more likely of the three candidates in terms of optimality, violate the WSP′ by failing to stress one or the other of the syllables, both potential stress bearers, while the least likely candidate, namely, (c), is the only one to obey it. This calls for the constraint ranking FtBin-σ >> WSP′. Note that there is no indication yet of a relative ranking, if any, between FtBin-σ and FtForm=Trochee on the one hand and FtForm=Trochee and the WSP′ on the other: while the trochaic form in (a) wins out over the iamb in (b), it would do so no matter which way the constraints were ordered.

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[14]A foot structure *(t'áyáq') is disallowed by definition: as a rhythmic unit a (metrical) foot cannot contain more than one strong, or prominent, syllable.

[15]It is a well-documented observation that in many languages stress tends not to fall on adjacent syllables (see, for instance, Liberman 1975, Liberman and Prince 1977, and others). In OT analyses, this tendency in languages is often dealt with by invoking a *Clash constraint; however, in the analysis here, the matter is quite straightforwardly dealt with simply by having FtBin-σ outrank the WSP′, as suggested. (The *Clash constraint is utilized in the analysis of some morphologically complex words in subsequent chapters; see also Chapter 4).

The same generally holds true in the reanalysis of /kšáwəs/ in (16), earlier analysed in (10), although the featured configuration is slightly different in that only one syllable contains a full vowel.

(16) /kšáwəs/ 'bluejay'

Candidates	FTBIN-σ	WSP′	FTFORM=TROCHEE	PARSE-σ
☞ a. (kšá.wəs)				
b. (kša.wə́s)		*!	*	
c. (kšá)(wə́s)	*!*			
d. (kšá)wəs	*!			*

In (16) the optimal candidate, namely, that in (a), wins, as it is the only candidate to obey all four constraints. Because the schwa-based final syllable contains no weight, the WSP′ is not violated by a candidate that has stress only in the first syllable.

The mixed disyllabic roots data in (7) and the subsequent discussion in this section make it clear that in Squamish syllables with moraic weight are those that contain either a full vowel or a schwa that is followed by a resonant consonant, but not schwa in any other context.[16] In the case of schwa, the presence of a following resonant clearly influences the

[16]Not only does Squamish fail to distinguish between heavy and light syllables in the sense originally intended by the WSP, but it also does not appear to make a distinction based on the relative sonority of full vowels, such as is found, for instance, in Cowichan (Bianco 1996) and Lushootseed (Urbanczyk 1996[2001]); see discussion in Chapter 4 (section 4.1). These observations notwithstanding, as pointed out in Chapter 2 (section 2.1.2), stressed vowels in Squamish tend to be lower and longer than their unstressed counterparts, presumably in an effort to enhance sonority; recall from discussion in Chapter 1 (section 1.4.4) that, universally, low vowels are considered more sonorous than mid vowels, which are more sonorous than high vowels.

ability to stress schwa. Languages differ with respect to which (classes of) segments are moraic; see, for instance, Zec (1995), who argues that resonants, but not obstruents, are moraic in Kwak'wala. Although the stress patterns observed in Squamish roots with schwa suggest that Squamish may have a similar weight difference between obstruents and resonants, there are a number of reasons to question such an analysis. For one thing, if the weight resides in the resonant, then a full-vowel–resonant sequence should have twice the weight of a schwa–resonant sequence, but there is no indication that this is so (see discussion earlier in this section). Another argument against such an analysis is that, again if the weight resides in the resonant, the resonant must be presumed to be a part of the syllable preceding it rather than the one following it (thus syllabifying as /CəR.VC/ rather than /Cə.RVC/); since word-medial consonant instantiations in Squamish are predominantly simplex (see Chapter 2, section 2.2.3.3), this would be in violation of universal constraints on wellformed syllables, which tend to maximize onsets and ban codas. Moreover, the fact that a full-vowel–resonant sequence apparently is equal in weight to a schwa–resonant sequence suggests that the intervocalic resonant may be syllabified differently in CəRVC than in CARVC (that is, as /CəR.VC/ in the former case, but as /CA.RVC/ in the latter). The questions raised here are further addressed in Chapter 4, where a straightforward solution is proposed to the problem. In the meantime, for the remainder of the analysis of stress in roots, I simply assume that a schwa-based syllable has weight in the environment of a following plain resonant, but not in that of an obstruent or a glottalized resonant.

The tableaux that follow demonstrate the differences found in the stress patterns of mixed disyllabic roots. First, (17) and (18) show why roots like /kʷə́laš/ ‘shoot’, which feature a penultimate schwa followed by a resonant, surface with penultimate stress even though the root contains a full vowel in the final syllable, while those like /səpíq/ ‘yellow salmonberry’, which feature a penultimate schwa followed by an obstruent, surface with exceptional stress on the final full-vowel syllable.

(17) /səpíq/ ‘yellow salmonberry’

Candidates	FTBIN-σ	WSP′	FTFORM=TROCHEE	PARSE-σ
a. (sə́.piq)		*!		
☞ b. (sə.píq)			*	
c. (sə́)(píq)	*!*			
d. sə(píq)	*!			*

The tableau in (17) shows that in order to rule out the binarity-obeying candidate with penultimate stress in (a), the WSP′ constraint must outrank FTFORM=TROCHEE. Thus, the crucial ranking order FTBIN-σ >> WSP′ >> FTFORM=TROCHEE can now be established; the relative positioning of PARSE-σ, however, is still not clear.

In (18) the only two candidates to obey the high-ranking FTBIN-σ, namely, (a) and (b), both violate the WSP′ constraint by placing stress on only one of two potential sites for stress, assuming that syllables containing full vowels and plain resonants have weight; as a result, candidate (a) wins because it alone obeys FTFORM=TROCHEE. Note that in the outputs of (18a, b), the syllable boundary is arbitrarily made to follow the resonant, thus leaving the final syllable onsetless. This is a temporary means used to differentiate between the stressability of schwa in the environment of a following resonant, and its unstressability in the environment of a following obstruent. A formal analysis will follow in Chapter 4.

(18) /kʷə́laš/ 'shoot'

Candidates	FTBIN-σ	WSP′	FTFORM=TROCHEE	PARSE-σ
☞ a. (kʷə́l.aš)		*		
b. (kʷəl.áš)		*	*!	
c. (kʷə́l)(áš)	*!*			
d. kʷə(láš)	*!			*

Finally, given the assumption that although schwa is stressable when it precedes a plain resonant, it is not stressable in the environment of a following glottalized resonant, the occurrence of final stress in /həwʔít/ 'rat' can be analysed as in (19), where candidate (b) wins in spite of violations against FTFORM=TROCHEE because it alone adheres to the higher-ranked WSP′ constraint.

(19) /həwʔít/ 'rat'

Candidates	FTBIN-σ	WSP′	FTFORM=TROCHEE
a. (hə́wʔit)		*!	
☞ b. (həwʔít)			*

3.1.1.3. Schwa-based disyllabic roots

Only a few examples were found in the corpus of clearly monomorphemic words whose syllabic nuclei contained no full vowels but only schwa. Disyllabic roots with two schwas are listed in (20).

(20) Disyllabic roots with two schwas

a. Stress on penultimate syllable

wə́x̣əs[17]	'frog'	x̣ə́təh[18]	'far'	t'ə́ləm	'wild cherry'

b. Stress on final syllable

yəqə́y	'to creep'	ƛ'əʔə́nq[19]	'potlatch'

Although there are not really a sufficient number of examples in the corpus to make a firm claim with respect to stress in disyllabic roots with schwa as the only vocoid, stress in such roots appears to be penultimate when neither of the two schwas is followed by a resonant, as in /wə́x̣əs/ 'frog', but when one of the syllables in the root contains a post-

[17]According to recent fieldwork by Leora Bar-el and Linda Tamburri Watt (see, for instance, Bar-el and Watt 1998), stress in this word is on the initial, or penultimate, syllable, as given here and in (23a), but it should be noted that Kuipers (1967) shows the word as having final stress, thus, as /wəx̣ə́s/.

[18]Kuipers (1967) has /x̣ə́ta/; however, this is likely a surface form deriving from underlying /x̣ə́təh/, since typically /əh/ → [a] in Squamish (see Chapter 2, section 2.1.2.3).

[19]Kuipers (1967) also gives the alternate form /ƛ'ə́nq/; again, the preferred form (that is, the disyllabic /ƛ'əʔə́nq/) demonstrates the proclivity to disyllabicity in nouns, as opposed to verbs, which tend to have a monosyllabic (predominantly CVC) shape (see section 2.2.6 of Chapter 2)..

schwa resonant, as is the case in /yəqə́y/ 'to creep' and /ɬəʔə́nq/ 'potlatch' (but not in /x̣ə́təh[20]), that syllable will surface with stress, even if it is the final syllable in the root.

The constraints posited in the previous sections are able to account straightforwardly for the examples of schwa-based roots in (20a, b), as the tableaux in (21-22) demonstrate.

(21) /wə́x̣əs/ 'frog'

Candidates	FTBIN-σ	WSP′	FTFORM=TROCHEE
☞ a. (wə́x̣əs)			
b. (wəx̣ə́s)			*!

(22) /yəqə́y/ 'to creep'

Candidates	FTBIN-σ	WSP′	FTFORM=TROCHEE
a. (yə́qəy)		*!	
☞ b. (yəqə́y)			*

As the tableaux in (21) and (22) show, only two constraints, namely, the WSP′ and FTFORM=TROCHEE, are called into play in analysing stress in disyllabic schwa-based roots. The analysis in (22) is clearly a matter of the former constraint outranking the latter; in other words, if there is a syllable with weight, that syllable will get the stress. In the case of (21), where neither candidate has weight, the WSP′ is not called into play; consequently, FTFORM=TROCHEE rules that the form with penultimate stress will win.

[20]Recall from discussion in section 2.1.1.2 of Chapter 2 that, although classified by Kuipers (1967) as a resonant, /h/ is unlike other resonants in Squamish in that it does not attract stress to its syllable.

It is a matter of note that Bar-el and Watt (1998:4) give rather more examples of schwa-only roots than are found in (20), but it should be remarked that of the six examples they list only three are clearly monomorphemic. Of these, [k^wə́ləš] ‘shoot’ (cf. Kuipers’ /k^wə́laš/) is in all probability a surface form resulting from unstressed full-vowel reduction, and as such it ought to be classed with mixed roots of type /əA/ rather than with schwa-only roots. Note that the analysis here is able to account for Kuipers’ version of this root, as well as for Bar-el and Watt’s [k^wə́ləš], since in both cases the presence of the intervocalic resonant /l/ attracts stress to the penultimate syllable.

Several of the schwa-based disyllabic “roots” mentioned in Bar-el and Watt (1998) are actually morphologically-complex forms. The first of these forms, [sə́səlq] ‘be sad’, is the reduplicated stem /sə́+√səlq/, for which stress is as expected, since reduplicated schwa-based roots predictably surface with stress on the reduplicant. The second form, [hə́mʔtən] (transcribed by Kuipers as /hə́mʔtn/) ‘blanket’, is a combination of the variable root /√hamʔ, √həmʔ/ ‘be covered’ and /=tn/ ‘implement’, a lexical suffix which never receives stress in Kuipers but which appears on at least one occasion with secondary, though never primary, stress in Watt (1999); since the suffix is not available for primary stress, word stress will predictably fall on the root as given.

3.1.2. Trisyllabic roots

The fact that disyllabic roots tend to exhibit penultimate stress does not in itself prove that Squamish assigns stress to penultimate syllables; it could also mean that stress falls on the initial syllable of a word or merely that it does not fall on the ultima. To accurately gauge whether Squamish stress is indeed penultimate, it is necessary to look at roots that are more than two syllables in length. Unfortunately, there is a paucity in the Squamish corpus of words that are clearly monomorphemic yet consist of three or more syllables.[21] An examination of the data shows that, overall, only a small majority (55%) of trisyllabic roots surface with stress on the penultimate syllable. This percentage, however, increases to 82 percent when the nucleus of the penultimate syllable contains a full vowel.

A sampling of trisyllabic roots containing three full vowels appears in (23) while examples of mixed trisyllabic roots are listed in (24). Trisyllabic roots containing no full vowels were not found in the corpus. The roots in (23) and (24) are further categorized by whether stress falls on the initial, penultimate, or final syllable.[22]

(23) Trisyllabic roots with three full vowels

a. Stress on penultimate syllable

ʔip’áq’^{w}aɬ	‘be afraid’	q^{w}uláyus	‘high tide’	manác’i	‘drum’
ʔiwʔáyti	‘maybe’	q^{w}anʔímač	‘mosquito’	sɬayʔámin	[geog. place name]

b. Stress on antepenultimate syllable

yásawʔi	[a type of tree]	sínuɬqay	[name of mythological two-headed serpent]
slílʔutuɬ	‘Burrard Inlet’	sʔíx^{w}iwat	‘to be jumping (ab. fish)’

---

[21] As already mentioned, monomorphemic words containing four or more syllables were not found, and, in truth, at least some of the trisyllabic words listed here and in Kuipers (where trisyllabic roots constitute approximately two percent of free roots) are questionably monomorphemic.

[22] No examples were found of full-vowel-only trisyllabic roots with final stress.

(24) Trisyllabic mixed roots

a. Stress on penultimate syllable

i. p'əʔúc'us[23] 'cradle' ƛ'əʔímin 'sinew' yəx̣íʔu 'use fire in hunting'
ʔaɬáwləqʷ 'big raft' xʷalítən 'white person'
sʔac'ámʔəs 'women's shoulder blanket'

ii. yəx̣ʷə́laʔ 'eagle'

b. Stress on antepenultimate syllable
mə́lalus raccoon nə́wuk'ʷa 'coffin' stə́waqin 'graveyard, corpse'

c. Stress on final syllable
smək'ʷəʔál 'grave, dead man's cache'

As with disyllabic roots, roots consisting of three syllables tend to surface with stress on the penultimate syllable if that syllable contains a full vowel, as the examples in (23a) and (24a.i) show. The case for penultimate stress is strengthened by the consideration that the monomorphemic status of some if not all of the examples in (23b) and (24b), which list both full-vowel and mixed trisyllabic roots with stress on the antepenultimate syllable, is questionable at best. For instance, in (23b) /yásawʔi/ [a type of tree] almost certainly contains the reduced form of the suffix /=ay(ʔ)/ 'bush, tree', and it is not inconceivable that /sʔíxʷiwat/ 'to be jumping (ab. fish)' is a lexicalized complex containing the transitive /-t/ suffix. In both of these cases, initial stress would then be fully predictable (that is, when morphological factors are taken into consideration). As for /sínuɬqay/ [name of mythological two-headed serpent], this word indisputably contains a form of /√ʔə́ɬqayʔ/ 'snake', and is quite possibly a compound consisting of /√ʔə́ɬqayʔ/ and a second root /√sin/. Although

[23] In addition to this form, Kuipers (1967) lists the alternate form /p'úhc'us/.

/√sin/ is unattested as a free morpheme, it is found in a number of transitive and intransitive forms; examples are /√sín-it/ ‘move (s.t. from one place to another); tr.’ and /√sín=šn-am/ ‘move over one’s feet; itr.’. More probably, /sin/ is a combination of the nominalizer /s-/ and /√ʔína, ʔín-/ ‘the one, the other’, found, for instance, in /s-√ʔína-qa/ ‘one of a pair’. Finally, /slílʔutuɬ/ ‘Burrard Inlet’ may well have a connection with /√slil/ ‘bunch of native blankets, as well as probably containing a suffix /=uɬ/ ‘belonging to; connected with’.

Similarly, the morphemic status of at least two of the examples in (24b) can be called into question. While Kuipers lists /mə́lalus/ ‘raccoon’ and /stə́waqin/ ‘graveyard, corpse’ as roots, he suggests they may in fact be combinations of /√mal, məl/ ‘round’ and the *l*-form of the lexical suffix /=ayus/ ‘eye’ in the first instance, and of /√st’ə́waq’^{w}/ ‘mud which is burnt and used as white paint’ and /=qin/ ‘head, hair’ in the second. If these forms are morphologically complex as suggested, then initial stress is predictable at least for /stə́waqin/ (< √st’ə́waq’^{w}=qin), as the now disyllabic root has stress on a penultimate syllable with weight, and the argument in favour of penultimate stress in roots is thus strengthened.

The two examples in the corpus of trisyllabic roots with two schwas, namely, those in (24a.ii; 24c), show varying stress patterns, with stress falling on the penultimate syllable in /yəx̣^{w}ə́laʔ/ ‘eagle’, where penultimate schwa precedes a resonant, and on the final syllable in /smək’^{w}əʔál/ ‘grave, dead man’s cache’, where both the initial and penultimate schwas are followed by obstruents. In both cases, however, stress is predictable under the analysis here: in /yəx̣ʷə́laʔ/ penultimate schwa is stressed before a resonant consonant and in /sməkʼʷəʔál/ the final syllable receives stress by virtue of the fact that it is the only syllable containing weight. The last-mentioned is the only trisyllabic root in the corpus with stress on the final syllable.

Since feet in Squamish are binary at the syllabic level, the analysis of disyllabic roots in the earlier sections of this chapter did not require that they be identified as left- or right-aligned to the prosodic word boundary. In the analysis of trisyllabic roots, however, it becomes necessary to pinpoint just which of the two edges of the root must be aligned with a foot edge. Given that stress is penultimate and feet are binary trochees, as posited here, the point of alignment must be at the right edge of the root.[24] The wording of the constraint in (25) comes from Cohn and McCarthy's (1994) analysis of Indonesian.

(25) ALIGN-RT-FT[25]
Align (Root, R, Foot, R)
The right edge of every root coincides with the right edge of some foot.

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[24]The analysis of morphologically complex forms in Chapters 5 through 7 will show that root-foot alignment is best served by means of a constraint ROOT=FOOT, and that a constraint such as that stated in (25) is relevant to the prosodic word (rather than prosodic root) edge.

[25]This constraint constitutes a specific application of McCarthy and Prince's (1993b) generalized alignment schema stated below:

(i) Generalized Alignment
Align (Cat_1, $Edge_1$, Cat_2, $Edge_2$) $=_{def}$
$\forall Cat_1 \exists Cat_2$ such that $Edge_1$ of Cat_1 and $Edge_2$ of Cat_2 coincide.
Where $Cat_1, Cat_2 \in$ ProsCat $\cup$ GramCat
$Edge_1, Edge_2 \in$ {Right, Left}

Included in GramCat are grammatical categories such as Word, Stem, Root, Affix, etc., and included in ProsCat are prosodic categories such as PrWd, Foot, Syllable, Mora, etc.

Aligning the right edges of foot and root ensures that binary trochees are counted from the right edge of the prosodic word, and thus that stress will surface, as it does in Squamish, on the penultimate syllable of the word.

The tableau in (26) demonstrates the OT analysis of trisyllabic roots with three full vowels.

(26) /q^w^ uláyus/ 'high tide'

	Candidates	FtBin -σ	WSP′	FtForm= Trochee	Align- Rt-Ft	Parse -σ
	a. (qʷú.la)yus		**		*!	*
	b. (qʷu.lá)yus		**	*!	*	*
☞	c. qʷu(lá.yus)		**			*
	d. qʷu(la.yús)		**	*!		*
	e. (qʷú.la)(yús)	*!	*			
	f. (qʷu)(lá.yus)	*!	**	*		
	g. (qʷuláyus)	*!	**	*		

In (26), candidates (e) through (g) are ruled out by the high-ranking FtBin-σ, (b) and (d) by FtForm=Trochee, and (a) by Align-Rt-Ft. This leaves candidate (c) as the winner. It is now clear that the partial ranking order FtBin-σ >> Parse-σ must obtain in order to prevent one of the fully parsed but multiply stressed candidates in (e-g) from being selected as optimal forms: a reverse ranking of these constraints would eliminate candidate (c), which has the correct output form, along with all other partially parsed candidates. The place of Align-Rt-Ft in the constraint rankings is not established in this analysis.

The analysis of trisyllabic mixed roots, examples of which are found in (24), is demonstrated in tableaux (27) through (29), beginning in (27) with a depiction of the root type /əÁA/, here exemplified by /yəx̣íʔu/ 'use fire in hunting'.

(27) /yəx̣íʔu/ 'use fire in hunting'

Candidates		FTBIN -σ	WSP′	FTFORM= TROCHEE	ALIGN-RT-FT	PARSE -σ
	a. (yə.x̣í)ʔu		*	*!	*	*
	b. (yə́.x̣i)ʔu		**!		*	*
☞	c. yə(x̣í.ʔu)		*			*
	d. yə(x̣i.ʔú)		*	*!		*
	e. (yə.x̣í.ʔú)	*!		*		

In (27), candidate (e) is ruled out for disobeying FTBIN-σ, candidate (b) because it incurs two infractions against the WSP′ (compared to one infraction for the rest of the candidates in the list). Of the three remaining candidates, both (a) and (d) are ruled out by FTFORM=TROCHEE, and (c) wins.

Analyses for mixed trisyllabic roots with two schwas and a full vowel (types /əəÁ/ and /əə́A/) are represented by (28) and (29); of these, the former depicts the root /smək'ʷəʔál/ 'grave, dead man's cache', which stresses a final full vowel in the absence of a resonant in either the initial or the penultimate schwa-based syllable, while the latter depicts /yəx̣ʷə́laʔ/ 'eagle', which stresses penultimate schwa in the environment of an immediately following resonant even though the final syllable contains a full vowel. Recall from discussion in

Chapter 2 (see section 2.1.1, 2.1.2.2, and, especially, fn. 4 of that chapter) that the glottal [ʔ] is analysed as a stop, and not as a resonant.

(28) /sməkʼʷəʔál/ 'grave, dead man's cache'

Candidates	FTBIN -σ	WSP′	FTFORM= TROCHEE	ALIGN-RT-FT	PARSE -σ
a. (smə́kʼʷə)(ʔál)	*!			*	
b. sməkʼʷəʔ(ál)	*!				**
☞ c. smə(kʼʷəʔál)			*		*
d. smə(kʼʷə́ʔal)		*!			*
e. (smə́kʼʷə)ʔal		*!		*	*
f. (sməkʼʷə́)ʔal		*!	*	*	*

In the analysis of roots like /sməkʼʷəʔál/, depicted in (28), the high-ranking FTBIN-σ and WSP′ constraints straightforwardly rule out all but the correct candidate (c), which has no choice but to stress the final syllable, as this is the only syllable with weight.

(29) /yəx̣ʷə́laʔ/ 'eagle'

Candidates	FTBIN -σ	WSP′	FTFORM= TROCHEE	ALIGN-RT-FT	PARSE -σ
a. (yəx̣ʷə́l)aʔ		*	*!	*	*
b. (yə́x̣ʷəl)aʔ		**!		*	*
☞ c. yə(x̣ʷə́laʔ)		*			*
d. yə(x̣ʷəláʔ)		*	*!		*

In (29), candidate (b) is not an option as it violates the WSP′ twice. Of the remaining candidates, only (c) obeys both FTFORM=TROCHEE and ALIGN-RT-FT, and consequently, it comes out the winner.

3.1.3. Section summary

The examination of stress in section 3.1 has shown that, all things being equal, Squamish prefers to stress penultimate syllables, at least at the root level. In the case of disyllabic roots, which constitute the vast majority of polysyllabic roots in Squamish, the table in (1) and ensuing discussion aptly demonstrated that stress was penultimate in more than three quarters of such roots. Moreover, discussion in sections 3.1.1.1 and 3.1.1.2 showed that stress in the majority of cases of disyllabic roots which exceptionally stressed the final rather than the penultimate syllable was predictable based on the environment in which the penultimate nucleus found itself; the findings discussed in those sections are summarized here in (30).

(30) Disyllabic roots with stress on final full vowel

Root type	**CVRʔÁ(C)**	**CəKÁC**	**Borrowed**	**Anomalous**	**Total**
AA	10	n/a	6	2	**18**
əA	6	16	1	1	**24**
Total	**16**	**16**	**7**	**3**	**42**

The table in (30) shows that of the 42 disyllabic roots in the corpus that fail to place stress on the penultimate nucleus of the root in favour of stressing a final full vowel, a total of 32, or just over 76 percent, contain either a post-nucleic glottalized resonant (CVRʔÁ(C) type roots) or a schwa–obstruent sequence (CəKÁC type roots) in the penultimate syllable.

In fact, when the seven loanwords are factored out,[26] this explanation is able to account for 91 percent of disyllabic roots with exceptional final stress. This suggests not only that glottalized resonants pattern with obstruents rather than with plain resonants in that schwa-based syllables in which they appear are not visible to stress processes, but that their presence in any syllable (whether it contains a full vowel or schwa) inhibits its ability to attract stress (see Zec 1995 for a similar finding for Kwak'wala). It should be noted, however, that in Squamish this proclivity is clearer in roots where the penultimate syllable contains schwa followed by a glottalized resonant; a penultimate full vowel in the same situation is much more likely than schwa to surface with stress.

The finding that stress falls predictably on the penultimate syllables of disyllabic roots is strengthened by the finding, in section 3.1.2, that the majority of trisyllabic roots also surface with penultimate stress. In fact, in only one case did stress fall on the final syllable of a trisyllabic root, and the instances of trisyllabic "roots" with initial (or antepenultimate) stress were with few exceptions shown to be in all likelihood morphologically complex. Thus the case for penultimate stress in Squamish roots is clear. Whether this pattern of penultimate stress holds for morphologically complex forms will be examined in section 3.2.

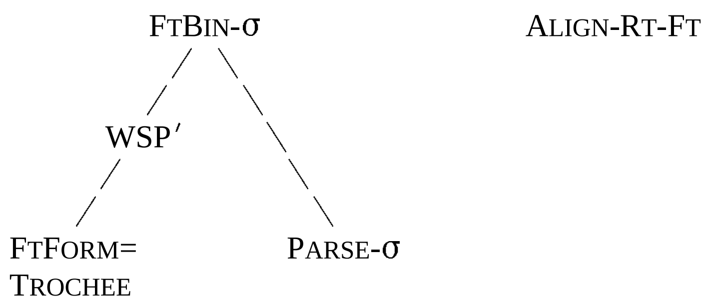
This section on stress in Squamish roots has, moreover, brought to light an important clue to Squamish stress assignment, namely, that a general prohibition against stressing schwa is lifted when schwa is immediately followed by a plain resonant consonant; in fact,

[26]Loanwords with final stress in Squamish tend to have their origin in either French or Chinook Jargon, both of which stress the final syllables of words. Recall that Squamish borrowings typically reflect the stress patterns found in the language of origin.

a penultimate syllable containing a schwa–resonant sequence is just as likely to receive stress as is a penultimate syllable with a full-vowel nucleus. The question of what accounts for this is further pursued in Chapter 4.

The OT analyses of Squamish roots in section 3.1 demonstrate that the following constraints and rankings are necessary to account for stress in Squamish roots:

(31)



While a ranking order is definitely indicated for FtBin-σ over the WSP′ over FtForm=Trochee, all three of which are required in the analysis of disyllabic as well as trisyllabic roots, and while FtBin-σ also clearly outranks Parse-σ, the relative ranking of Parse-σ with respect to FtForm=Trochee and the WSP′ is not certain; as well, the place of Align-Rt-Ft in the constraint rankings has not been established.

3.2. A phonological analysis of stress in polymorphemic words falls short

Section 3.1 clearly established the tendency for penultimate stress in Squamish roots. An examination of polymorphemic words consisting of fewer than four syllables[27] shows, at

[27]Polymorphemic words consisting of four or more syllables tend to surface with multiple stress. Since the present purpose is merely to discover whether the observed tendency for stress to surface on the penultimate syllables of roots extends to Squamish words in general, the discussion here will be limited to words that are not complicated by this added factor. The subject of multiple stress, which tends to surface on alternating syllables of morphologically complex words, will be addressed in Chapter 4.

least at first glance, that such words also frequently surface with (some degree of) stress on the penultimate syllable, whether that syllable constitutes or is part of a prefix, root, or suffix; indeed, Demers and Horn (1978) held that both roots and morphologically complex Squamish words were analysable in strictly phonological terms. The preliminary examination of singly-stressed polymorphemic words in this section will show, however, that phonological factors alone are unable to account for stress in approximately half of the words examined; therefore, other factors must be involved.

In the subsections that follow, the occurrence of stress in two- to four-syllable words consisting of prefix–root, root–suffix, and prefix–root–suffix combinations is examined individually in sections 3.2.1, 3.2.2, and 3.2.3, respectively. In each of these subsections, data sets are presented that are exemplary of the category; individual examples in each set are then evaluated in terms of the phonological theory of stress outlined in section 3.1 of this chapter. To facilitate comparison of stress in the morphologically complex data with that in roots (in section 3.1), the exemplary data in each section are subclassified in terms of the number of syllables contained in a given word as well as in terms of which syllable bears the word stress; for this exercise, a string of segments is deemed a syllable if in the (surface) form given it contains either (i) a full vowel or (ii) a resonant preceded either by schwa or by a tautomorphemic consonant (which, recall, renders the resonant syllabic).

3.2.1. Prefix–root combinations

The data in this section exemplify morphological concatenations consisting of one or more prefixes and a root morpheme. For ease of explication, combinations exhibiting penultimate stress (32) and those exhibiting final (33) and antepenultimate (34) stress are presented and discussed separately. A checkmark (✓) or an X (✗) beside a word indicates whether or not that word conforms with the prediction of the phonological analysis with regard to stress.

(32) Penultimate stress in prefix–root combinations

a. Disyllabic words

✓	s-txʷ-ná+√namʔ	'be gone' (txʷ- 'direction')
✓	p'á+√p'ač'	'be very hot'
✗	šəm+√šám	'run aground'
✓	t'ə́m+√t'əm	'snowbirds'
✗	s-x̣ə́+√x̣ən	'frost'
✓	s-cə́q+√cəq	'trees, logs'

b. Trisyllabic words

✓	kʷəp+√kʷúpic	'elder siblings'
✓	ɬəɬ-√sp'úƛ'am	'to smoke' (ɬəɬ- 'to take in; ingest')
✓	ʔəs-č'ə́q+√č'əq	'dirty' (ʔəs- 'one which X-es')

The data in (32) show that the phonological analysis of stress outlined in section 3.1 of this chapter is able to account for the actual occurrence of stress in all but two of the examples given. Incorrect predictions are made in the case of /šəmšám/, where the predicted form is */šə́mšam/, with penultimate stress, as the penultimate syllable has weight in the form of a post-nucleic resonant, and /sx̣ə́x̣ən/, where the predicted form is */sx̣əx̣ə́n/, with final stress, as only the final syllable has weight.

In prefix–root combinations with stress on the final syllable, phonological stress makes the correct predictions approximately half of the time, as the data listed in (33) show.

(33) Final stress in prefix–root combinations

a. Disyllabic words

✓	təc+√tíc	‘skinny’
✓	nəx^{w}-√táʔ	‘(go) by way of’ (nəx^{w}- ‘locative’)
✓	nəx^{w}-s-√x̣ə́yx̣	‘warrior’
✗	ti-√lámʔ	‘build a house’ (ti- ‘to make, build, produce’)
✗	ti-√mə́nʔ	‘produce offspring’
✓	ʔəs-t’á+√t’q’	‘lying across’
✗	ʔəs-x^{w}ə́+√x^{w}k^{w}	‘used’

b. Trisyllabic words

✓	ɬəɬ-√səplín	‘eat bread’
✗	s-təq+√taqíw	‘horses’
✓	ʔəs-c’əx^{w}+√c’íx^{w}	‘helpful’
✓	tut-nəx^{w}-√č’ít	‘a little closer’

Mispredictions for the words in (33) fall generally into two categories. In the first category, of which the disyllabic /tilámʔ/ and /timə́nʔ/ and the trisyllabic /stəqtaqíw/ are examples, the analysis predicts that default (penultimate) stress will apply, as the penultimate syllable in all three cases contains a full vowel; thus, the expected forms are */tílamʔ/, */tímənʔ/, and */stəqtáqiw/, respectively, all of which are erroneous. In the second category, exemplified by the disyllabic /ʔəsx^{w}ə́x^{w}k^{w}/, a schwa-based word with no moraic elements, the analysis again predicts penultimate stress, thus, */ʔə́sx^{w}əx^{w}k^{w}/; instead, stress falls on the final schwa.

Finally, the data in (34) exemplify trisyllabic morphologically complex words with antepenultimate stress.

(34) Antepenultimate stress in prefix–root combinations
Trisyllabic words

✗	cí+√cawʔin	'small type of cohoe salmon'
✗	s-ní+√nix̣^{w}ił	'small canoe'

In (34), the phonological analysis of stress advocated in section 3.1 clearly makes the wrong prediction for /snínix^{w}ił/, in which stress is expected to be penultimate, given that the penultimate syllable contains a full vowel; thus, the analysis predicts the incorrect form */sniníx^{w}ił/. In the case of /cícawʔin/, one would probably expect stress to fall on the full vowel in the penultimate syllable, thus yielding the erroneous */cicáwʔin/, although the presence in the penult of a post-vocalic glottalized resonant, which has been demonstrated to exhibit a tendency to inhibit stress in the vocalic element immediately preceding it even if it is a full vowel,[28] makes this case less straightforward. However, even if the glottalized resonant were responsible for nonpenultimate stress in this case, the preferred alternative would be to stress the final rather than the antepenultimate syllable, given right-alignment of foot and root.

3.2.2. Root–suffix combinations

In this section morphological concatenations consisting of a root and one or more suffixes are presented and discussed with respect to whether the stress patterns exhibited in such forms can be accounted for in strictly phonological terms. Combinations with penultimate

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[28]Although stress is clearly inhibited in syllables where the vocalic element preceding the glottalized resonant is schwa (discussed in section 3.1.1.2), the case is less clear when the vocalic element consists of a full vowel; see the table in (30) and discussion surrounding it in section 3.1.3.

stress are given in (35), while those with final and antepenultimate stress are listed in (36) and (37), respectively.

In the main, the phonological stress theory is able to account for the outcome of stress for the disyllabic and trisyllabic root–suffix combinations listed in (35); in fact, it makes the incorrect prediction for only one of the examples given, namely, /qə́qwiɬ/, where stress is expected to fall on the final syllable, yielding */qəqwíɬ/, as the final syllable contains the only moraic element in the word.

(35) Penultimate stress in root–suffix combinations

a. Disyllabic words

✓	√p'íč=ač	'get one's hand caught'
✓	n-√c'úys=us	'crazy-faced'
✓	√t'ám-at	'to guess; tr.'
✓	√č'áw-nəx^{w}	'to have been of assistance; tr.'
✗	√qə́q=wiɬ	'brand-new canoe'

b. Trisyllabic words

✓	√qi=yúnəx^{w}	'bad waves'
✓	√čmx̣=áyus	'have one's eyes closed up with pitch'
✓	√x̣əh-ám=ayʔɬ	'have one's child crying'

In root–suffix combinations which exhibit final stress, for which exemplary data are listed in (36), the phonological stress theory espoused here for the analysis of roots makes the wrong prediction of stress in virtually every case. As the forms in question all have weight in the penultimate syllable, they would be expected to surface with penultimate stress, yielding the erroneous forms */x̣ə́wɬ'ač/, */c'ə́hus/, */ɬ'ánqawʔtx^{w}/, */č'əsp'íus/, */st'aq'íc'awʔtx^{w}/, and */staqíwulɬ/, instead of which they exhibit final stress.

(36) Final stress in root–suffix combinations

a. Disyllabic words

✗	√x̣əwƛ’=áč	‘break one’s arm’
✗	√c’əh=ús	‘get hit in the face’
✓	√t’əq’ʷ-mínʔ	‘broken-off half’
✗	√ƛ’anq=áwʔtxʷ	‘potlatch house’

b. Trisyllabic words

✗	√č’əsp’i=ús	‘ugly-faced’
✗	s-√t’aq’ic’=áwʔtxʷ	‘log house’
✗	s-√taqiw=úlɬ	‘colt’

In the three- and four-syllable root–suffix combinations listed in (37), stress unexpectedly shows up on the antepenultimate syllable, contrary to the predictions of the phonological stress. Under a strictly phonological analysis the words in question would be expected to exhibit penultimate stress, thus yielding */x̣č’itáx̣an/, */ciqíʔəqʷ/, */cəxʷíʔəqʷ/, */ʔəlínit/, */halítən/, and */xʷalitə́nuɬ/, as all contain weight in the penultimate syllable.

(37) Antepenultimate stress in root–suffix combinations

a. Trisyllabic words

✗	x̣-√č’ít=ax̣an	‘the near side’
✗	√cíq=iʔəqʷ	‘get stabbed on the top of the head’
✗	√cə́xʷ=iʔəqʷ	‘get hit on the head’
✗	√ʔə́li-nit	‘dream about; tr.’
✗	√háli=tən	‘chisel’

b. Four-syllable words

✗	√xʷalítn=uɬ	‘white man’s (adj.)’

3.2.3. Prefix–root–suffix combinations

In this section morphologically complex words consisting of a root and one or more prefixes and one or more suffixes are analysed in order to ascertain whether the phonological account of stress presented in section 3.1 of this chapter can adequately account for stress in such forms. Examples of combinations with penultimate stress are given in (38), while those with final and antepenultimate stress are listed in (39) and (40), respectively.

(38) Penultimate stress in prefix–root–suffix combinations

a. Trisyllabic words

✓	t’əq’+√t’áq’=ač	‘six (persons)’
✗	nəx^{w}-√yə́mʔ=tən	‘belt’
✓?	nəx^{w}-√níwʔ-it	‘teach, instruct, advise; tr.’ (also, /nəx^{w}-√nəwʔ-ít/)

b. Four-syllable words

✓	x^{w}ə+√x^{w}əpsín=ayʔ	‘cascara’
✓	nəx^{w}-√yuk^{w}=áʔmin	‘what belongs to a stingy person’
✓	nəx^{w}-√niwʔ=íaɬ	‘teach, instruct a child’
✓	nəx^{w}-√nəwʔ=íws=tən	‘container, box, trunk’

In the prefix–root–suffix combinations listed in (38), penultimate stress is correctly predicted with one (clear) exception, namely, /nəx^{w}yə́mʔtən/, for which the analysis predicts final stress, yielding */nəx^{w}yəmʔtə́n/, as the final syllable is the only one in the word that contains weight (recall that glottalized resonants do not carry weight); in contrast, stress is permitted in the penult of /nəx^{w}níwʔit/, which also has a postvocalic glottalized resonant, because the syllable contains a full vowel.

For the forms listed in (39), which are exemplary of prefix–root–suffix combinations with final stress, a strictly phonological account of stress makes the wrong predictions for /sisilíws/ and /qəʔqiʔíʔ/, which are expected to surface with penultimate stress, thus yielding */sisíliws/ and */qəʔqíʔiʔ/, respectively, as the penultimate syllable in both cases contains weight.

(39) Final stress in prefix–root–suffix combinations

a. Trisyllabic words

✓?	minʔ+√minʔ=úlɬ	‘young of human or animal’
✗	si+√sil=íws	‘become afraid’
✗	qəʔ+√qiʔ-íʔ	‘become soft’
✓	ʔəs-t’əx̣+√t’x̣=áčx^w	‘many-limbed, branchy’
✓	nəx^w-√nəwʔ-ít/	‘teach, instruct, advise; tr.’ (also, /nəx^w-√níwʔ-it)

The prefix–root–suffix combinations with antepenultimate stress listed in (40) fail to conform to predictions made by a strictly phonological analysis of stress. In all cases the penultimate syllable contains weight and stress would thus be predicted to fall on that syllable, yielding */hihíqi/, */hihílit/, */p’ip’ík^w(w)iɬ/, */nq^{w}iq^{w}ístn/, */ʔip’aq’^{w}áɬnit/, */ʔlʔəlínit/ and */tutsinítsut/; instead, it falls on the antepenultimate syllable.

(40) Antepenultimate stress in prefix–root–suffix combinations

Trisyllabic words

✗	hí+√hiq-i	‘go under’
✗	hí+√hil-it	‘roll; tr. (e.g., a tree)’
✗	p’í+√p’ik^w=(w)iɬ	‘shove a toy canoe into the water’
✗	n+q^{w}í+√q^{w}is=tən	‘small cooking-pot’

b. Four-syllable words

✗	ʔi-√p’áq’^{w}aɬ-nit	‘get frightened of; tr.’
✗	ʔl+√ʔə́li-nit	‘dream about; tr.’
✗	tut-√sín-it-sut	‘move over a little’

3.2.4. Section summary

The various subsections of section 3.2 show that while the default phonological analysis of stress utilized for roots is frequently able to account for stress in morphological complex words, there are numerous instances where it fails to do so. The individual findings of the last three subsections are here summarized.

The results of the exercise of matching predicted to actual stress patterns in the data presented in those sections show that just under half of the 60 concatenations evaluated fail to conform to the expected pattern. Of the forms that yielded errors in prediction, the vast majority (23 of 27, or 85%) failed to stress a penultimate syllable with weight, instead stressing either the final (in 9 cases, 3 of which are disyllabic) or the antepenultimate (in 14 cases) syllable; in words consisting of three or more syllables (of which there are 20), stress fell on the antepenult in 14 cases and on the ultima in 6 cases. In addition, one word with no moraic elements, namely /ʔəs-x^{w}ə́+√x^{w}k^{w}/, unexpectedly stressed the final rather than the penultimate schwa.

In contrast, only three of the 27 mishits unexpectedly placed stress on a penultimate syllable without weight; the examples in questions are /s-x̣ə́+√x̣ən/, /√qə́q=wiɬ/, and /nəx^{w}-√yə́mʔ=tən/; in each case the presence of weight in the final syllable (and only in the final syllable) predicts that these words should surface with final stress.

The fact that the phonological account of stress in Squamish roots presented in section 3.1 of this chapter does not succeed in accounting for stress in approximately half of singly-stressed polymorphemic words does not in any way diminish the validity of that analysis for the way stress patterns in Squamish roots. However, as I show in the chapters that follow, the outcome of stress in the larger word is dominated by a combination of morphological and prosodic factors; especially, morphological accent and prosodic domains play a strong role at this level of analysis.

Chapter 4

On weight, sonority, and syllabicity

4.0. Introduction

The analysis of stress in Squamish roots in Chapter 3 showed that, everything being equal, stress prefers to fall on the penultimate syllable of the root. However, stress will surface on the penult only if it contains weight, that is, if it includes either a full vowel or a schwa followed by a resonant consonant. It was argued in Chapter 3 that Squamish schwa itself is not moraic: although it is stressable in the context of a following resonant, it is not when an obstruent follows. Do resonants and obstruents differ in moraic status?

Earlier, the exploration of basic syllable structure in Chapter 2 suggested that the canonical syllable shape for Squamish consists of a simple CV pattern. This indicates that coda consonants are generally prohibited, even though roots (and words) in Squamish are virtually always consonant-final. However, the fact that schwa, which has no weight, is stressable before a resonant consonant suggests that the resonant has weight and belongs to the same syllable as schwa, since a weightless syllable is not considered for stress if another option is available. Are intervocalic resonants and obstruents parsed into syllables differently?

The issues addressed in this chapter arise out of these and other outstanding questions relating to the way stress configures in Squamish. Specifically, this chapter will deal with issues pertaining to the interactive roles of sonority and weight in the stress system and syllable structure of Squamish, and to the form and structure of syllables *per se* in the language, as well as to that of metrical feet. These questions require clarification both in retrospect, to better understand exactly why stress patterns as it does in Squamish roots, and as an antecedent to discussions arising out of the analysis of stress in polymorphemic words in Chapters 5 through 7.

In preview, the investigations pursued in this chapter show that, unlike, for instance, in Lushootseed (Urbanczyk 1996[2001]) and Cowichan (Bianco 1996), where stress is more likely to fall on vowels that are higher on the sonority scale, such as [a], than on those with lower sonority ratings, such as the high vowels, in Squamish sonority impacts on stress primarily to the extent that stress falls only on vowels (including schwa), which constitute the most sonorous class of segments universally, and that the presence of a following resonant consonant renders schwa fully as stressable as full vowels, resonants making up the most sonorous class of consonants.

In contrast, moraic weight plays a significant role in Squamish stress outcomes in that stress is attracted to syllables with weight; weight in Squamish can be inherent (in the case of full vowels) or a surface phenomenon (in coda consonants). However, there is no intersyllable competition for stress in terms of relative weight[1]: the fact that a root- (or word-) final syllable carries an additional unit of weight in the final consonant (given Hayes' 1989 Weight-by-Position Principle) does not afford it a stress advantage over a nonfinal open syllable. Thus, as shown in Chapter 3, CVCVC roots (and words) surface

[1]However, as I argue in Chapter 5, there is such a competition between morphemes designated as roots.

with stress on the leftmost syllable when it has weight (in the form of either a full vowel, as in /míx̣ał/, or a post-schwa resonant, as in /kʷə́laš/), but on the final syllable when the penult contains no weight (for instance, in /səpíq/, which has schwa followed by an obstruent). The stress difference seen in /kʷə́laš/ versus /səpíq/ supports the claim (see Chapter 3) that schwa itself is weightless, and that it is the quality of the following consonant that determines whether or not a penultimate schwa-based syllable will bear stress. The difference in moraicity between resonants and obstruents is argued in section 4.1.

In addition to differences in weight-potential, obstruents and resonants also differ in that, nonfinally, resonants are systematically parsed as codas, in contrast to obstruents, which are parsed as onsets.[2] Syllable onsets are required, however (see, for instance, section 2.2.3.3 of Chapter 2), and intervocalic resonants (for instance, in /kʷə́laš/) are therefore called on to fulfill this role as well, and they do so by means of ambisyllabicity. While positing ambisyllabicity for resonants is able to satisfy the requirement for onsets within roots (and generally within the foot),[3] it cannot do so when the resonant is situated at the edge of a foot (for instance, in CV reduplications formed on disyllabic roots, like /šə́šəwʔay/ (√šə́way) 'grow all over', and in Root=LexS combinations involving a

[2]Compare, for instance, claims that in Germanic languages an intervocalic consonant parses as coda to a preceding syllable containing a short stressed vowel (Murray and Vennemann 1983), in English an intervocalic consonant is ambisyllabic (Kahn 1980), and again in English, the glide portion of a diphthong is syllabified with the preceding syllable rather than with the following one, for instance, in [bay.ɑ.lə.ǰi] 'biology' (Clements 1990).

[3]Following Urbanczyk (1996[2001]) for Lushootseed, I argue in Chapter 5 that the root is equal to a foot.

disyllabic root, like /x̣ícimʔač/ (< √x̣ícim=ač) ‘have one’s hand itching’). Since ambisyllabicity is limited to the foot, the parsing of the resonant as a coda in this case forces glottal epenthesis in order to satisfy the requirement for an onset in the following syllable, for instance, as /(x̣ícim)(ʔač)/, /(šə́šəw)(ʔay)/; in contrast, no glottal insertion is necessary (or condoned) when the root is obstruent-final (as in /√t’ák’ʷus=áč/), as the root-final obstruent forms the onset to the suffix’s syllable. Evidence for these claims is put forward in section 4.2.

The foregoing claims lead to the inference that while obstruents are permitted as codas word-finally, nonfinal syllables consist solely of CV(R). It was argued in Chapter 2 that in surface representation roots in Squamish are predominantly CVC(VC). In contrast, in polymorphemic words it is not unusual to find strings consisting of CVCCVC, that is, with word-internal adjacent consonants (for instance, in /x̣ícq̲án/ (< √x̣ic=q-an) ‘to fell (tree); tr.’). Moreover, stress in these words may show up on both of two vowels in apparently adjacent syllables, and this in spite of observational evidence that stress clash is not permitted in the language (cf., for instance, /t’áqaʔáyus/, in which stress falls on every second syllable; and especially note that reduplicated forms like /šə́šəwʔay/ may surface with a second stress on the final syllable, but never on the intermediate one, even though that syllable is stressed in the unreduplicated form /šə́way/).[4] If, as I argue in Chapter 5, a

[4]A general constraint against stressing adjacent syllables is that stated in (i).

(i) *CLASH (based on Liberman 1975, Liberman and Prince 1977)
Adjacent syllables are not stressed.

root is equal to a foot in size (see also Urbanczyk 1996[2001]), then the best analysis for a morphologically complex CVCCVC word, virtually always a combination of a CVC root and one or more suffixes,[5] is one that consists of two feet, the first of which encloses the root, and the second, the suffix(es), thus (CVC)(CVC), and not (CVC.CVC). Postulating that CVCCVC is dipedal rather than being a single disyllabic foot recognizes that these strings are irregular (in veering from the more typical CVCVC pattern found in roots and elsewhere in the language, as well as in positing nonfinal obstruents as codas, for instance, in /(x̣íc̠.qán)/). In addition, this approach addresses the question of why stress is permitted to surface on seemingly adjacent syllables here when stress clash is not generally condoned in the language: in (CVC)(CVC) stress does not in fact surface on adjacent syllables, but in adjacent feet. The arguments for this position are continued in section 4.3.

4.1. Restrictions on segment moraicity and the relationship between weight and sonority

The way stress patterns in Squamish roots (falling, as was seen in Chapter 3, on the penultimate syllable when it contains a full vowel or a schwa–resonant sequence, as in /míx̣aɬ/, /manác’i/, and /kʷə́lаš/, but not when schwa is followed by an obstruent or a glottalized resonant, as in /səpíq/, /sməkʷəʔál/, and /həwʔít/ suggests that in Squamish full vowels and plain resonants have moraic weight while schwa, obstruents, and glottalized

[5]Squamish has a number of suffixes that consist of a single consonant, for instance, the lexical suffixes /=c/ ‘mouth’, /=č/ ‘back (anat.)’, /=q/ ‘trunk, bottom, behind’. The majority of the words in question are combinations involving a CVC root, a monoconsonantal lexical suffix, and the /-an/ transitive; /√ciq=c-ánʔ/ ‘poke s.o. in the mouth’ is a case in point.

resonants do not. This observation is stated informally here as a language-specific condition on moraicity,[6] as indicated in (1).

(1) Only full vowels and plain resonants carry weight in Squamish.

In OT, generalizations on relative segment moraicity can be captured by means of a series of micro-constraints formulated along the lines of those proposed by Prince and Smolensky (1993) for syllable peak and margin prominence, and adapted by Kenstowicz (1994a) to apply to metrical feet (see discussion in Chapter 1, section 1.4.4); the relevant constraint series are reproduced in part in (2a, b).

(2) a. Constraints on syllable sonority (Prince and Smolensky 1993)
Peak Prominence for syllables
*P/p,t,k >> ..... >> *P/i,u >> *P/e,o >> *P/a

b. Constraints on sonority for metrical feet (Kenstowicz 1994a)
Peak Prominence for metrical feet
*P/ə >> *P/i,u >> *P/e,o >> *P/a

The first of these constraints series, namely, that given in (2a), says simply that vowels are more likely than consonants to be found in syllable peaks and, furthermore, that certain vowels make better syllable peaks than certain other vowels; thus the low central vowel /a/ is ranked above mid vowels /e, o/, which in turn are ranked above high vowels /i, u/ in terms of peak candidacy. The second series, articulated in (2b), builds on this ranking, stating that when stress is metrically determined a syllable with /a/ in the nucleus position

[6]Language-specific conditions on consonant moraicity are formulated on Hayes' (1989) universal principle of Weight by Position, which states that coda consonants are moraic.

makes the best foot head, since /a/ is the most sonorous vowel, and one with schwa as nucleus, the worst.

While Prince and Smolensky's (1993) micro-constraints on syllable sonority and Kenstowicz's (1994a) adaptation for metrical feet reflect different sonority values among vowels, they do not do so among consonants (except, in the case of Prince and Smolensky, by implication, since the leftmost grouping includes only voiceless stops). It is a well-accepted fact, however, that cross-linguistically (see, for instance, Clements 1990) certain classes of consonants (especially, the resonants) in onset and coda clusters tend to be found closer to the vocalic peak of a syllable while others (obstruents in general, but especially voiceless stops) are more likely to be situated at syllable margins (and thus further away from the syllabic peak). For some languages (like Bella Coola; see Bagemihl 1991) it is postulated that resonants may themselves form syllable peaks.

Although the relative sonority of full vowels does not in general appear to affect the placement of stress in Squamish words,[7] and while it is doubtful (due to lack of independent motivation, for instance, of the type Bagemihl 1991 cites for Bella Coola; see Chapter 1, section 1.4.4, for examples and discussion) whether resonant consonants can occupy the nucleus position of a syllable in the language, the finding in Chapter 3 that in terms of stress

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[7]It has been previously mentioned, however, that although the relative sonority of full vowels has no bearing on the stress selection process itself (that is, /a/ is not a better stress-attractor than /i, u/ in Squamish), in syllables selected for stress, the high vowels /i, u/ lower to [e, o] (Kuipers 1967; see also Bar-el and Watt 1998), thus maximizing sonority in the prominent syllable. In addition, Squamish /ə/, classified as a high-mid central vowel, lowers to the mid central vowel [ʌ] under stress (Kuipers 1967:25); as the default vowel, however, schwa fluctuates widely on the surface, relying on the consonants that surround it for its feature specifications (see Chapter 2, section 2.1.2.2.1).

a schwa-based syllable is on a par with full-vowel syllables in the context of a following resonant, but not an obstruent, suggests that the summarization in (1) is on the right track. If it is, then the facts about Squamish weight and stress as they pertain to segment classes in the language suggest the dichotomy in (3), which is expressed in a manner similar to Prince and Smolensky's (1993) constraints on syllable sonority (2a) and Kenstowicz's (1994a) constraints on sonority for metrical feet (2b).

(3) Restrictions on segment moraicity for Squamish[8]
*μ/K, *μ/ə >> *μ/R, *μ/A where K = any obstruent,
R = any plain resonant
A = any full vowel

The ranked restrictions on segment moraicity in (3) suggest that it is worse to assign weight to obstruents and to schwa than it is to assign weight to resonants and to full vowels and, moreover, that within each of these two groupings there is no apparent preference for any one class of segment over any other class of segment: that is, full vowels do not make better bearers of weight than do resonant consonants, nor is schwa a better bearer of weight than are obstruents.

The claim that full vowels and resonants are more likely than obstruents to be moraic is unsurprising in that it follows for the most part from universal implications of segment

[8]Compare Morén's (2000:373) Universal Moraic Markedness Hierarchy, which states:

*MORA[plainstop] >> *MORA[vdstop] >> *MORA[plaincont] >>
*MORA[vdcont] >> *MORA[nas] >> *MORA[liq] >> *MORA[high] >>
*MORA[mid] >> *MORA[low]

Although this dissertation is predated by the Morén work, the conclusions presented here on moraic markedness and on its representation in an OT framework were arrived at independently by the author, based on her research on Squamish.

sonority (and thus from the relationship between weight and stress): vowels make the best syllable peaks, and sonorant consonants are more likely to be found around syllable peaks than are obstruents, which tend to be located closer to syllable boundaries. However, unless resonants are nuclear (and I have claimed elsewhere that they are not), it is not likely that they are on a par with full vowels in terms of weight, given that there are languages that do not permit resonants to be moraic (for instance, see Zec 1995), but no languages that do not permit full vowels to be moraic. This factor is taken into account in the revised moraicity hierarchy proposed in (4).

(4) Restrictions on segment moraicity for Squamish (revised)
*μ/K, *μ/ə >> *μ/R >> *μ/A where K = any obstruent,
R = any plain resonant, and
A = any full vowel

The revised moraicity hierarchy in (4) indicates that it is not only worse to assign weight to consonants than it is to assign weight to full vowels (since *μ/K >> *μ/A and *μ/R >> *μ/A), but it is also worse to assign weight to both obstruent consonants and to schwa than it is to assign weight to resonant consonants (*μ/K, *μ/ə >> *μ/R). Although the analysis of roots in Chapter 3 suggests that syllables containing full vowels do not hold an advantage over those containing a schwa–resonant sequence (since stress falls on a penultimate syllable with /əR/ even when there is a full vowel elsewhere in the word), resonants do not have intrinsic weight; this claim is based on observations that it is only after schwa (not after full vowels) that the presence of a resonant has any effect whatsoever on stress. If the moraicity of full vowels is intrinsic and that of resonant consonants is not, the moraicity of full vowels must be given precedence in the rankings (4) over that of resonant consonants.

In contrast to full vowels and resonants, which regularly surface with weight (although resonants are not required to do so), there is no evidence that either schwa or obstruents are ever assigned weight in Squamish, since neither is capable of attracting stress to its syllable. As for schwa, Kuipers (1967) observes that even under stress it is shorter than other vowels.

Although (4) hints at an implicational relationship between moraicity and sonority, such that weight may only be assigned to segments whose feature specifications include the feature [+sonorant], the fact that schwa, a vocoid usually identified as the least sonorous of the vowels (though without prevarication more sonorous than any consonant, including a resonant), is never assigned weight (see discussion in Chapter 3) argues against the simplistic view of a straightforward relationship between featural sonority and moraicity. Morén (1999; see also Zec 1988b, 1995) claims that such a relationship exists only for segments for which weight is nondistinctive, and not for intrinsically weighted segments. Thus, for segments with nondistinctive weight, if obstruents are moraic in a given language, then resonants, which have greater sonority than obstruents, will also be moraic in that language. In contrast, when weight is distinctive, it does not necessarily follow sonority hierarchies. For instance, Morén points out that in Hausa (Newman 1997) only resonants, and in Chechen (Nichols 1997) only obstruents have intrinsic weight.

The effect of *μ/K >> *μR is best seen in the way stress patterns in schwa-based roots because roots (and words) are consonant-final. Accordingly, the tableaux in (5-6) contain reanalyses of the roots /wə́x̣əs/ ‘frog’ and /yəqə́y/ ‘to creep’, earlier analysed in Chapter 3.

In addition to the moraicity hierarchy indicated in (4), these reanalyses are based on the assumptions put forward in this section, namely, that only full vowels have intrinsic weight, consonants have weight by position, and schwa has no weight at all. Given Weight-by-Position (WBYP), all coda consonants are potentially moraic; however, resonants are better bearers of weight than are obstruents. This observation can be captured by the constraint ranking *μ/K >> WBYP >> *μ/R (see Morén 2000). These constraints, along with ONSET, which requires every syllable to have an onset, are utilized in the following tableaux in conjunction with relevant constraints motivated in Chapter 3. Recall that according to the WSP′ prominence must be assigned to a syllable if it has weight.

(5) /wə́x̣əs/ 'frog'

	ONSET	*μ/K	WBYP	FTBIN -σ	WSP′	FTFORM= TROCHEE
a. μ (wə́.x̣əs)		*!			*	
☞ b. (wə́.x̣əs)			*			
c. μ (wə.x̣ə́s)		*!				*
d. (wə.x̣ə́s)			*			*!
e. (wə́x̣.əs)	*!		**			
f. μ μ (wə́x̣.əs)	*!	**			*	

In (5), candidates (e, f) are ruled out by ONSET; these candidates would not be selected in any case, (e) because it incurs an additional violation against WBYP, and (f) because it violates *μ/K. Candidates (a, c), which both assign a mora to the final (coda) consonant of the root, and therefore obey WBYP, are eliminated by the higher-ranking *μ/K. Of the remaining candidates, (b) wins because it adheres to FTFORM=TROCHEE, and (d) does not.

Because weight in obstruent codas is not readily condoned, the best candidate for /wə́x̣əs/ is one that contains no weight; in the absence of weight, stress surfaces by default on the penultimate syllable. In contrast, weight is condoned in a final resonant because unlike *μ/K, *μ/R is outranked by WBYP; the result is that a schwa-based root like /yəqə́y/, analysed in (6), surfaces with stress on the final syllable, which is the only syllable with weight.

(6) /yəqə́y/ 'to creep'

	ONSET	*μ/K	WBYP	*μ/R	FTBIN-σ	WSP′	FTFORM=TROCHEE
a. μ (yə́.qəy)				*		*!	
b. (yə́.qəy)			*!				
☞ c. μ (yə.qə́y)				*			*
d. (yə.qə́y)			*!				*
e. μ (yəq.ə́y)	*!		*	*			*
f. μ μ (yəq.ə́y)	*!	*		*		*	*

In (6), both candidates (e, f) violate ONSET. Candidates (b, d) fail to assign weight to the resonant in coda position, and are consequently ruled out for violations against WBYP. The best candidates, then, are (a, c), which assign a mora to the word-final resonant, and of these, (c) wins over (a) because it places stress on the only syllable with weight, thereby adhering to the WSP′, which (a) violates.

Thus, the constraint ranking *μ/K >> WBYP >> *μ/R is able to explain the different stress outcomes in roots like /wə́x̣əs/ and /yəqə́y/, which, in terms of segmental content, differ primarily in that the former has a root-final resonant, and the latter, a root-final obstruent.

4.2. The structure of syllables

As was demonstrated in Chapter 2 (section 2.2), nonfinal syllables in Squamish roots have an overwhelming tendency to adhere (at least in appearance) to the cross-linguistically favoured CV shape, in that vowels and word-internal instantiations of consonants are usually simplex. However, codas are not banned in the language, as indicated by the fact that virtually all roots (and words) are consonant-final. Although this is not entirely surprising given that variant behaviour is often found at word edges, it will be demonstrated in this section that codas are found not only word-finally but also, in the case of resonants, word-internally, since resonants tend to be identified with the syllable preceding it rather than with the one following it. This predilection for intervocalic resonants to syllabify as codas, however, interferes with a firm requirement that syllables have onsets, and Squamish resolves conflict between these factors in two distinct ways: (i) by R-ambisyllabicity within a foot (for instance, /l/ is ambisyllabic in the root /kʷə́laš/, which constitutes a foot), and

(ii) by R-glottalization at a foot boundary (for instance, /m/ undergoes glottalization in the polymorphemic /x̣ícimʔač/ (< x̣icim=ač) 'have one's hand itching'). In the first instance, ambisyllabicity permits the intervocalic resonant /l/ to serve as both coda to the preceding syllable and onset to the following syllable; in the second instance, the derived glottalized resonant /mʔ/ (which, as a surface phenomenon, is assumed to comprise two segments: a plain resonant /m/ and an epenthetic /ʔ/) divides itself between coda and onset, with the resonant portion serving as coda to the final syllable of the root's foot, and the glottal portion, as onset to the suffix's syllable. The evidence for simple CV syllables in Squamish is here reviewed in section 4.2.1, while the (conflicting) evidence for resonant codas is presented and discussed in section 4.2.2.

4.2.1. Evidence for CV

4.2.1.1. Simple nuclei

Nuclei are vocalic and simple. The investigation of phonotactic constraints on syllable structure in Chapter 2 (section 2.2) indicated that the vast majority (96%) of vowel instantiations in roots were simplex. An examination of vocalic nuclei contained in affixes (listed in Appendix B) shows further that, in contrast to roots, which occasionally surface with complex nuclei, vowels in affixes are always simplex. The simple nucleus hypothesis is strengthened by the observation that vowels are usually short (in fact, even under stress they are only half-long).

Importantly, although the syllabicity of resonants following another (tautomorphemic) consonant (for instance, /k^{w}laš/ → [k^{w}l̩aš]) suggests that, in addition to vowels, resonants may also be able to occupy nuclei, the fact that schwa-epenthesis in the resulting syllables is obligatory under stress (for instance, in [k^wə́laš]) points to a conclusion that the resonant is in the coda of the syllable, and not in the nucleus. Evidence from syllabification across morpheme boundaries, presented later in this section, will uphold this analysis of syllabic resonants.

4.2.1.2. The requirement for onsets

Proof that onsets are required and that they are simple comes from both roots and morphologically complex words. The evidence from roots in Chapter 2 showed that all roots have a consonant at the left edge, and that this consonant is simple in more than 97 percent of cases; in addition, approximately 83 percent of root-internal consonant instantiations consist of a single consonant. Given the cross-linguistic tendency of languages to maximize onsets and minimize codas, this is a clear indication that Squamish prefers simple onsets.

The conclusion that onsets are required is supported by evidence from glottal insertion at the junctures between roots and vowel-initial lexical suffixes.[9] The data listed in (7) indicate three different ways in which syllabification takes place across the root–suffix morpheme boundary. The pattern seen in (7a) is representative of concatenations that result in the juxtaposition of two vowels at the morpheme juncture (as a consequence of

[9]Unlike grammatical suffixes, which are predominantly consonant-initial, the majority of lexical suffixes, which are usually affixed directly to a root, are vowel-initial: 65% of all lexical suffixes (75% if only lexical suffixes with vocalic content are considered) have a vowel at their left edges; see discussion in Chapter 6, section 6.1.1.

combining a vowel-initial suffix with a root-final vowel[10]), and always result in glottal-epenthesis between the conjoined vowels. As well, glottal epenthesis is frequently (but not always) observed before a vowel-initial suffix when the root with which it is combined is consonant-final and this consonant is a resonant, as in (7b). In contrast, glottal epenthesis never occurs at the morpheme juncture between a vowel-initial suffix and an obstruent-final root.[11]

(7) Glottal insertion at Root=LexS boundary

a. V=V → VʔV

t-x̣i+x̣ta=ʔáwanəx^{w}	‘the year before last; last year’ (√x̣ə́ta ‘far’, =awanəx^{w} ‘year’)
q^{w}ú=ʔus	‘tears’ (√q^{w}u ‘water’, =us ‘face’)
s-wiʔqa=ʔúlɬ	‘boy’ (s-wíʔqa ‘man’)

b. i. R=V → RʔV

čə́m=ʔus	‘meet, come together (face to face)’
nəx^{w}-ʔí-√ʔx^{w}n=ʔus	‘sad-looking’
n-c’q^{w}úl=ʔač	‘glove’ (=ač ‘hand, arm’)
x̣ícim=ʔač	‘have one’s hand itching’
miíw=ʔax̣an	‘side, edge’ (=ax̣an ‘side’)
šuk’^{w}um=ʔáwʔtx^{w}	‘bathhouse’ (=awʔtx^{w} ‘house’)

[10]Root-final vowels are admittedly rare.

[11]Kuipers’ (1967:73) mentions an exceptional case where a glottal stop surfaces at this juncture. The word in question is /nx̣ətx̣ítʔayus/ ‘far-sighted’ (cf. /√x̣ə́ta/ ‘far’; /=ay(ʔ)us/ ‘eye’), and Kuipers suggests the possibility that the root has an underlying final glottal stop (thus, /x̣ə́taʔ/). However, the underlying form of the concatenation /n-x̣əta=ayus/ suggests that the glottal is there to separate the root-final and suffix-initial vowels (underlined), as in the examples listed in (7a); the surface form, /nx̣ətx̣ítʔayus/, has dropped the root-final vowel /a/ and kept the epenthetic glottal stop, making it look like a case of glottal insertion after an obstruent (cf. /t-x̣i+x̣ta=ʔáwanəx^{w}/ ‘the year before last; last year’, which is based on the same root).

ii. R=V → RV

n-q’íl=us-m	‘clever’
x̣^{w}áy=ač	‘have a paralysed arm’
q^{w}ín=ač	‘hair on hands’
k’^{w}in=áɬ	‘how often?’ (=aɬ ‘times, instances’)
s-tam=áwʔtx^{w}	‘what kind of house?’

c. K=V → KV

qx=ús	‘be assembled’
s-číɬ=us	‘hill’ (√čiɬ ‘top’)
k’^{w}ás=ač	‘burn one’s hand’
k’^{w}q=áč	‘have a branch hanging off (tree)’
t’ák’^{w}us=áč	‘seven’
x̣-č’ít=ax̣an	‘the near side’

The examples listed in (7) contain several important clues about syllabification in Squamish and about the structure of Squamish syllables. First, the observation that glottal insertion is necessary in order to separate two edge-based vowels in juxtaposition (7a) not only indicates that the vowels must be parsed into different syllables, but also reaffirms that syllables are required to have onsets. Second, the contrast between surface manifestations of V=V juxtapositions, which require glottal epenthesis (7a), and those of K=V sequences, which do not (7c), is proof that syllabification takes place across the Root=LexS morpheme boundary; if it did not, we would expect the glottal to surface regardless of the designation of the root-final segment (that is, following a root-final obstruent as well as after a root-final vowel, given that onsets are required in the language). In contrast to underlying V=V, where glottal insertion is necessary to meet the requirement for an onset in the first syllable of the suffix, in K=V this onset requirement is fulfilled by parsing the root-final obstruent into the suffix. Third, the observation that glottal epenthesis frequently occurs following a root-final resonant (7b.i) suggests that without the glottal, the suffix’s syllable is considered onsetless, and thus that a root-final resonant sides with the final syllable of the root, unlike an obstruent in the same position, which does not. However, the conflicting data in (7b.ii), which do not exhibit glottal insertion, argue against such a straightforward solution to the problem. The next section goes into the matter in greater depth, showing that the different surface manifestations exhibited by the data in (7b.i), which have undergone resonant glottalization, and (7b.ii), which have not, follow a generally predictable pattern.

4.2.2. Resonant as coda

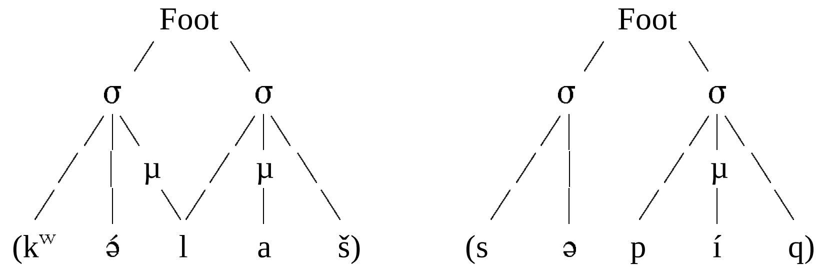
As suggested in the previous section, the observation that, unlike in the case of obstruent-final roots (7c), glottal epenthesis frequently take place when the root ends in a resonant (7b.i) implies that without glottal insertion the vowel-initial suffix is onsetless. The fact that the glottal typically shows up at a junctural boundary following a resonant suggests that the resonant (unlike an obstruent in the same position) is seen as belonging to the final syllable of the root rather than to the initial syllable of the suffix. To the extent that this is true, it has significant undertones for the way resonants and obstruents are parsed into syllables, implying that unlike obstruents, which are parsed as onsets, resonants are parsed as codas. In spite of universal tendencies to maximize onsets and minimize codas, it has been claimed by a number of researchers that in particular languages and under particular circumstances, intervocalic consonants may be parsed as codas rather than as onsets. For instance, Murray and Vennemann (1983) suggest that in Germanic languages an intervocalic consonant tends to be parsed as coda to a preceding syllable containing a short stressed vowel, and Clements (1990) claims that in English the glide portion of a diphthong is syllabified with the preceding syllable rather than with the following one, for instance, in [bay.ɑ.lə.ǰi] 'biology'. In other work, Wiebe and Derwing (1992, 1994) and Wiebe (1998) used segment count and deletion tasks (in the first instance) and sound similarity judgement tasks (in the second instance) to show that speakers of an unwritten Low German dialect consider post-vocalic resonants to be part of a complex nucleus, reserving the coda position for post-vocalic obstruents.

The supposition that word-internal resonants and obstruents are parsed into syllables in different ways sheds some light on a problem first encountered in Chapter 3, where it was observed that stress configured differently in disyllabic roots with schwa in the initial syllable and a full vowel in the final, depending on the quality of the post-schwa consonant; that is, stress fell on schwa in the initial syllable when it was immediately followed by a resonant, as in /k^{w}ə́laš/, but not when the consonant following schwa was an obstruent, as in /səpíq/. While disyllabic bare roots like /k^{w}ə́laš/ do not surface with a glottal between the resonant and the following vowel (unlike in the morpheme concatenations seen in (7b.i), for instance, /čə́m=ʔus/), the fact that the presence of a resonant lends weight to a preceding schwa-based syllable suggests that the resonant is nevertheless (initially) parsed as a coda and not as an onset; in contrast, a post-schwa obstruent, which does not lend weight to the preceding syllable, is straightforwardly parsed as an onset. Although the word-internal resonant is parsed as a coda first, the onset requirement forces it to double as onset to the following syllable as well.

The differential parsings of intervocalic resonants and obstruents are illustrated in (8a, b), which use the roots /k^{w}ə́laš/ and /səpíq/ as examples.

(8) Syllable structure of /k^{w}ə́laš/ vs. /səpíq/

a. /k^{w}ə́laš/ ‘to shoot’ b. /səpíq/ ‘yellow salmonberry’



The depiction in (8a) shows that parsing the post-schwa resonant into a coda provides the schwa-based syllable with weight, while the more usual parsing of the post-schwa obstruent (8b) does not. These depictions show also why roots like /k^{w}ə́laš/ surface with stress on the penultimate syllable, while roots like /səpíq/ stress the final syllable, since the former, but not the latter, have weight in the penult, the preferred syllable for stress.

The parsing of /k^{w}ə́laš/ in (8a) represents the intervocalic resonant as ambisyllabic, thus serving as onset to the second syllable as well as coda to the first. This is the obvious conclusion to be drawn, given that syllables must have onsets and that no glottal is provided to fill the role of onset to the second syllable of the foot.

The putative ambisyllabicity of resonants in Squamish can be compared to claims by, for instance, by Kahn (1976[1980]), who contends that in American English, intervocalic alveolar stops (which surface as taps) are ambisyllabic when a stressed open syllable is followed by an unstressed syllable (for instance, in [sɪ́ɾi] ‘city’ and [hɪ́ɾɪŋ] ‘heating’) and, further, that ambisyllabicity also occurs when a vowel-initial word follows a consonant-final one (for instance, in [lɛɾæn] ‘let Ann’). As a result of consonant-sharing, the initial syllable in 'city' gets a coda, and the final syllable (word) in 'let Ann' gets an onset. Gussenhoven (1986) subsequently used ambisyllabicity to account for the behaviour of intervocalic consonants in a number of other cases in both American and British English. follows a similar track for British English. For instance, the vowels [ɛ, ɔ, æ] tend to occur only in stressed, closed syllables; in a word like [ʔǽli] 'alley', therefore, the intervocalic /l/ must be shared between the two syllables in order to satisfy both the requirement that syllables with stressed /æ/ be closed and the requirement that syllables have onsets. Similar claims for ambisyllabicity in a number of other languages are put forward in, for instance, Vennemann (1982), Borowsky, Itô, and Mester (1984), and van der Hulst (1985).

Although Kuipers (1967) does not indicate that resonants (or any consonants) are ambisyllabic in Squamish, and even though gemination is not common in the language,[12] the investigation in this section suggests that intervocalic resonants are typically shared between the syllables that precede and follow them, and that they are parsed initially as codas.

The absence of resonant glottalization in the forms listed in (7b.ii) indicates that ambisyllabicity of an intervocalic resonant is the rule not only in disyllabic roots, but in any case where the resonant is situated between the two syllables of a foot. For convenience, the data in (7b.ii) are repeated here in (9). The parentheses in the rightmost column indicate the main foot configuration for each listed form.

[12]Borowsky et al (1984) contend that there is in essence no distinction between ambisyllabic (short) and geminate (long) consonants, both of which are shared by neighbouring syllables; individual languages exhibiting this type of phenomenon will tend to have one or the other, but not both.

(9) R=V → RV

n-q’íl=us	‘clever’	n-(q’ílus)[13]
x̣^{w}áy=ač	‘have a paralysed arm’	(x̣^{w}áyač)
q^{w}ín=ač	‘hair on hands’	(q^{w}ínač)
k’^{w}in=áɬ	‘how often?’	(k’^{w}ináɬ)

Clearly, there is a distinct stress advantage to parsing the word-internal resonant in words like /k^{w}ə́laš/ as a coda, since it lends weight to the penultimate syllable, which is preferred for stress. While it is true that there is no stress advantage to parsing an intervocalic resonant as coda in words involving only full vowels (for instance, in /míx̣aɬ/), the observation that junctural R-glottalization takes place in polymorphemic combinations like /x̣ícim=ʔač/ (7b.i) suggests that resonants in Squamish are parsed into codas as a matter of course (and not just when an underlying CR sequence is encountered).

Corroboration for this position is found in CV- reduplicative data involving CVRVC roots or stems. The data in (10a), which compare surface forms of CV- reduplicative forms of roots/stems with an intervocalic resonant (which appear with their glosses in the two leftmost columns) with those of their unreduplicated counterparts (listed in the column on the right), illustrate that plain intervocalic resonants in the root (for instance, in /šə́way/) are glottalized in the corresponding CV- reduplications (for instance, in /šə́šəwʔay/). In contrast, CV- reduplications of roots/stems with intervocalic obstruents, listed in (10b), are unchanged in this respect.

[13]Non-reduplicative prefixes are not footed; see Chapter 5.

(10) Resonant glottalization in CV- reduplicated stems

CV- reduplicated stem		Root/Stem for reduplication
a. Root/Stem with intervocalic resonant		
ʔí+ʔimʔaš	‘be walking around’	ʔímaš
hí+hilʔit	‘roll; tr.’	híl-it
s-ɬá-ɬənʔayʔ	‘female’	s-ɬánayʔ
šə́+šəwʔay	‘be growing’	šə́way
p’á+p’ayʔaq-n	‘cure; tr.’	p’áyaq-n
čə+čəwʔát=ayʔ	‘help each other’	č’áw-at
b. Root/Stem with intervocalic obstruent		
ƛ’í+ƛ’ix̣ʷay	‘brook trout’	
c’ú+c’uɬum	‘be cold’	
s-hú+hupit	‘rabbit’	
p’á+p’aqʷiɬ	‘play with toy canoe’	

The exemplary data in (10a) show that when a CVRVC root or stem is reduplicated, the resonant in the root is glottalized (leftmost column); in contrast, there is no surface glottalization of the resonant in the stem for reduplication (rightmost column), nor does glottal epenthesis occur when the intervocalic consonant in the root/stem is an obstruent (10b). The pre-reduplicative forms are generally disyllabic and make wellformed binary feet. In contrast, the reduplicated stems on the left contain at least three syllables, and the fact that stress tends to be on the reduplicant indicates that a left foot bracket must be aligned with the left edge of the reduplicant.[14] Stress in the root/stem portion of these words is reconfigured as a result; this is shown by /čəčəwʔátayʔ/ (< √čáw-at), where stress falls on the second syllable of the stem (/-at/) and not on the first, as it does in the bare stem.[15]

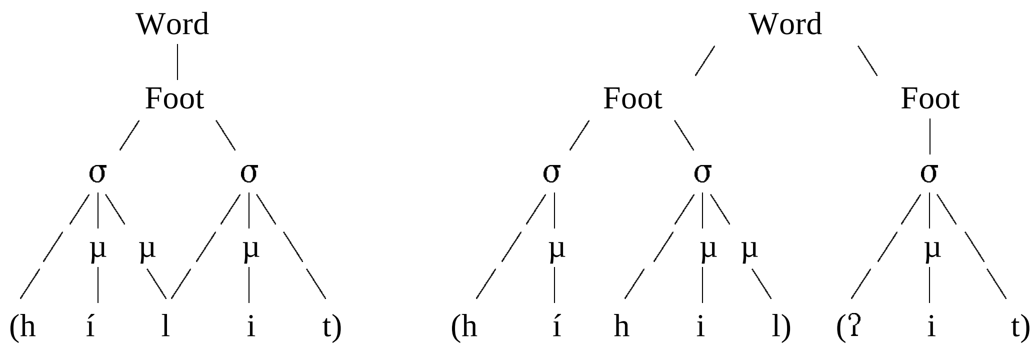
[14]For a full analysis of stress in CV- reduplicated stems, see Chapter 5, section 5.3.2.

[15]Although stress does not actually fall on the reduplicant in this case, it is obvious that stress is configured from the left edge, since stress shift takes place in the stem.

Thus disyllabic feet are formed at the left edges of polysyllabic words resulting from CV-reduplication, and the occurrence of resonant glottalization coincides with the edge of that foot. This is illustrated in (11).

(11) Foot/Syllable structure of /híhilʔit/ vs. /hílit/ 'roll; tr.'

a. /hílit/ b. /híhilʔit/



The glottalization of the resonant in these forms thus occurs when the resonant finds itself at the edge of a foot. In this way, the resonant can be syllabified as coda to the final syllable of the leftmost foot (which splits the root in two), while still providing the syllable following it with an onset. The fact that intervocalic resonants are usually not glottalized in bare roots (such as /k^{w}ə́laš/ 'to shoot') and in disyllabic suffixed forms (for instance, in /hil-it/ 'roll; tr.') indicates that resonants can function as both coda to a preceding syllable and onset to a following one when both syllables are contained within the same foot; however, when the two syllables are situated in different feet, as is the case in the CV-reduplicated stems in (9a), the resonant must be glottalized in order to fulfill both mandates, since ambisyllabicity is not possible across foot boundaries.

In summary, an intervocalic resonant faces conflicting demands, namely, that it serve as coda to a preceding syllable and that it serve as onset to a following syllable. Within a foot it can satisfy both demands with impunity. However, at a foot edge it must find a different means of satisfying the following syllable’s onset requirement, and it does so by surface glottalization. This shows that the demands placed on the resonant by the preceding syllable (R as coda) take precedence over those of the following syllable (onset requirement).

The parsing of resonants as codas is covered by the new constraint in (12).

(12) CODA-R
Word-internal resonants are parsed as codas.

That some such constraint is operative in Squamish is suggested by the evidence, presented in this and the preceding section, that glottal epenthesis frequently occurs between a root-final resonant and a vowel-initial lexical suffix (for instance, in /x̣ícimʔač/ ‘have one’s hand itching’, < /√x̣ícim=ač/; see 7b.i), and consistently occurs following a resonant contained within a disyllabic root/stem when it is CV- reduplicated (as in /sɬáɬənʔayʔ/ ‘female’, < s-√ɬánayʔ; see 10a), whereas it never occurs in these environments when the corresponding root-final or -medial consonant is an obstruent (comparative examples from (7c) and (10b) are /√t’ák’^{w}us=áč/ ‘seven’ and /s-hú+√hupit/ ‘rabbit’). The significance of the presence or absence of a surface glottal stop in these contexts is that the intervocalic obstruent automatically fulfills the onset requirement of the following syllable, but the intervocalic resonant does not necessarily do so, and the indication is that the latter is parsed as a coda.

Furthermore, given the compelling evidence (see Chapter 3, as well as earlier sections of this chapter) that in Squamish schwa is weightless, but resonants are moraic, parsing a post-schwa resonant as a coda results in many syllables having weight that would otherwise be weightless, and at the same time accounts for the ability of these syllables to bear stress (as, for instance, in /kʷə́laš/ 'to shoot'; cf. /səpíq/).

In addition, there is some cross-linguistic justification for positing a constraint such as CODA-R in that a number of scholars (for instance, see Clements 1990) have observed that (in Germanic languages at least) resonants make better codas than onsets do, in contrast to obstruents, which make better onsets than codas do.

CODA-R dominates both ONSET (which states that syllables must have onsets) and NOCODA (which bans codas in syllables). This is illustrated in the following tableaux. Note that the ambisyllabicity of a segment is indicated here and in subsequent tableaux by the absence of a syllable break, as in (13e); at the same time the ambisyllabic segment is set off from its nearest neighbours by means of a space.

(13) /kʷə́laš/ 'shoot'

μ √kʷlaš	CODA-R	ONSET	NO CODA	FTBIN-σ	WSP′	FTFORM= TROCHEE
a. μ (kʷláš)	*!		*	*		*
b. μ (kʷə.láš)	*!		*			*
c. μ μ (kʷə́l.aš)		*!	**		*	
☞ d. μ μ (kʷə́ l aš)			**		*	
e. μ μ (kʷə l áš)			**		*	*!

In (13), candidates (a, b) are not considered because they parse the intervocalic resonant as an onset rather than as a coda. Candidate (c), which does parse /l/ as a coda, fails to provide an onset to the second syllable, and is therefore also eliminated. Of the candidates that pass both CODA-R and ONSET by positing the intervocalic resonant as ambisyllabic, the trochee in (d) wins over the iamb in (e).

In contrast, when the intervocalic consonant is an obstruent, as in /səpíq/, analysed in (14), a form that posits the obstruent as ambisyllabic, such as that in (14b), is ruled out because it incurs a double violation to NOCODA.

(14) /səpíq/ 'yellow salmonberry'

μ √spiq	CODA-R	ONSET	NOCODA	FTBIN-σ	WSP′	FTFORM=TROCHEE
a. μ (spíq)			*	*!		*
☞ b. μ (sə.píq)			*			*
c. μ (sə́.piq)			*		*!	
d. μ μ (sə́p.iq)		*!	**		*	
e. μ μ (sə p íq)			**!			*

In (14), candidate (d) is eliminated by ONSET, (e) is ruled out by NOCODA, and (a) by FTBIN-σ. Of candidates (b, c), which differ only in stress orientation, the former wins because, although it features an iambic foot rather than the preferred trochee, it places stress on the only syllable with weight, thereby obeying the WSP′.

A comparison of the analyses in (13-14) shows that singling out candidates featuring an intervocalic resonant as coda (13d, e) and ruling out candidates featuring an intervocalic obstruent as coda (14d, e) can be achieved by the constraint ranking CODA-R >> ONSET >>

NOCODA. The evidence presented earlier in this section (especially that pertaining to R-glottalization) makes it clear that resonants are to be considered codas, unlike obstruents, which are onsets (when nonfinal). However, not only are resonants more likely than obstruents to be found in codas, but they are also better bearers of weight than are obstruents; recall that in section 4.1 it was argued that *μ/K >> WBYP >> *μ/R. Thus, although the analyses in (13-14) give the correct stress outcomes for /k^{w}ə́laš/ and /səpíq/, they do not tell the whole story. The tableau in (15) looks at a sub-selection of the candidates in (14) in these terms. (CODA-R is omitted, as the word contains no resonants.)

(15) /səpíq/ 'yellow salmonberry'

μ √spiq	ONSET	NO CODA	*μ/K	WBYP	WSP′	FTFORM= TROCHEE
a. μμ (sə.píq)		*	*!			*
☞ b. μ (sə.píq)		*		*		*
c. μ (sə́.piq)		*		*	*!	
d. μ μ (sə́p.iq)	*!	**	*		*	

In (15), candidate (d) is eliminated because it parses the intervocalic obstruent as coda instead of onset and consequently incurs a violation against ONSET. Candidate (a) is ruled out for violating *μ/K: a weightless coda obstruent is preferred to one with weight. Again, the winning candidate (c), which corresponds to (14b), is selected on the basis of the WSP′.

In contrast, when the intervocalic consonant is a resonant (as in /k^{w}ə́laš/), there is no interference from *μ/R because this constraint is relatively low-ranked; see (16).

(16) /k^{w}ə́laš/ ‘shoot’

μ √k^{w}laš	CODA-R	ONSET	NO CODA	*μ/K	WBYP	*μ/R	WSP′	FTFORM= TROCHEE
a. μ (k^{w}ə.láš)	*!		*		*			*
b. μ μ (k^{w}ə́l.aš)		*!	**		*	*	*	
☞ c. μ μ (k^{w}ə́ l aš)			**		*	*	*	
d. μ μμ (k^{w}ə́ l aš)			**	*!		*	*	
e. μ μ (k^{w}ə l áš)			**		*	*	*	*!

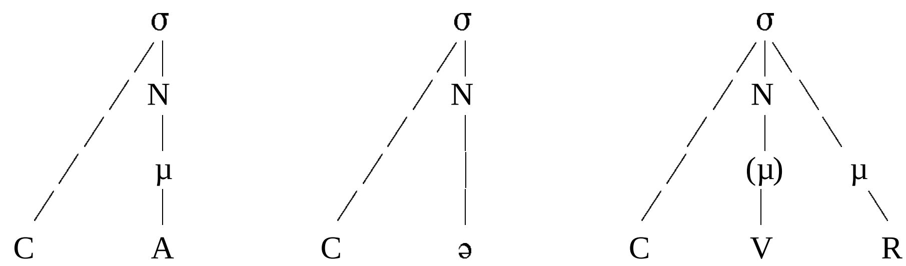
In (16), candidate (a) is ruled out by CODA-R, (b) by ONSET. Candidate (d), which links a mora to the root-final obstruent coda, is eliminated by *μ/K, and the trochaic form posited by candidate (c) wins over the iamb in (e).

4.2.3. Syllable types in Squamish

The evidence in the foregoing subsections argues for the following syllable types for Squamish. Although Squamish has a canonical CV syllable, the evidence presented in the preceding section, which shows that resonants are typically parsed as codas, argues for the inclusion of CVR as a viable syllable type. The syllable types in (17) are therefore posited.

(17) Nonfinal syllable types in Squamish[16]

a. CA syllables b. Cə syllables c. CVR syllables



The syllable types depicted in (17) reflect the observation that in nonfinal position Squamish syllables are either open (17a, b) or closed by a resonant (17c). In terms of weight, open syllables are of two types, namely CA (17a), which contains one unit of weight in the full vowel, and Cə (17b), which contains no weight. Closed syllables (17c) also differ with regard to syllable weight in that CAR syllables potentially contain two units of weight, in the full vowel and in the resonant, while CəR contains a single mora in the resonant; this difference is indicated in (17c) by means of parentheses surrounding the mora associated with the vowel.

4.3. The structure of feet

It was mentioned earlier in this chapter that although moraic weight plays a significant role in Squamish stress in that stress is attracted to syllables with weight, relative weight is a deciding factor between syllables only when one syllable contains weight and the other does

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[16]Because intervocalic obstruents are parsed as onsets rather than as codas, nonfinal CVK syllables, which are not included here, are relatively uncommon, tending to be found mainly in polymorphemic concatenations consisting of a CVC root, a monoconsonantal lexical suffix, and the *-an* transitive (see fn. 5). The configuration of these constructions is discussed in section 4.3.

not. Thus, the fact that a root- (or word-) final syllable is capable of carrying an additional unit of weight in the final consonant (given Weight-by-Position) does not afford it a stress advantage over a nonfinal open syllable. Indeed, as Davis (1984a) observes, the final (heavy) syllable of a disyllabic word tends to get the stress only when the initial syllable is also heavy, not, as one would expect (given cross-linguistic tendencies favouring heavy syllables for stress), when the initial syllable is light.[17] Given that CVCCVC words tend to be polymorphemic, usually consisting of a monosyllabic CVC root and one or two suffixes (for instance, /√CVC=C-VC/ in /√x̣íc=q-án/), I argue that seemingly "bizarre" (in Davis' terms) stress behaviours like this are entirely predictable in light of the claim made here that CVC is a foot and not simply a syllable.[18] If CVC is just a syllable within a larger foot, then the observation that stress can surface twice in a CVCCVC (CVC.CVC) string (for instance, in /x̣ícqán/ 'to fell (a tree)' is decidedly odd, given a general ban against stressing adjacent syllables. However, if CVC is a foot, this behaviour is completely fathomable, as there is no ban against stressing vowels in adjacent feet[19]; in fact, such behaviour would be

[17]Davis claims that stress targets the first (leftmost) syllable if it is light (CV); otherwise, stress falls on the second (heavy) syllable. Thus, a /CV.CVC/ form will surface with penultimate stress, while a /CVC.CVC/ will have final stress. (It should be noted that final stress is consistent only in cases where the root's vowel is schwa.)

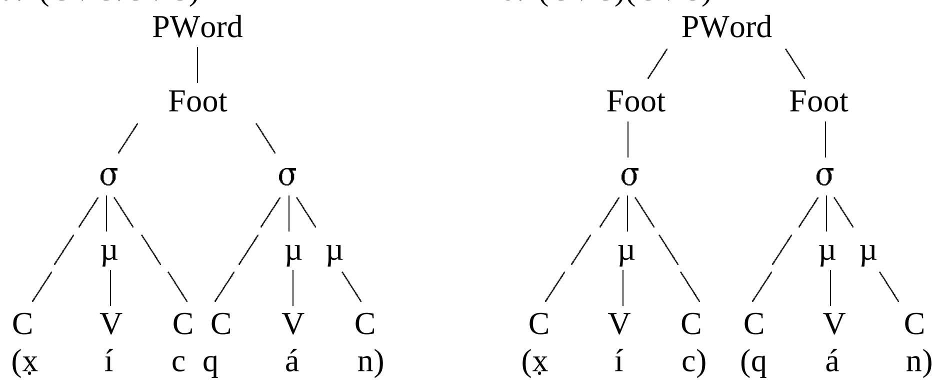
[18]Observations of similar stress patterns in neighbouring Lillooet have led researchers to conclude for that language that the intervocalic consonant cluster counts as a syllable in the computation of alternating stress patterns (Roberts 1993; see also Roberts and Shaw 1994; Shaw 1996b).

[19]I argue in Chapter 6 that the ban against stress clash is a prosodic stem level phenomenon; adjacent syllable stress is in fact condoned in certain types of concatenations, for instance, in Root=LexS dual-stem compounds like /s√taqìw=úlɬ/ 'colt' ($[_{PS}$(staqìw)$]_{PS}$ $[_{PS}$(úlɬ)$]_{PS}$; see also Watt 2001). The two prosodic stems are footed separately, with the result that the adjacent stressed syllables are situated in different feet. In a similar vein, I provide evidence in Chapter 7 that the *-an* transitive suffix resides outside the prosodic stem (for instance,

expected, given the alternating stress pattern seen elsewhere in the language (for instance, in /(t’áqa)(ʔáyus)/ ‘have a black eye’, where stress falls on alternating open syllables which are situated in different feet).

The structural difference between the two analyses is illustrated in (18), using /x̣ícqán/ ‘to fell (a tree); tr.’ as an example.

(18) Monopedal vs. dipedal analysis of CVCCVC string
a. (CVC.CVC) b. (CVC)(CVC)



The structure in (18a) illustrates in part that, given *μ/K >> WBYP >> *μ/R, a CVCCVC string analysed as a disyllabic foot (CVC.CVC) will typically contain between two and four moras, depending on whether the two codas consist of obstruent or resonant consonants; the string in (18a) has a mora count of three, and thus comprises a superheavy foot. If, as I claim in Chapter 5, a root is a foot, the paucity of trisyllabic roots in Squamish suggests that feet should be maximally binary at the syllabic level, and given that even disyllabic roots (and especially disyllabic roots containing more than two moras) have a

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in [$_{PP}$[$_{PS}$x̣ícq]$_{PS}$-an]$_{PP}$); this being the case, apparent stress clash is not a problem for /x̣ícqán/, since only one of the two stresses is contained within the prosodic stem.

relatively low frequency count, it seems that this maximal binarity applies at the moraic level as well.

In contrast, when the same CVCCVC string is analysed as dipedal (18b), that is, as (CVC)(CVC), each foot contains at most two moras. While the foot posited by (18a) is technically admissible, being binary under syllabic analysis, it is irregular for Squamish, where obstruent-closed syllables are predominantly word-final. The unsatisfactoriness of the analysis in (18a) is underscored by its failure to avoid adjacent-syllable stress clash. Furthermore, there is no stress advantage to having a heavy penultimate syllable, as the penultimate syllable is favoured for stress whenever it contains weight.

While a polymorphemic CVCCVC string favours a dipedal analysis, the best analysis for a CVCVC string is one that posits the string as a single disyllabic foot (that is, CVCVC is not equivalent to a CV syllable plus a CVC foot). This was established in Chapter 3, where it was demonstrated that CVCVC roots constitute fully parsed binary syllabic trochees, and will be corroborated by the examination of stress in polymorphemic data in Chapters 5 through 7.

The claims that CV is a syllable and CVC is a foot have far-reaching consequences for the analysis of Squamish stress in morphologically complex words in the following chapters. For instance, the distinction proves essential in accounting for the different ways in which stress surfaces in CV- and CVC- reduplicated stems (Chapter 5); and, as already mentioned, the definition of CVC as a foot permits a satisfactory explanation for what has all the appearances of stress clash in transitive forms like /x̣ícqán/ (Chapter 7).

4.4. The parsing of underlying glottalized resonants

In Chapter 3 (see, for instance, section 3.1.1.2), it was observed that the stressability of schwa in Squamish is context-driven; specifically, it was found that whereas stress surfaces on a schwa in the penultimate syllable when the following segment is a plain resonant (as, for instance, in /kʷə́laš/), it fails to do so when the following segment is either an obstruent or an underlyingly glottalized resonant (as, for instance, in /səpíq/ and /həwʔít/). While the different stress results seen when schwa precedes a plain resonant and when it precedes an obstruent can be viewed in terms of sonority differences between the two main consonant classes, those depending on whether a following resonant is plain or glottalized are not as straightforwardly explained. In this section I return to a discussion of the relationship between schwa-stressability and the presence of post-schwa glottalized resonants, showing that the reason schwa is unstressable in this context is due to glottal restructuring, which rearranges an underlying glottalized resonant, /Rʔ/, on the surface as [ʔR][20]: because the glottal stop in Squamish is grouped with the class of obstruents, rather than with that of resonants (see discussion in Chapter 2, section 2.1.1), the preceding schwa finds itself in the environment of a following obstruent, and not a resonant, and is therefore not considered for stress. It is important to note that the discussion in this section pertains specifically to underlying glottalized resonants, and not to the surface glottalization analysed in the preceding section.

[20]This is in contrast to the surface glottalization of underlying plain resonants that permits a foot-final resonant to be parsed as a coda while still satisfying the requirement for an onset in the syllable to its right; see data and discussion in section 4.2.2.

As in a number of other Salishan languages (see, for instance, Blake 1992, 2000b on Sliammon; Montler 1986 and Caldecott 1999 on Saanich; van Eijk 1985 and Caldecott 1999 on Lillooet), glottalized resonants in Squamish are subject to glottal restructuring, especially intervocalically. For instance, Montler (1986) noticed that in the Coast Salishan language of Saanich the glottalization associated with the resonant in words featuring word-internal glottalized resonants tended to be attracted to a syllable with stress; thus the glottalized resonant surfaced as [ʔR] when following a stressed vowel but as [Rʔ] when preceding a stressed vowel. Following this thread, Caldecott (1999) compared the phonetic locus of glottalization in the glottalized resonants of Saanich with those of the Interior Salishan language of Lillooet and found an opposite trend in Lillooet, where glottalization is apparently repelled by the stressed syllable. Partial results of Caldecott's comparative study are given in the table in (13).

(13) Comparison of locus of glottalization in intervocalic glottalized resonants

	Environment	Saanich	Lillooet
pre-stress	V__V́	Rʔ	ʔR
post-stress	V́__V	ʔR	Rʔ

While the locus of glottalization in the intervocalic glottalized resonants of Saanich and Lillooet is clearly governed by the site of stress in the words of those languages, with glottalization being attracted to stressed syllables in Saanich and repelled by stressed syllables in Lillooet, that in Sliammon (a Mainland dialect of the Coast Salishan language of Comox, and the focus of much research by Blake; see, for instance, Blake 1992, 1999, 2000b, 2001) is apparently not affected by stress at all, as (at least intervocalically) glottal restructuring tends to result in pre-glottalization (ʔR) regardless.[21] [22]

In Squamish, too, the locus of glottalization appears not to be connected to the site of word stress, and intervocalic glottalized resonants tend to surface as the pre-glottalized sequence [ʔR] (or some variation thereof, like [ʔ^{R}, ^{R}ʔ^{R}, ʔ^{V}, ^{R}ʔ^{V}]; see examples below). Kuipers (1967:32-33) notes that while the glottal closure tends to occur near the beginning of the articulation of the resonant even word-finally and before a consonant (but with considerable variation both between speakers and in an individual's speech), it is especially likely to occur at the beginning of the resonant when the glottalized resonant falls before a vowel[23] or a syllabic resonant (for example, as in /námʔn/ → [ná·^{m}ʔmn̩, ná·^{m}ʔm̩n̩] 'go and get someone; tr.'). To a lesser extent (and with considerably more variation) this effect may also obtain word-finally or before an obstruent (for instance, in /ʔálʔs/ → [ʔá·lʔs] 'to pity' also has the less frequent variant [ʔá·ʔl̩s]; but compare also /x̣^{w}ílʔt/ → [x̣^{w}έʔεlt] 'take out, take off'; /x̣^{w}ílʔm/ → [x̣^{w}έʔεlm̩] 'rope'). For glides, it is common to get a vocalized variant

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[21] In terms of stress, Sliammon has trochaic feet, with primary stress occurring at the left edge of the morphological stem (Blake 2001). It is possible, then, that the locus of the glottalization intervocalically is stress-related; however, Blake does not specify this and it is not immediately clear from the examples given.

[22] In fact, Blake (2001) uses this as a major part of her analysis of stressed schwa, arguing that while open schwa-based syllables cannot usually be stressed in Sliammon, the restructuring of segmental Rʔ to sequential ʔR gives moraic weight to a preceding schwa-based syllable, thus making it stressable. Note that all consonants in coda position are posited as moraic for Sliammon.

[23] In Squamish, glottalized resonants do not occur word-initially or following a consonant (Kuipers 1967).

of the resonant appearing after the glottal stop as a reflex (examples are /ʔáyʔx̣/ → [ʔá·ʔ^{i}x̣, ʔá·^{y}ʔ^{i}x̣] ‘crab’; /x̣áwʔs/ → [ʔá·ʔ^{u}s, ʔá·^{w}ʔ^{u}s] ‘new’; /tə́hʔ/ → [táʔ^{a} ‘undergo); and in the environment of a following consonant cluster, this reflex becomes dominant (for instance, in /šáwʔcq/ → [šá·ʔocq] ‘bony-faced’).

Thus, the evidence indicates that underlying glottalized resonants in Squamish, and especially those in intervocalic position, surface as pre-glottalized. This tendency can be used to explain why a root like /həwʔít/ ‘rat’ ([həʔwit] after glottal restructuring) surfaces with stress on the final syllable even though it appears to have weight in the penultimate syllable. After restructuring takes place, the resonant (/w/) is no longer adjacent to schwa in the leftmost syllable and cannot lend its weight to that syllable. The glottal (which now follows the schwa) is parsed into the second onset position, and because /ʔ/ is classed with the obstruents rather than with the resonants, the preceding syllable is left without moraic content, rendering it unavailable for stress.

4.5. Chapter summary

This chapter has dealt with fundamental issues about the moraicity of segments and about the way strings are parsed into syllables and syllables into feet. The chapter revealed in part that resonant and obstruent consonants differ in several important ways that impact stress: first, they differ in that, although all coda consonants have weight-potential, resonants are more likely to be bearers of weight than obstruents are; and second, they differ in that, unlike intervocalic obstruents, which serve as onsets, resonants are typically parsed into codas. In combination, these factors explain why a root like /k^{w}ə́laš/ (syllabified /k^{w}ə́l.aš/, but with /l/ also doubling as onset) surfaces with stress on the penultimate syllable, while a root like /səpiq/ (syllabified /sə.píq/) surfaces with final stress.

Chapter 5

Stress in polymorphemic words involving prefixation

5.0. Introduction

Chapter 3 was an exercise in discovering what drives stress in Squamish at the most basic level. The examination, in the first part of that chapter, of the stress patterns found in bare roots of the language afforded evidence pointing to a hypothesis that Squamish stress falls on the penultimate syllables of words. Contravening this trend, the preliminary examination of stress in various types of morphological concatenations in the second part of Chapter 3 showed that polymorphemic words frequently do not surface with penultimate stress, and it was suggested there that this was due at least in part to the intervention of accent-related morphological factors in the stress process. The more detailed investigation undertaken in Chapters 5 through 7 shows that, in fact, a much larger factor in the assignment of stress to polymorphemic words is that of prosodic domains; this is especially evident in the analysis of suffixed forms in Chapters 6 and 7, where suffixes are found to occupy space in the four domains of phonological root, phonological stem, phonological word, and phonological phrase. However, the notion of prosodic domains also plays an important role in the analysis of stress in prefixed forms, undertaken in the current chapter, where both the unstressability of non-reduplicative versus reduplicative prefixes and the different stress patterning observed in CVC- versus CV- reduplicative forms are argued to be either wholly (in the first instance) or partially (in the second) attributable to prosodic domains.

That it is necessary to distinguish between prosodic and morphological/grammatical structure at some level of lexical analysis has been recognized for some time; see, for instance, Aoki (1966), Dixon (1977), Liberman and Prince (1977), Booij (1983), Booij and Rubach (1984), Nespor (1986), Nespor and Vogel (1986), Selkirk (1980), McCarthy and Prince (1986), all of whom recognize the existence of a prosodic lexical entity, typically referred to as a phonological word or a prosodic word, that is distinct from (usually smaller than) the grammatical word. Motivation for the phonological/prosodic word as a distinct category comes in part from observations that phonological rules and generalizations frequently do not apply across an entire grammatical word, but only to a designated portion thereof; in other cases, they have been argued to extend beyond the grammatical word to include, for instance, clitics. A typical prosodic hierarchy is one that includes at least the following constituents (based on Selkirk 1980).

(1) Phonological utterance
|
Intonational phrase
|
Phonological phrase
|
Phonological word
|
Foot
|
Syllable

In more recent work (for instance, in Inkelas 1993; Czaykowska-Higgins 1996, 1998; Downing 1999; Shaw 2004a, 2004c), researchers have argued for one or more levels of lexical substructure below the phonological word and above the sublexical levels of foot and syllable. For instance, Inkelas (1993) proposes the hierarchy in (2), which differs from the more traditional view in (1) in that it posits that the prosodic word dominates two additional lexical categories, namely the phonological stem and the phonological root.

(2) P-Hierarchy (adapted from Inkelas 1993:80)[1]

```
              Utterance
                  |
          Intonational phrase          Post-lexical
                  |
          Phonological phrase
                  |
----- Phonological word ---------------
                  |
          Phonological stem            Lexical
                  |
          Phonological root
```

The evidence for additional lexical categories in prosodic structure is based on observations that phonological rules and generalizations sometimes require reference to more than one prosodic domain below the level of the phonological phrase and outside that of metrical structure (syllable, foot), which, according to Inkelas, exists as a hierarchy that is separate and distinct from that of P-structure. For instance, Czaykowska-Higgins (1996, 1998) bases her conclusion of a tri-level prosodic representation of Moses-Columbian words on combined evidence from the phonological process of retraction and from stress assignment in the language.

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[1]Inkelas represents sublexical material dominated by the Phonological word as two strata labelled "β" and "α", which are here denoted as "Phonological stem" and "Phonological root", respectively; see also Downing (1999).

According to Czaykowska-Higgins, in Moses-Columbian the occurrence of retraction, in which alveolars and vowels are pronounced with a retracted tongue root, is predictable for affixes, to which it spreads from roots, where it is unpredictable. However, the manner of retraction spread is not uniform in different configurations of Moses-Columbian words (prefixal, suffixal, roots). For instance, within a root, retraction spreads from right to left, but not vice versa: while there are roots in the data that contain retracted segments in the leftmost portion of the word but not in the rightmost portion, the reverse is never true. In contrast, the spread of retraction to suffixes is progressive, proceeding from the root to the rightmost suffix. In prefixes, as in roots, spreading is regressive. However, unlike in roots and suffixes, where retraction spread is obligatory, in prefixes, spread is optional.

These three different ways in which retraction manifests itself in Moses-Columbian words argues for three domains of prosodic analysis: one which constitutes the phonological root, where retraction is unpredictable and its spread regressive and obligatory; one which subsumes the phonological root and all suffixes, in which domain the spread of retraction is progressive and obligatory; and one which includes prefixes in addition to the root–suffix combination, since prefixal retraction occurs only optionally. Czaykowska-Higgins terms these three levels of prosodic analysis the phonological root, the phonological stem, and the phonological word, respectively; these prosodic domains can be depicted as in (3).

(3) $[_{PW}$ Prefixes $[_{PS}$ $[_{PR}$ Root$]_{PR}$ Suffixes$]_{PS}$ $]_{PW}]$[2]

[2]This depiction is meant to be general. It should be noted that, citing evidence from stress facts, Czaykowska-Higgins argues that the phonological root contains reduplicative suffixes in addition to the morphological root.

In contrast to sublexical prosodic units, such as the syllable and the foot, which are often seen to span across morpheme boundaries, most researchers agree that the boundaries of prosodic domains such as the phonological word, the phonological stem, and the phonological root must correspond with morphological boundaries. However, and there is widespread agreement on this as well, it is frequently the case that the boundaries between morphological and prosodic domains are not isomorphic (with each other). For instance, Czaykowska-Higgins (1996, 1998) claims that in Moses-Columbian aspectual prefixes are contained within the morphological stem but are outside the phonological stem, that out-of-control and characteristic reduplicative suffixes form part of the phonological root even though they are obviously not part of the morphological root, and that although all lexical suffixes are part of the phonological stem, only the subset of nonreferential lexical suffixes are found in the morphological stem, while referential suffixes belong to the morphological word. The non-isomorphism of morphological and phonological domain boundaries in Moses-Columbian words is illustrated in (4).

(4) Structure of words in Moses-Columbian (Czaykowska-Higgins 1998:154)

a. Morphological Structure

$[_{MW}$ ASP $[_{MS}$ LOC RED $[_{MR}$ √ROOT$]_{MR}$ RED PA LS$]_{MS}$ LS TR O S $]_{MW}$
ITR ASP

b. Phonological Structure

$[_{PW}$ ASP LOC RED $[_{PS}$ $[_{PR}$ √ROOT RED$]_{PR}$ PA LS LS TR O S$]_{PS}$ $]_{PW}$
ITR ASP

A preview of the results of the analysis of prefixed and suffixed forms in this chapter and the one that follows it shows that in Squamish, as in Moses-Columbian, there are mismatches between the morphological and phonological structures of words. The structure I propose for Squamish is that in (5).

(5) Structure of Squamish words

a. Morphological Structure

$[_{MW}$ PRE $[_{MS}$ RED RED $[_{MR}$ $\sqrt{}$ROOT$]_{MR}$ LS LS$]_{MS}$ GS etc.$]_{MW}$

b. Phonological Structure

$[_{PP}$PRE $[_{PW}[_{PS}[_{PR}$RED$]_{PR}$ $[_{PS}[_{PR}$RED $\sqrt{}$ROOT$]_{PR}$ LS$]_{PS}]_{PS}$ $[_{PS}[_{PR}$LS$]_{PR}]_{PS}]_{PW}$ GS$]_{PP}$

In (5), phonological phrase (PPhrase) boundaries in (b) coincide with those of the morphological word (5a). Non-reduplicative prefixes and the majority of grammatical suffixes, both situated within the morphological word, are taken as existing outside the phonological word (PWord) in the PPhrase, while reduplicative prefixes and lexical suffixes, which are part of the morphological stem, are found in the PWord. Both reduplicative prefixes and lexical suffixes are split as far as domain residence is concerned: while CVC- reduplicants and compounding lexical suffixes are the sole occupants of PRoot positions within separate PStems, CV- reduplicants and incorporating lexical suffixes share the same PStem (and in fact, CV- reduplicants share the same PRoot) as that occupied by the morphological root.

The domains analysis I propose here for lexical suffixes is in contrast to Watt (2001), who argues that the way stress surfaces in Squamish words involving “strong suffixes” (that is, lexical suffixes that combine with roots to form compound structures) is best analysed in terms of a direct mapping between syntax and phonology. Watt’s claim, which concerns a subset of Squamish word configurations, is based on the assumption that there is exact correspondence between morphological and phonological boundaries (see also Watt 2000, Bar-el and Watt 2000). In contrast, the analysis in these chapters, which extends to words involving a variety of suffixal and prefixal forms, indicates that there are instances where isomorphism cannot be assumed, specifically, those outlined in (5) and the discussion that follows it.

The remainder of this chapter is given to an analysis of prefixed forms. Preliminary data sets of Squamish words involving prefixation are provided in (6-7), where the words in (6) are concatenations containing non-reduplicative prefixes, while those in (7) contain reduplicative prefixes of two types, namely, CVC- reduplicants in (7a) and CV- reduplicants in (7b).

(6) Non-reduplicative prefixation

nəxʷ-táʔ	‘(go) by way of’ (nəxʷ- ‘on, in, at, over (a surface), by way of’)
nəxʷ-ʔə́nča	‘(go) by what way/means?’
txʷ-námʔ	‘go, move along’ (txʷ- indicates direction)
txʷ-pə́lqʷ	‘fall on one’s knees’
ʔəs-q’ʷúy	‘sick’ (ʔəs- ‘one which X-es or is X-ed’)
ʔəs-mə́nʔ	‘give birth’
ti-náʔ	‘be from’ (ti- ‘from; hither’)
ti-lə́lʔs	‘from below’
tut-nəxʷ-č’ít	‘a little closer’ (tut- ‘a little (distance)’)

(7) Reduplicative prefixation

a. CVC- reduplication

təc-tíc	‘skinny’	šm-šám	‘run aground’
məx̣-míx̣aɬ	‘black bear; pl.’	ʔl-ʔə́li	‘to dream’
x̣ə́č-x̣əč	‘remember’	qʷə́l-qʷl	‘talk excessively’

b. CV- reduplication

c’í-c’iq	‘leak’	k’ʷá-k’ʷayʔ	‘be very hungry’
t’á-t’ayaq’	‘be angry’	ʔí-ʔimaš	‘take a walk, be walking’
q’ʷə́-q’ʷtq	‘pass by’	sə́-slqʷ	‘be sad, lonesome’

The data in (6-7) exemplify the way stress patterns in polymorphemic words resulting from prefixal processes. Specifically, the examples in (6) show that grammatical prefixes never bear stress,[3] even when affixed to a schwa-based root. In contrast, the reduplicative prefixes in (7) can and do bear stress: however, the outcome of stress varies depending on the type of reduplication, with CV- reduplicants (7b) always ending up with stress, and CVC- reduplicants (7a) being stressed in combinations with schwa-based roots, but not in those where the root contains a full vowel.

The difference between reduplicative and non-reduplicative prefixes in terms of availability for stress is the primary indicator that these main prefix categories must be given differential treatments in the analysis. The two prefix types cannot reasonably be differentiated on the basis of whether they are grammatical or have lexical content (grammatical information is expected to be found outside the lexical core of the word), as the class of non-reduplicative prefixes, situated at the extreme left edge of the word, consists primarily of prefixes with meaning associations, for instance, prefixes indicating location or directionality, as well as including a few derivational prefixes like the /s-/ nominalizer (exemplified by /s-√ɬə́nʔ/ 'woven material, mat', from the verbal root meaning 'to weave').[4] Reduplicative prefixes, on the other hand, carry mostly grammatical meaning (for instance, plurality in /məx̣+√míx̣aɬ/ 'black bear; pl.'). However, the reduplicant itself forms part of the lexical core in a way that the other prefixes do not: for instance, when both reduplicative and non-reduplicative prefixes are present in a word, the reduplicant is treated as part of the stem or base for prefixation; thus, the nominalizing /s-/ prefix is

[3]Kuipers (1967) lists as prefixes two morphemes that are exceptional in this regard. It is my opinion, however, that these morphemes are not prefixes but bound roots; this question is addressed in section 5.2.2 of this chapter.

[4]Aspect is mainly indicated by means of clitics.

situated outside the reduplicative form in /s-təq+√taqíw/ ‘horse; pl.’ (cf. the singular form /s-√taqíw/). The fact that non-reduplicative prefixes never bear stress indicates that they are outside the domain for stress (as has been suggested elsewhere).

In what follows, I analyse the stress patterns found in Squamish words resulting from non-reduplicative prefixation in section 5.1, while stress in forms resulting from CVC- and CV- reduplicative prefixation is analysed in section 5.2.

5.1. Stress in words involving non-reduplicative prefixes

5.1.1. Unstressable prefixes

With two exceptions (see section 5.1.2), non-reduplicative prefixes, which for the most part are associated with meanings related to location or directionality (although some, like the nominalizer /n-/, are grammatical) are neither stressed nor stressable in Squamish. Examples of Squamish words with unstressable non-reduplicative prefixes are listed in (8).

(8) Unstressable non-reduplicative prefixes

nəx^{w}-táʔ	‘(go) by way of’	s-tx^{w}-nánamʔ	‘be gone’
ʔəs-č’ə́qč’əq	‘dirty’	ʔəs-c’əx^{w}c’íx^{w}	‘helpful’
ʔəs-q’^{w}úq’^{w}uł	‘prepared’	ʔəs-tə́tx̣^{w}	‘prepared’
ti-náʔ	‘be from’	ti-lə́lʔs	‘from below’
ti-ʔə́nča	‘be from where’	tut-nəx^{w}-č’ít	‘a little closer’

The examples in (8) show that all but two (specifically, /ti-/ ‘from, hither’[5] and /tut-/ ‘a little (distance)’) of the non-reduplicative prefixes either contain schwa and have the

[5]In addition, Kuipers (1967) also has /ti-/ ‘to make, build, produce’ as a prefix, for instance, in /ti-√lámʔ/ ‘build a house’, /ti-√mə́nʔ ‘produce offspring’; rather than being a prefix, this is probably a bound root (cf. /taʔ-s/ ‘to make, build, construct; tr.’).

shape CəC (for instance, /nəx^{w}-/) or are vowelless and have a CC shape (for instance, /tx^{w}); in fact, all but two (namely, /ti-/ and, of two personal affixes that are prefixal, the 2nd person singular possessive form[6]) constitute a closed syllable in shape. As well, like all prefixes in Squamish, they are monosyllabic. Regardless of whether they contain a full vowel or schwa, or are vowelless, non-reduplicative prefixes do not bear stress under any circumstances, not even when a prefix with a full vowel is affixed to a stem that is entirely schwa-based (for instance, /ti-lə́lʔs/ 'from below').

It is plain that phonological factors alone, for instance, those utilized in the analysis of roots, will not yield an accurate account of stress in words containing non-reduplicative prefixes. If they did, a word like /ti-náʔ/ 'be from' would surface with stress on the penult (which is the syllable occupied by the prefix), thus the unacceptable */tí-naʔ/. Furthermore, it will be noted that the prefix is always attached immediately to the left of a root, as in /nəx^{w}-√táʔ/, or a reduplicated stem, as in /ʔəs-c'əx^{w}+√c'íx^{w}/, and that the word may include more than one non-reduplicative prefix, as in /tut-nəx^{w}-√č'ít/.

Since non-reduplicative prefixes are never stressed, they are clearly outside the domain of the prosodic word. Ensuring the correct stress outcomes for words with these prefixes can be achieved by means of a constraint that aligns a prosodic stem with a

[6]The other is /ʔn-/, which indicates 1st person singular possession.

prosodic word; the constraint in (9) is based on Rowicka (1999; see also McCarthy and Prince 1993b).[7]

(9) ALIGN-WD-ST
Align (PrWd, L, PStem, L)
The left edge of every prosodic word coincides with the left edge of some prosodic stem.

Two other constraints are necessary to account for the way stress surfaces in words containing non-reduplicative prefixes. The first of these, stated in (10), is responsible for aligning the left edge of a root with the left edge of a prosodic stem. The constraint in (10), based on Bar-el (2000),[8] recognizes the fact that roots always occupy the leftmost position of a prosodic stem.

(10) ALIGN-RT-ST
Align (PRoot, L, PStem, L)
The left edge of every prosodic root coincides with the left edge of some prosodic stem.

To prevent the unstressable non-reduplicative prefix from being footed, which would permit it to be considered for stress, it is necessary also to invoke a constraint aligning the left edge of a foot with the left edge of the prosodic word; see (11).

(11) ALIGN-WD-FT
Align (PWord, L, Foot, L)
The left edge of every PWord coincides with the left edge of some foot.

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[7]The constraint utilized here is to be differentiated from McCarthy and Prince's (1993b) ALIGN-LEFT, which aligns the left edge of *every stem* with that of *some prosodic word*.

[8]Bar-el's (2000:12) version reads:
ALIGN-L (ROOT, PS)
Align the left edge of the root with the left edge of the Prosodic Stem.

Adding these constraints to phonological constraints utilized in the analysis of roots now permits a correct assessment of stress in words containing non-reduplicative prefixes; this is illustrated in the following tableaux, which analyse a prefixed monosyllabic root in (12) and a prefixed disyllabic root in (13). In order to get the desired stress outcome, it is essential that both ALIGN-WD-ST and ALIGN-RT-ST dominate FTBIN-σ; however, it is not certain how these constraints are to be ranked relative to each other or to ALIGN-WD-FT.

(12) /tináʔ/ 'be from'

/ti - √naʔ/ [$_{PP}$ ti- [$_{PW}$ [$_{PS}$ √naʔ]]]	ALIGN-WD-ST	ALIGN -RT-ST	ALIGN-WD-FT	FTBIN -σ	FTFORM= TROCHEE	PARSE -σ
a. [$_{PW}$ (tí- [$_{PS}$ naʔ)]]	*!		*			
b. [$_{PW}$ [$_{PS}$ (tí- naʔ)]]		*!	*			
c. [$_{PW}$ [$_{PS}$ (ti- náʔ)]]		*!	*		*	
☞ d. ti- [$_{PW}$ [$_{PS}$ (náʔ)]]				*		*

In (12), candidates (a) and (b, c) are ruled out by ALIGN-WD-ST and ALIGN-RT-ST, respectively, leaving candidate (d) to emerge the victor. The analysis in (12) thus shows that the best configuration for a disyllabic word involving a non-reduplicative prefix is one that obeys constraints aligning root with PStem, and PStem with PWord.

When the root is disyllabic, as is the case in /ti-√ʔə́nča/, the eventual outcome of stress in the word is determined by the lower-ranked FTFORM=TROCHEE. Thus, in tableau (13), the favoured candidate is (d), which optimally aligns the root with a PStem and a PWord, and which posits a wellformed, trochaic foot on the root. Recall from Chapter 3 that ALIGN-RT-FT is responsible for ensuring that the right edge of every root coincides with the right edge of a foot.

(13) /tiʔə́nča/ ‘be from where’

/ti- √ʔnča/ [$_{PP}$ ti- [$_{PW}$ [$_{PS}$ ʔnča]]]	ALIGN-WD-ST	ALIGN-RT-ST	ALIGN-WD-FT	FTBIN-σ	ALIGN-RT-FT	FTFORM=TROCHEE	PARSE-σ
a. [$_{PW}$ ti- [$_{PS}$ (ʔə́nča)	*!		*				*
b. (tí- [$_{PW}$ [$_{PS}$ ʔən)čá		*!	*		*		*
c. (ti- [$_{PW}$ [$_{PS}$ ʔə́n)ča		*!	*		*		*
☞ d. ti- [$_{PW}$ [$_{PS}$ (ʔə́nča)							*
e. ti- [$_{PW}$ [$_{PS}$ (ʔənčá)						*!	*
f. (ti- [$_{PW}$ [$_{PS}$ ʔənčá)				*!		*	

In (13), candidates (a) and (b, c) are eliminated by ALIGN-WD-ST and ALIGN-RT-ST, respectively, and candidate (f), which posits a single foot on the trisyllabic form, is ruled out by FTBIN-σ. The only difference between the two remaining candidates is that (e) posits an iambic foot, while (d) posits a trochee; since a trochaic foot is preferred, candidate (d) wins.

The analysis in this section has shown that in order to get the correct stress results for words involving non-reduplicative prefixes, it is necessary to posit these prefixes as being located outside the prosodic stem (and therefore also outside the prosodic word, since every PStem is situated at the left edge of a PWord). The analysis requires reference to various prosodic domains, and the configuration in (14) is advocated.

(14) Prosodic domains for non-reduplicative prefixation in Squamish
[$_{PP}$ PREFIX- [$_{PW}$ [$_{PS}$ [$_{PR}$ √ROOT]]]]

This analysis assumes that the prosodic word is the domain for stress. Prefixes like the non-reduplicative ones analysed here are plainly outside the PWord domain, therefore, in the next higher level, namely, the PPhrase. The schema in (14) shows the left PWord boundary as coinciding with the left edges of both PStem and PRoot: this follows from the constraints ALIGN-WD-ST (9) and ALIGN-RT-ST (10), both invoked in this section.

5.1.2. Stressable non-reduplicative prefixes or bound roots?

Although the majority of non-reduplicative prefixes in Squamish are never stressed, as was seen in the previous section, two morphemes identified as prefixes by Kuipers (1967) do not fall into this category. Examples of words containing these morphemes (underlined) are listed in (15).

(15) Stressable non-reduplicative prefixal morphemes

a. /ʔa-/ (reduced /ʔə-/; reduplicative /ʔaʔ-/)

s-ʔə-√k^{w}láš	'gun'	s-ʔáʔ-√k^{w}laš	'be wounded'
s-ʔə-k^{w}á+√k^{w}laš	'to wound'	ʔaʔ-tqáč	'eight (animals)'
ʔə-√x̣íc	'lie (down)'	s-ʔaʔ-√x̣íc	'be lying down'
s-ʔá-t+√tam	'things, stuff'	n-s-ʔa-č+√čáwam	'conger eel'

b. /ʔi-/

ʔí-√p'i-s	'take, hold; tr.'	ʔi-√p'aʔ-ímʔ	'hold s.t. (in the hand); itr.'
ʔi-p'áq'^{w}aɬ	'be afraid'	(ʔi+)ʔi-p'áq'^{w}aɬ-nit	'become afraid of'

The data listed in (15) show that, in contrast to the prefixes discussed in the previous section, /ʔa-/ and /ʔi-/ are fully stressable. Not only are these morphemes stressable, but they are also capable of being reduplicated; as a rule only roots are subject to reduplication. In these ways, /ʔa-/ and /ʔi-/ resemble roots more than prefixes in their behaviour, and it is suggested here that they are bound roots rather than prefixes.

Further evidence pointing to this conclusion is found in nominalized forms, where the nominalizer, /s-/, is always situated to the immediate left of the morphemes in question (in either their plain or their reduplicative form); examples are /s-ʔə-√kʷláš/ ‘gun’, /s-ʔaʔ-√x̣íc/ ‘be lying down’, and /n-s-ʔa-č+√čáwam/ ‘conger eel’. Based on these observations, I take the position that /ʔa-, ʔi-/ are bound roots rather than prefixes. As bound roots, they are part of a compound structure with the root that follows; as such they would presumably be subject to rules that govern stress assignment in compound constructions[9]; however, I do not analyse them further here.

5.2. Reduplicative prefixes

As is commonly found in Salishan languages, reduplication is widespread and productive in the Squamish language, serving a variety of grammatical functions including, but not limited to, plurality, iteration, intensity, and distributive aspect in CVC- reduplicated roots, and continuous action[10] in CV- reduplicated roots (Kuipers 1967; see also Bar-el 2000, 2001[11]). With the exception of a few isolated cases of apparent[12] final (V)C reduplication

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[9]Although compounding of free forms is not productive in Squamish (Kuipers 1967), in some formations a compound-like relationship exists between a lexical suffix (for instance, /=wiɬ/ ‘container’) and a root that modifies it; see Chapter 6, section 6.2.

[10]CV- reduplication can also indicate diminutive; however, there are few examples in the Kuipers corpus, and Bar-el (2000) indicates the process is not productive in Squamish.

[11]Bar-el (2000) takes the position that productive CVC reduplication as a whole denotes plurality: whereas CVC-reduplicated nouns indicate plural individuals, CVC-reduplicated verbs indicate plural events.

[12]“Apparent” because it is frequently not clear whether a particular word is the result of a reduplicative or a suffixal process; for instance, as (Kuipers 1967:108) points out, /√t’č-áč/ ‘walking-staff’ has the appearance of being a case of final reduplication but could equally well be conceived of as a combination of /√t’əč/ (which, however, was not recorded in isolation) and the lexical suffix /=ač/ ‘hand’.

(as exemplified by /wəq’ə́q’/ ‘snail’, /kílala/ ‘butterfly’), reduplication in Squamish is prefixal.

In phonological terms, Squamish exhibits two main types of prefixal reduplication, namely, CVC- reduplication (referred to by Kuipers 1967 as “total” reduplication) and CV- reduplication (Kuipers’ “partial” reduplication). A very few cases exist where both CVC- and CV- reduplicants are present in a word, resulting in double reduplication.

Complex forms stemming from the application of CVC- and CV- reduplication exhibit markedly different stress patterns in that stress falls on the reduplicant in CV- reduplication (for instance, in /ʔíʔimaš/ ‘be walking’; cf. /ʔímaš/ ‘walk’), but on the root (schwa-based roots are an exception) in CVC- reduplication (for instance, stress is on the root in /ləmlámʔ/ ‘house; pl.’, but on the reduplicant in /t’ə́mt’əm/ ‘snowbird; pl.’). Bar-el (2000) attributes this variance in stress to differences in the quality of the vowel in the reduplicant, positing that CV- reduplication involves a verbatim copy of the initial two segments of the base, and CVC- reduplication, a copy of the first two consonants of the base with attendant schwa-epenthesis in the reduplicant. The CV- reduplicant has a full vowel in all cases where a full vowel exists in the base, in contrast to the CVC- reduplicant, which is always schwa-based. If, as held by Bar-el (see also Bar-el and Watt 1998), default stress falls on the leftmost full vowel of Squamish words (in contrast to the analysis here, which indicates that stress falls on a penultimate syllable with weight), the observed variation in stress between CV- and CVC- reduplicated forms is predictable in a general sense, although there exist cases, especially of CV- reduplication, where a schwa in the reduplicant is stressed in the presence of a full vowel elsewhere in the word (for instance, in /x̣ə́x̣ic'm/ 'to itch'; cf. /x̣əx̣əhám/ 'be crying').[13]

Clearly, the two types of reduplication have different effects on stress, not all of which can be explained in terms of vowel quality. For instance, while the addition of a CVC- reduplicant has no impact whatsoever on the way stress patterns in the word as a whole (except, as mentioned, when the only vowel in the base for reduplication is schwa), the addition of a CV- reduplicant virtually always results in a re-configuration of stress in the word; for instance, although primary stress is on the initial syllable of the root in /ʔímaš/ 'walk', it is on the reduplicant in /ʔíʔimaš/ 'be walking', with a possible secondary stress on /a/ in the final syllable of the root, but no stress on /i/ in the initial root syllable.

Not only do these distinct reduplicant types exhibit different stress effects, but they clearly also differ in shape and size. For instance, the CVC- reduplicant holds the shape of the majority of roots in Squamish (see Chapter 2, section 2.2), while the CV- reduplicant has the size of a canonical syllable.[14] This distinction forms an important part in the analysis of stress in reduplicated forms here, where the stress difference between CVC- and CV- reduplicated stems is taken as resulting in part from the categorization of the former with roots (which they resemble), and the latter with affixes, and in part from differences in domain configuration. As roots (or rootlike entities), CVC- reduplicants occupy the leftmost position in a PStem; a CVC- reduplicative form therefore consists of two juxtaposed

[13]It should be noted that Bar-el (2000) is not intended as an analysis of stress in Squamish, but rather one of patterns of reduplication in the language.

[14]Bar-el (2000) analyses both CVC- and CV- reduplicants as root-shaped and syllable-sized.

(actually, recursive) PStems. As affixes, CV- reduplicants also occupy the leftmost position in a PStem, however, in this case, the same PStem as that occupied by the morphological root; since the root is leftmost in the stem, the CV- reduplicant is analysed as part of the PRoot itself.[15] In contrast to CVC- reduplicated stems, where stress is a matter of selecting the most stressworthy of competing stems, stress in CV- reduplicated stems involves no such competition. A CVC+CV+√ROOT order appears to be upheld in cases of double reduplication (for instance, in /ʔəx̣ʔíʔx̣in/ (ʔəx̣+ʔi+√ʔix̣-in) ‘call names, call down; tr.’ and /syəx̣ə́yx̣as/ (s-yəx̣+(y)ə+√yəx̣as) ‘large rocks’[16]), which are, however, admittedly in short supply.

The analysis of reduplicative forms proposed here veers from that advocated by Bar-el (2000) in two important ways. First, while Bar-el categorizes the two reduplicant types uniformly as roots, they are given different categories here, with CVC- being analysed as a root (in agreement with Bar-el) and CV-, as an affix. Second, while Bar-el analyses both reduplicant types as syllable-sized, they are classified differentially here, where it is argued that, as roots, CVC- reduplicants are foot-sized, and as affixes, CV- reduplicants are syllable-sized (the latter in agreement with Bar-el). The proposed analyses of CVC- and CV- reduplicants in terms of domains are indicated in (16a, b), respectively.

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[15]In her analysis of words in Moses-Columbian, Czaykowska-Higgins (1996, 1998) argues that reduplicative suffixes in that language form part of the phonological root (reduplicative prefixes, which are never stressed in Moses-Columbian, are outside the phonological stem).

[16]Kuipers (1967) also lists /yəx̣yəx̣ás/ (yəx̣+√yəx̣as), with only plural reduplication, as an alternative to this form.

(16) Prosodic analysis of CVC- and CV- reduplication in Squamish
a. CVC- reduplication
$[_{PW}\ [_{PS}\ [_{PR}$ RED-] $[_{PS}\ [_{PR}$ √ROOT]]]]
b. CV- reduplication
$[_{PW}\ [_{PS}\ [_{PR}$ RED- √ROOT]]]

Taken as a whole, the factors outlined here allow for a straightforward explanation of why stress patterns as it does in CVC- and CV- reduplicative forms. I analyse stress in reduplicative forms stemming from these two reduplication types individually in the following sections.

5.2.1. CVC- reduplication

Prefixal CVC- reduplication in Squamish appears to interact crucially with root class for the purposes of stress assignment in that stress falls on the root when it contains a full vowel, but on the prefix when the root contains schwa. Examples of CVC- reduplication in combinations with roots containing at least one full vowel are given in (17), while (18) lists examples of combinations with schwa-based roots.

(17) CVC- reduplication based on roots with full vowels

a. Monosyllabic root (stress on root)

təc+√tíc	'skinny'	yəɬ+√yúɬ	'burn; itr.'
šəm+√šám	'run aground'	ləm√lámʔ	'houses'

b. Disyllabic roots (stress on root)

kʷəp+√kʷúpic	'elder siblings'	t'əq+√t'áqaʔ	'be bruised all over'
məx̣+√míx̣aɬ	'black bears'	ʔəl+√ʔə́li	'to dream'
s-təq+√taqíw	'horses'		

c. Exceptions

mús+√məs	'cow'	c'íxʷ+√c'əxʷ	'black eagle'
s-x̣ʷáy+√x̣ʷay	'Stanley Park Lighthouse'		

The exemplary data in (17) show that, with few exceptions, a full-vowel root is always the bearer of stress in simple CVC- reduplicative forms. The examples listed in (17a, b), in which the role of the reduplicative prefix is generally augmentative, are typical of the vast majority of concatenations with this type of productive CVC- reduplication in Squamish. Exceptions, such as those found in (17c), which stress the reduplicative prefix even with strong roots, tend to refer to names of places, animals, birds, and the like, and constitute a type of reduplication sometimes referred to as "characteristic" reduplication (van Eijk 1998; see also work by Czaykowska-Higgins 1993b on Moses-Columbian, by Montler 1986 on Saanich, and by Thompson and Thompson 1992 on Thompson; in addition, see Shaw 2002b, 2004c).[17]

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[17]Words containing this type of reduplication are typically not easily analysable, as the root is frequently found neither in freestanding form nor in combination with other affixes. It should be noted that not all researchers recognize this type of reduplication as a separate semantic class; however, the data indicate that there exists more than just a semantic difference between augmentative and characteristic reduplication in Squamish: they also differ in where stress is placed in the word of which they are part, in that while strong roots retain stress in combinations with CVC- reduplicating prefixes with augmentative meaning, they lose stress to the CVC reduplicant under characteristic reduplication. This implies that two types of reduplication are involved: perhaps characteristic reduplication is suffixal rather than prefixal. Needless to say, this stress distinction is not found in combinations with weak roots, where the reduplicant is stressed in any case. It should be noted for the record that the quantity of Squamish data that can clearly be shown to fit into a semantic classification of characteristic reduplication is rather limited, nor is this reduplication type productive in Squamish.

If Bar-el (2000) is correct in positing the more common, productive type of CVC reduplication as involving a copy of the first two consonants of the root coupled with a default vowel insert (see subsequent discussion in this section), then the reduplicant for the type described here must presumably be specified in terms of a copy of the initial CVC of the root (that is, the root vowel is copied as well as the consonants). As characteristic reduplication is not productive in Squamish, its analysis will not be undertaken in this dissertation.

In contrast to reduplicated stems involving roots with full vowels, where the root tends to bear the stress (17), reduplicated stems formed on schwa-based roots have stress on the reduplicant, as indicated by the forms in (18).

(18) CVC -reduplication based on root with schwa

a. Monosyllabic weak root (stress on reduplicant)

s-x̣^{w}ə́nʔ+√x̣^{w}ən	‘legs’	q^{w}ə́l+√q^{w}əl	‘talk excessively’
ʔəs-č’ə́q+√č’əq	‘dirty’	x̣ə́č+√x̣əč	‘remember’
k’^{w}ə́ɬ+√k’^{w}əɬ	‘spill repeatedly; itr.’		

b. Exceptions

qəl+√qə́lʔ	‘spoil; itr.’

The data in (18) show that when the base for reduplication is a monosyllabic schwa-based root, it is the reduplicative prefix and not the root that is the bearer of word stress; this is in direct contrast to what transpires in combinations with strong monosyllabic roots (the exception listed in 18b is anomalous). Examples of reduplications based on disyllabic weak roots (that is, disyllabic roots with no full vowels, only schwa) were not found in the Kuipers corpus.

From an examination of the representative data in (17-18) it is evident that, if nothing else, CVC- reduplication involves the minimal copy of the first and second consonants of the root, as they appear verbatim in the reduplicant. Moreover, the vowel of the reduplicant is predictably schwa. This could mean one of two things: either the full vowel is copied from the base and is subsequently reduced to schwa, as is frequently the case in unstressed syllables in Squamish (and throughout Salishan, as well as cross-linguistically), or the copy is strictly one of consonants, and epenthetic schwa intervenes between the copied segments in the reduplicant. The latter view is the one taken by Bar-el (2000). However, it is a matter of note that (rather unexpectedly, given the somewhat temporal nature of surface schwa elsewhere in the word) the default vowel is never missing in the reduplicant (although, as elsewhere in his transcriptions, Kuipers habitually omits it from transcriptions in which the second consonant is a resonant, which is syllabic following a tautomorphemic consonant).

In the analysis of stress in CVC- reduplicative forms undertaken here, I adopt in principle Bar-el's (2000) theoretical analysis of the CVC- reduplicant, differing from her mainly in that I take ROOT as being equal to FOOT rather than SYLL, and in that I assume recursive stems for the reduplicant and the morphological root rather than a single prosodic stem structure for the combination. A dual stems analysis is a logical extension of Bar-el's analysis, as I will show.

As already mentioned, the shape of the CVC- reduplicant is that of the canonical root in Squamish; in this, and in the fact that it is schwa-based, the reduplicant also resembles the majority of non-reduplicative prefixes, analysed in section 5.1. However, unlike non-reduplicative prefixes, which are never stressed, the CVC- reduplicant surfaces with stress when attached to a schwa-based root; compare, for instance, /ʔəs-√t'ə́q'ʷ/ 'broken-off piece' (literally, 'that which is broken off') and /x̣ə́č+√x̣əč/ 'remember'. Bar-el (2000) uses the shape similarity between reduplicant and root and the stress differences between reduplicative and non-reduplicative prefixes to argue that the CVC- reduplicant is a rootlike entity and thus subject to constraints on roots rather than to constraints on affixes.

The idea that CVC- reduplicants in Squamish must be analysed as roots follows a claim by Urbanczyk (1996[2001]) for Lushootseed that for analytical purposes the distributive (CVC-) reduplicant in that language must be considered a root and not an affix.[18] Urbanczyk uses the root ~ affix dichotomy to distinguish between CVC- and CV-/-VC reduplicants in Lushootseed, positing that the former are rootlike, and the latter affixlike, in their behaviour.[19] With regard to the different ways in which the two are analysed in OT, Urbanczyk states:

> The existence of Root-Faith and Affix-Faith coincides with the quest for general conditions in reduplicative identity. It presupposes that constraints evaluate a *class* of strings. If a string is affixal, it is subject to Affix-Faith; similarly, if a string is classified as a root, it is subject to Root-Faith (Urbanczyk 2001:59).

It is chiefly the shape of the reduplicant that underlies Urbanczyk's treatment of CVC-reduplicants as roots and CV-/-VC reduplicants as affixes, in part because they reflect the unmarked shape for roots and prefixes/suffixes, respectively, in Lushootseed. In an investigation of the shapes of non-reduplicative prefixes, Urbanczyk (2001:49ff) differentiates between bound-root and grammatical prefixes, noting that the shape of the former is generally CVC-, whereas that of the latter is CV-; she notes further that while grammatical, or CV-, prefixes are never stressed in Lushootseed, bound-root, or CVC-, prefixes can be. This difference in prefix shape forms in large part the rationale behind Urbanczyk's classification of the Lushootseed distributive as a root. This rationale cannot, however, be used to argue for the rootlike status of CVC- reduplicants in Squamish, where almost all non-reduplicative prefixes, which are clearly outside the domain for stress, also have the CVC-shape; in fact, in contrast to Lushootseed, if a grammatical versus bound-root

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[18]This is an extension of a proposal by McCarthy and Prince (1994, 1995) that reduplicants are classifiable as either stems or affixes.

[19]In contrast, Bar-el proposes that in Squamish both CVC- and CV- reduplicants behave like roots; in addition to the discussion on CVC- reduplication in this section, see also that on CV- reduplication in section 5.2.2.

distinction can be drawn for non-reduplicative prefixes in Squamish, it is the forms suspected of being bound roots rather than the grammatical prefixes that exhibit the CV- shape (for instance, /ti-/ ‘build, produce’).

A second argument (utilized by both Urbanczyk for Lushootseed and Bar-el for Squamish) in favour of a roots analysis of CVC- reduplicants is that, like roots, they permit marked phonological structure, such as stressed schwa. While the Squamish reduplicant does condone marked phonological structure, it is not necessarily that found in morphological roots; for instance, in contrast to roots, where unstressed schwa regularly reduces to its zero form (or fails to surface at all), the CVC- reduplicant always surfaces with schwa, even when it is unstressed. Moreover, the fact that schwa in the reduplicant can bear primary word stress does not necessarily put it in a class with roots, since at least one grammatical suffix in Squamish is permitted to surface with stress on schwa when the root vowel is also schwa (for instance, in /cx̣ə́t/ ‘push; tr.’; see Chapter 7 for an analysis of stress in transitive forms).

Although the evidence for the rootlike status of the CVC- reduplicant is not as clearcut for Squamish as it is for Lushootseed, such an analysis of this reduplicant appears, nevertheless, to be justified, especially when the factor of shape is considered.

The morphological category of the CVC- reduplicant, then, can be stated as (19); see Bar-el (2000:12).

	Morpheme	Shape
(19)	Morpheme	Shape
	RED_1[20]	Morphological Category (MCat)=Root

[20]Bar-el identifies CVC- reduplicants as RED_1 and CV- reduplicants as RED_2.

The analysis of non-reduplicative prefixation in section 5.1 utilized the constraint ALIGN-RT-ST,[21] which situates a root in the leftmost position of a prosodic stem. As Bar-el points out, if reduplicants are analysed as roots then they too are optimally situated at the left edge of a prosodic stem; in other words, ALIGN-RT-ST holds for CVC- reduplicants as well as for roots.

Thus, a CVC- reduplicated stem will be analysed as in (20), where both the root and the reduplicant are evaluated in terms of ALIGN-L (ROOT, PS). The tableau in (20) repeats the analysis in Bar-el (2000) as far as the first three candidates are concerned; however, I have added candidate (d) to the list of candidates.

(20) Prefixal status of reduplicants (based on Bar-el 2000:12)

/RED$_1$ -təqew/ 'horses'		ALIGN-L (ROOT, PS)
	a. [$_{PW}$ s [$_{PS}$ **təq** təqew]]	*!**
	b. [$_{PW}$ s [$_{PS}$ təqew **təq**]]	*!****
	c. [$_{PW}$ **təq** s [$_{PS}$ təqew]]	*!***
☞	d. [$_{PW}$ s [$_{PS}$ **təq** [$_{PS}$ təqew]]]	✓

In Bar-el's analysis, violations against ALIGN-L (ROOT, PS) are incurred on a per segment basis. In the tableau, candidate (20a) correctly aligns the left edge of the reduplicant (= ROOT) with the left edge of the prosodic stem; however, the left edge of the morphological root is separated from that of the prosodic stem by the three segments contained in the reduplicant: three violations are thus incurred. When the morpheme order is reversed, as in (20b), five violations are incurred because, although the morphological

[21] Recall that ALIGN-RT-ST is based on Bar-el's (2000) ALIGN-L (ROOT, PS).

root is correctly aligned, the left edge of the reduplicant is five segments to the right of the left prosodic stem boundary. Similarly, candidate (20c) incurs four violations because the left edge of the reduplicant is located that many segments to the left of the stem. As mentioned, Bar-el considers only options (a-c), in which case the optimal candidate is (a), since it has the least number of violations of the first three candidates. However, a better candidate would be that in (d), which posits that root and reduplicant are both left-aligned in prosodic stems, as this candidate obeys the constraint in every respect.

The analysis of reduplicant and root as occurring in separate stems is further justified by observations that although the resonant in a CR sequence within a stem tends to be pronounced as syllabic, thus CR̩ (see Chapter 2, section 2.1.1.1), such syllabification is not permitted across the boundary between reduplicant and root; for instance, /s-mən+√mánit/ 'mountains' is never pronounced */s-mən+√m̩ánit/.[22]

The constraint ALIGN-RT-ST is similar to a constraint ALIGN-WD proposed in Cohn and McCarthy (1994) to account for the observation that reduplicative prefixes, but not non-reduplicative prefixes, are stressable in Indonesian. However, instead of aligning the root (like Bar-el, Cohn and McCarthy analyse a prefixal reduplicant as a root) at the left edge of a stem, they align it at the left edge of the prosodic word. That both the reduplicant and the morphological root must coincide with a left prosodic word edge in Indonesian is indicated by the observation that reduplicative forms tend to surface with two primary

[22]According to Kuipers (1967), casual speech permits syllabification across the boundary between the /s-/ nominalizer and the reduplicant or root (for instance, in /s-m̩ən+√mánit/ 'mountains'), but not between reduplicant and root.

stresses, one on the reduplicant and the other on the root (for instance, /hák-hák/ ‘rights’, /búku-búku/ ‘books; see Cohn and McCarthy 1994:32).

Unlike in Indonesian, a reduplicated stem (or for that matter, an entire word) in Squamish does not as a rule contain more than one primary stress,[23] and disyllabic reduplicated stems do not contain more than one stress of any degree; thus, stress falls either on the reduplicant, as in /qʷə́l+√qʷəl/, or on the root, as in /šəm+√šám/, but never on both. Clearly, in Squamish root and reduplicant are contained within a single prosodic word, and the analysis in (20) suggests that they occupy the leftmost position in recursive stems, as indicated in (21).

(21) Prosodic domains for CVC- reduplicative forms in Squamish
$[_{PW}\ [_{PS}\ [_{PR}\ \text{RED}]_{PR}\ [_{PS}\ [_{PR}\ \text{ROOT}]_{PR}\ ]_{PS}\ ]_{PS}\ ]_{PW}$

In conjunction with ALIGN-RT-ST, the analysis of stress in words involving non-reduplicative prefixes (section 5.1) utilized the additional constraints ALIGN-WD-FT, which specified that the left edge of a foot must coincide with the left edge of a prosodic word, and ALIGN-WD-ST, which called for alignment between the left edges of (some) prosodic stem and (every) prosodic word.

Adding ALIGN-RT-ST and ALIGN-WD-FT to the constraints that were previously utilized in the analysis of stress in morphological roots (Chapter 3) yields the correct results for some reduplicative forms, as shown by the tableau in (22), but not for others. (Note: all listed candidates are assumed to hold to the indicated prosodic root boundaries, which are consequently not shown for individual candidates.)

[23]Kuipers mentions one or two instances of words with two main stresses.

(22) /təctíc/ ‘skinny’

/RED + √tic/ [$_{PW}$ [$_{PS}$ [$_{PR}$ RED] [$_{PS}$ [$_{PR}$ √tic]]]]	ALIGN-RT-ST	ALIGN-WD-FT	FTBIN-σ	ALIGN-RT-FT	WSP′	FTFORM=TROCHEE	PARSE-σ
a. [$_{PW}$ (təc [$_{PS}$ tíc])]	*!			*		*	
b. [$_{PW}$ [$_{PS}$ (təc tíc)]]	*!			*		*	
☞ c. [$_{PW}$ [$_{PS}$ (təc [$_{PS}$ tíc)]]]				*		*	
d. [$_{PW}$ [$_{PS}$ (tə́c [$_{PS}$ tic)]]]				*	*!		
e. [$_{PW}$ [$_{PS}$ (təc) [$_{PS}$ (tíc)]]]			*!*			*	
f. [$_{PW}$ [$_{PS}$ (tə́c) [$_{PS}$ (tic)]]]			*!*		*	*	
g. [$_{PW}$ [$_{PS}$ təc [$_{PS}$ (tíc)]]]		*!	*	*			*
h. [$_{PW}$ [$_{PS}$ (tə́c) [$_{PS}$ tic]]]			*!	*	*		*

In the tableau, candidates (a, b) are ruled out as a result of their failure to provide the optimal alignment between root and stem, since (a) aligns only the morphological root, and (b) only the reduplicant, with the left prosodic stem edge. Candidate (g) is eliminated by ALIGN-WD-FT, and (e, f, h) by FTBIN-σ. The winning candidate, then, is (c), which beats out (d) by assigning stress to the only syllable with moraic weight (recall that full vowels have intrinsic weight in Squamish), whereas (d) leaves the syllable with weight unstressed. The fact that of these two candidates only (d) obeys FTFORM=TROCHEE is irrelevant because, as established in Chapter 3, the WSP′ outranks FTFORM=TROCHEE.

Although the WSP′ plays a crucial role in the outcome for /təctíc/, which has moraic weight only in one syllable, it does not in that for /šəmšám/ ‘run aground’, which contains weight in both syllables; recall from Chapter 3 that a schwa-based syllable has weight when schwa is immediately followed by a resonant. For this reason, the same configuration of candidates and constraints utilized in (22) would erroneously deem the (d) candidate optimal in (23) because it obeys FTFORM=TROCHEE; since every candidate incurs one violation of the WSP′ by assigning weight to only one of two syllables with weight, the WSP′ does not figure in the outcome. The inaccuracy of this analysis for /šəmšám/ is shown in (23).

(23) /šəmšám/ 'run aground'

/RED + √šam/ [$_{PW}$ [$_{PS}$ [$_{PR}$ RED] [$_{PS}$ [$_{PR}$ √šam]]]]	ALIGN -RT-ST	ALIGN- WD-FT	FTBIN -σ	ALIGN -RT-FT	WSP′	FTFORM= TROCHEE	PARSE -σ
a. [$_{PW}$šəm [$_{PS}$šám])]	*!			*	*	*	
b. [$_{PW}$[$_{PS}$(šəm šám)]]	*!			*	*	*	
→ c. [$_{PW}$[$_{PS}$(šəm [$_{PS}$šám)]]]				*	*	*!	
*☞ d. [$_{PW}$[$_{PS}$(šə́m [$_{PS}$šam)]]]				*	*		
e. [$_{PW}$[$_{PS}$(šəm) [$_{PS}$(šám)]]]			*!*		*	*	
f. [$_{PW}$[$_{PS}$(šə́m) [$_{PS}$(šam)]]]			*!*		*	*	
g. [$_{PW}$[$_{PS}$šəm [$_{PS}$(šám)]]]		*!	*	*	*		*
h. [$_{PW}$[$_{PS}$(šə́m) [$_{PS}$šam]]]			*!	*	*		*

In (23), candidates (a, b) are eliminated by ALIGN-RT-ST, and (g) by ALIGN-WD-FT. FTBIN-σ subsequently rules out candidates (e, f, h). Because all candidates rate equally on the WSP′, it falls to FTFORM=TROCHEE to decide between the remaining candidates (c, d), and this leads to the erroneous selection of the trochaic form in (d) instead of the actual (iambic) form in (c).

Notice that the analyses of /təctíc/ and /šəmšám/ here assume that the two syllables constituted by the reduplicant and root are contained within the bounds of a single foot. This is not an unreasonable assumption to make given that the reduplicative form contains two syllables: the preference for binary trochaic feet has already been established. However, the fact that a reduplication like /šəmšám/ does not surface with penultimate stress even when the penultimate syllable has weight indicates that the reduplicant and root do not constitute a single unit for the purposes of stress assignment. This argues against an analysis of the reduplicative form as consisting of two syllables within a single foot (as suggested by Bar-el's (2000) ROOT=SYLL). An alternative proposed by Urbanczyk (1996[2001]) for Lushootseed is to assign the reduplicant and root to feet, rather than to syllables; see (24).

(24) Prosodic category for CVC- reduplicant (following Urbanczyk 1996[2001])
ROOT=FOOT
A root equals a foot.

Given that the reduplicant is a root (19) and that the root is equal to a foot (24), the optimal configuration for a reduplicated stem is one that encloses the reduplicant and the morphological root within separate foot boundaries, and each foot must then be evaluated individually in terms of the constraints that are relevant in the evaluation of roots.

The notion ROOT=FOOT is supported in part by the observation (see the analysis of root shapes in Chapter 2, section 2.2) that the vast majority of roots in Squamish are at least potentially equal to a binary foot in that either they are disyllabic (disyllabic roots constitute 28% of free roots), thus satisfying binarity under syllabic analysis, or they are monosyllabic and closed, and therefore capable of satisfying binarity under moraic analysis (and do so if they contain a full vowel followed by a resonant; recall from Chapter 4, section 4.1, that the association of moras with obstruents and with schwa is highly constrained).

Urbanczyk (1996[2001]) characterizes the distributive reduplicant in Lushootseed in similar terms, arguing that while the prosodic categorization of the root as a foot cannot be motivated under syllabic analysis (given the canonical CVC root shape), it can be conceded under moraic analysis, as the optimal foot in Lushootseed is a binary trochee; according to Prince (1990), a trochee may consist of either two light syllables or one heavy syllable: the first is binary under syllabic analysis, the second, under moraic analysis. An analysis of CVC as bimoraic requires that in addition to the vowel, the coda consonant must also carry weight. Urbanczyk follows this track, noting for the record the lack of clearcut evidence either for or against the notion that coda consonants bear weight in Lushootseed.

In Squamish there is somewhat conflicting evidence about whether coda consonants carry weight. Under conventional syllable parsing, where onsets are optimized and codas minimized, (and disregarding for the moment the propensity for Squamish resonants to parse as codas) codas are generally found only word- or stem-finally, since word-internal coda clusters are marked. However, even though (in this conventional view) the final syllable of a word tends to be the only closed syllable, stress seldom falls on a final syllable. In short, the presence of a coda does not appear to have any bearing on stress in the word in this sense, and evidence of consonant moraicity is not to be found here.

Nevertheless, evidence presented in Chapters 3 and 4 shows that at least resonant consonants must be considered moraic, as stress is attracted to penultimate schwa-based syllables when schwa is followed by a resonant but not when the post-schwa consonant is an obstruent (for instance, in /k^{w}ə́laš/ 'shoot' vs. /səpíq/ 'yellow salmonberry'). In other words, a resonant lends weight to a schwa that precedes it, in contrast to an obstruent, which does not. It was argued in Chapter 4 that the intervocalic resonant, unlike its obstruent counterpart, is ambisyllabic, functioning as coda to the syllable that precedes it while at the same time fulfilling the onset requirement in the syllable that follows. As a coda, the resonant is able to provide weight to the schwa-based syllable, and thus permit its selection for stress.

There is evidence then that Hayes' (1989) Weight-by-Position principle holds for Squamish. But weight assigned by position is not intrinsic (unlike in the case of full vowels, which do have intrinsic weight) and, especially in OT terms, the WBYP can be interpreted as meaning that coda consonants have weight-potential: whether they actually surface with weight depends on relevant constraint rankings. Recall from Chapter 4 that in Squamish the constraint ranking *μ/K >> WBYP >> *μ/R results in this weight potential being realized for resonants, but not for obstruents. If syllable codas, where they occur in Squamish, are capable of being moraic, the CVC- reduplicant, whose vowel is always schwa, is maximally monomoraic; this follows from the analysis of Squamish schwa as nonmoraic.

Corroboration for ROOT=FOOT in Squamish comes from the analysis of stress in trisyllabic roots. As was demonstrated in Chapter 3 (section 3.1.2), the optimal candidates in the analysis of a root like /manác'i/ 'drum' are those in which the leftmost of the three syllables remains unparsed; the upshot of this analysis is that a trisyllabic root contains at most one prosodic foot. This, combined with the proposition put forward in the preceding paragraphs that a root is also minimally a foot in size, lends credence to the hypothesis that prosodically a root is equal to a foot.

If the root is equal to a foot and if foot binarity can be satisfied under moraic (μμ) as well as under syllabic (σσ) analysis (Chapters 3 and 4), we can speculate on the reason that stress prefers to fall on the morphological root rather than on the reduplicant (= root) in

/šəm+√šám/ even though both syllables contain weight[24]: while each morpheme constitutes a foot, the root's foot is wellformed (containing two moras), whereas that of the reduplicant is degenerate (since it contains only one mora). In fact, a root that contains at least a full vowel will always be favoured over the CVC- reduplicant in terms of stress because it will always contain at least one mora more than the reduplicant.

The outcome of stress in reduplicative forms, then, depends on a joint evaluation by ROOT=FOOT, which reflects the fact that the best roots contain wellformed binary feet, and FTBIN-μ, which takes into account the notion that the optimal foot is binary under moraic (and not syllabic) analysis. Thus, stress is assigned to the root that most closely conforms to an optimal foot, which contains exactly two moras.

Given ROOT=FOOT, the optimal structure for a simple reduplicated stem like /šəmšám/ is dipedal, rather than constituting a single disyllabic foot, as indicated in (25).

(25) Best foot formation for /šəmšám/
(šəm)(šam)

In terms of moraic structure, the rightmost root in (25) makes the better foot: it contains exactly two moras, whereas the foot on the left contains only one; see (26).

(26) Moraic structure for /šəmšám/
```
   μ    μμ
(šəm)(šam)
```

[24]Recall that it is not how much weight a syllable contains, but the fact of its having weight, that is important for Squamish stress.

While both roots in (26) obey ROOT=FOOT (since each is enclosed in individual foot brackets), only the one on the right adheres to FTBIN-μ. The four possible foot configurations for /šəmšam/ are evaluated in terms of these constraints in (27).

(27) FTBIN-μ, ROOT=FOOT

/RED+√šam/ 'run aground'	FTBIN -μ	ROOT =FOOT
a. μ μμ (šəm.šam)	*	*!*
→ b. μ μμ (šəm)(šam)	*	
→ c. μ μμ šəm(šam)		*
d. μ μμ (šəm)šam	*	*!

Although the evaluation in (27) rules out both candidates (a, d), which violate both of the featured constraints, it reaches no conclusion regarding (b, c): if ROOT=FOOT >> FTBIN-μ, then candidate (b) comes out on top; with the reverse ordering, candidate (c) wins. There is no indication in (27) that one of these ranked orderings is preferred over the other, as the optimal stress pattern is predicted by both.

However, the fact that disyllabic roots are perfectly acceptable in the language shows that FTBIN-σ >> FTBIN-μ: because roots are consonant-final, a foot based on a disyllabic root with two full vowels contains three moras, thereby violating FTBIN-μ; see (28).

(28) Moraic structure for /níčim/ 'speak, talk'
μ μμ
(ni.čim)

In fact, evaluating /níčim/ in terms of ROOT=FOOT and FTBIN-μ (29), proves that ROOT=FOOT must dominate FTBIN-μ; if the reverse ranking obtained, the partially parsed candidate in (29c) would be favoured over the fully parsed candidate in (29a), as the foot posited by (c) contains the requisite two moras.

(29) ROOT=FOOT >> FTBIN-μ

/ničim/ 'speak, talk'	ROOT =FOOT	FTBIN -μ
☞ a. μ μμ (ni.čim)		*
b. μ μμ (ni)(čim)	*!	*
c. μ μμ ni(čim)	*!	
d. μ μμ (ni)čim	*!	*

At the same time, FTBIN-σ must dominate ROOT=FOOT. Although the tableau in (29) does not show this, since in disyllabic roots every candidate that violates ROOT=FOOT will also violate FTBIN-σ, it is evident from the observation that control transitives formed on monosyllabic roots with full vowels (see analysis in Chapter 7, section 7.1) are optimally analysed as disyllabic feet, both in order to get the correct stress results and in order to account for root–suffix vowel harmony (for instance, in /šúk'ʷut/ (< šuk'ʷ-at) 'bathe'), which is confined to feet.

However, a ranked ordering of FTBIN-σ >> ROOT=FOOT >> FTBIN-μ again predicts erroneous stress results for /šəmšám/: if the reduplicated stem is evaluated as a foot, as in

(30a), it must surface with penultimate stress since it contains weight, therefore */šə́mšam/ rather than the attested /šəmšám/.

(30) FTBIN-σ >> ROOT=FOOT >> FTBIN-μ, FTFORM=TROCHEE

/RED+√šam/ 'run aground'	FTBIN -σ	ROOT =FOOT	FTBIN -μ	FTFORM= TROCHEE	PARSE -σ
*☞ a. μ μμ (šə́m.šam)		**	*		
b. μ μμ (šəm.šám)		**	*	*!	
c. μ μμ (šəm)(šám)	*!*		*	*	
d. μ μμ šəm(šám)	*!	*			*
e. μ μμ (šə́m)šam	*!	*	*		*

An analysis that gives weight to FTBIN-μ and/or ROOT=FOOT (for instance, as in (30c, d)), still seems the better solution, since it is able to rule out undesirable candidates like those in (30a, e), but this can only come about if the dominating influence of FTBIN-σ is neutralized. Using local conjunction to combine the individual constraints ROOT=FOOT and FTBIN-μ into a single meta-constraint RT=FT&FTBIN-μ, and having this meta-constraint dominate not only FTBIN-μ and ROOT=FOOT, but also FTBIN-σ, offers a way out of the dilemma.

The local conjunction of constraints in OT was first proposed by Smolensky (1993) to account for observations that violating two (or more) constraints that interact in some (same) domain is worse than violating one or the other of these constraints. For instance, Smolensky uses local conjunction to account for the fact that, universally, the preferred place of articulation for a coda consonant is a coronal one. Thus, two hypothetical forms *tab.da* and *tad.ba* both incur violations against each of two constraints, namely, *PL/LAB, which prohibits labial consonants, and NOCODA, which bans syllable codas. Although these constraint evaluations suggest that both forms are equally bad, in fact, *tad.ba* is preferred over *tab.da*. Smolensky explains this preference by proposing a higher ranking meta-constraint that conjoins the relevant constraints as (*PL/LAB, NOCODA, segment): although it is bad for a form to violate both *PL/LAB and NOCODA individually, as both of the hypothetical forms do, it is worse if both constraints are violated in the same domain (in this case, the segmental domain), as only *tab.da* does, since the single segment /b/ is both labial and a coda in this candidate.

The evaluation of two constraints in this manner allows for four possible outcomes; this is shown in (31).

(31) C_1 & C_2 >> C_1 >> C_2

Input	C_1&C_2	C_1	C_2
☞ Candidate (a)			
Candidate (b)			*!
Candidate (c)		*!	
Candidate (d)	*!	*	*

In (31), candidate (a) is clearly the best candidate because it obeys the constraints C_1 and C_2 individually, and therefore also passes their conjunction as C_1&C_2. However, candidates (b) and (c), which violate the individual constraints C_2 and C_1, respectively, also pass the conjoined C_1&C_2, since each violates only one of the crucial constraints; they are therefore better candidates than (d), which is eliminated summarily because it violates both C_1 and C_2 and, therefore, also the higher ranked C_1&C_2. If no candidate obeyed both individual constraints, selection of the optimal candidate would depend on the relative ranking between the two constraints; in (31), for instance, the better candidate of (b, c) is (b), since it obeys the higher ranking constraint.

In Squamish, local conjunction of the two constraints ROOT=FOOT and FTBIN-μ is ideal for capturing the generalizations made earlier that the best root is equal to a foot and that the best foot contains exactly two moras. Analysing /šəmšám/ in these terms would allow for a clear decision in favour of candidate (c) in (32) were this candidate not earlier ruled out by ALIGN-WD-FT; recall that the constraint ranking ALIGN-WD-FT >> FTBIN-σ was established in the analysis of stress in words containing non-reduplicative prefixes in section 5.1. As a result, the optimal candidate is (b), which encloses both the reduplicant's degenerate foot and the root's wellformed foot in individual foot brackets.

(32) /šəmšám/ 'run aground'

/RED + √šam/ 'run aground'	RT=FT& FTBIN-μ	ALIGN-WD-FT	FTBIN -σ	ROOT =FOOT	FTBIN -μ	FTFORM= TROCHEE	PARSE -σ
a. μ μμ (šəm.šám)	*!			**	*	*	
☞ b. μ μμ (šəm)(šám)			**		*	*	
c. μ μμ šəm (šám)		*!	*	*			*
d. μ μμ (šə́m) šam	*!		*	*	*	*	*

In (32), candidates (a, d), which are in violation of both FTBIN-μ and ROOT=FOOT, are eliminated by the higher-ranked conjunction of these constraints. Candidate (c) is ruled out by ALIGN-WD-FT, and (b) wins in spite of the two violations it incurs against FTBIN-σ.[25]

The tableau in (34), which evaluates the trisyllabic /ʔəmʔímač/ 'grandchildren' shows, however, that the analysis is not complete. Not only is the configuration in (34f, g) unlikely, in light of the importance of wellformed root-feet in Squamish stress assignment, but it results in an erroneous stress result for words in which the final consonant of the reduplicant is a resonant, selecting the trochee in (g) rather than the iamb in (f). The desired result can be achieved by proposing that a foot be aligned with the right edge of the prosodic word (as ALIGN-WD-FT aligns the left edges of word and foot); the appropriate constraint is that in (33).

(33) ALIGNR-WD-FT
Align (PWord, R, Foot, R)
The right edge of every prosodic word coincides with the right edge of some foot.

In fact, it seems likely, given that ROOT=FOOT already sees to foot alignment at both edges of the root, that the constraint invoked in Chapter 3 as ALIGN-RT-FT is not needed and can be replaced by ALIGNR-WD-FT. The tableau in (34) shows that ALIGNR-WD-FT must dominate FTBIN-μ; however, this is not a problem in terms of replacing the earlier constraint with that in (33): recall that the analysis of root stress in Chapter 3 did not establish a crucial ranking for ALIGN-RT-FT. (To clarify matters, the constraint aligning

[25]Shaw (p.c.) points out that headless feet are in violation of a generally accepted notion of properheadedness (in which, for instance, a foot is deemed to be properly headed if it contains a stressed syllable).

word and foot at their left edges, invoked in section 5.1 as ALIGN-WD-FT, will henceforth be referred to as ALIGNL-WD-FT.)

(34) /ʔəmʔímač/ 'grandchildren'

μ μ /RED + √ʔimač/	RT=FT& FTBIN-μ	ALIGNL -WD-FT	ALIGNR -WD-FT	FTBIN -σ	FTBIN -μ	FTFORM= TROCHEE	PARSE -σ
a. μ μ μ ʔəm(ʔí.mač)		*!					*
☞ b. μ μ μ (ʔəm)(ʔí.mač)				*	*	*	
c. μ μ μ (ʔəm)(ʔi.máč)				*	*	**!	
d. μ μ μ (ʔə́m)(ʔi.mač)				*	*	**!	
e. μ μ μ (ʔəm.ʔí)(mač)	*!			*	*	**	
f. μ μ μ (ʔəm.ʔí)mač			*!			*	*
g. μ μ μ (ʔə́m.ʔi)mač			*!				*

In (34), candidate (e) is eliminated by RT=FT&FTBIN-μ, while (a, f, g) are ruled out for failing to align feet with the left (a) and right (f, g) edges of the word. The remaining candidates all violate FTBIN-σ and FTBIN-μ, and candidate (b) eventually wins on the basis of FTFORM=TROCHEE.

The analysis of stress in CVC- reduplicated stems thus far has focussed on forms in which the root contains at least one full vowel; in every case, the best candidate has been one that posits separate foot structures for the reduplicant and root, largely due to the meta-constraint RT=FT&FTBIN-μ, but with some help from ALIGNR-WD-FT (33). These forms have always surfaced with stress on the full-vowel root. In contrast, a reduplicated stem formed on a root with schwa, such as /x̣ə́cx̣əc/, surfaces with stress on the reduplicant; these forms are analysed in the tableaux that follow.

The analysis in (35) shows that the best configuration for a reduplicated stem based on a monosyllabic root with schwa is, again one that encloses reduplicant and root within individual feet.

(35) /qʷə́lqʷəl/ 'talk excessively'

/RED + qʷl/	RT=FT& FTBIN-μ	ALIGNL -WD-FT	ALIGNR- WD-FT	FTBIN -σ	WSP′	FTFORM= TROCHEE	PARSE -σ
a. μ μ (qʷəl qʷə́l)					*	*!	
☞ b. μ μ (qʷə́l qʷəl)					*		
c. μ μ (qʷə́l)(qʷəl)				*!*	*	*	
d. μ μ (qʷəl)(qʷə́l)				*!*	*	*	
e. μ μ qʷəl (qʷə́l)	*!	*		*!	*		*
f. μ μ (qʷə́l) qʷəl	*!		*	*!	*		*

In (35), the configurations in (e, f) are ruled out by RT=FTBIN&FTBIN-μ: each of these candidates foots only one of the two Roots, and each foot contains but a single mora. In contrast, candidates (a, b) and (c, d) each default on only one of the individual constraints in the meta-constraint: (a, b) each contain two moras but fail to provide separate feet for the morpheme constituents, while the reverse is true for (c, d). The candidates in (a, b), both of which posit a single disyllabic foot on the reduplicative form, are considered the better of these candidate pairs, since they obey FTBIN-σ, in contrast to candidates (c, d) which each incur two violations against this constraint. Of (a, b), the winner is (b), since it alone adheres to FTFORM=TROCHEE.

In contrast, when the schwa-based reduplicated stem contains neither full vowels nor resonant codas (as is the case for /x̣ə́čx̣əč/ 'remember'), the preferred configuration is again that found for reduplications formed on roots with full vowels. Because obstruent codas do not surface with weight (see Chapter 4), the best candidate for /x̣ə́čx̣əč/ will posit a monosyllabic foot on the reduplicant and another one on the root: a disyllabic configuration such as that advocated for /qʷə́lqʷəl/ will fail on FTBIN-μ as well as on ROOT=FOOT (recall that /qʷə́lqʷəl/ failed only on the latter), and therefore will not pass RT=FT&FTBIN-μ. This is shown in (36). LEFTMOST stipulates that the head foot of the word will be situated at the left edge of the prosodic word.

(36) /x̣ə́čx̣əč/ 'remember'

/RED +x̣č/		RT=FT& FTBIN-μ	ALIGNL -WD-FT	ALIGNR-WD-FT	FTBIN -σ	FTFORM= TROCHEE	LEFT MOST	PARSE -σ
	a. (x̣əč x̣ə́č)	*!				*		
	b. (x̣ə́č x̣əč)	*!						
☞	c. (x̣ə́č)(x̣əč)				**	*		
	d. (x̣əč)(x̣ə́č)				**	*	*!	
	e. x̣əč (x̣ə́č)	*!	*		*		*	*
	f. (x̣ə́č) x̣əč	*!		*	*		*	*

In (36), the only candidates to pass Rt=Ft&FtBin-μ are (c, d). Each of these candidates incurs two violations against FTBIN-σ and one against FTFORM=TROCHEE, and LEFTMOST eventually decides in favour of candidate (c), which stresses the leftmost of the two feet. While the tableau in (36) does not show that FTFORM=TROCHEE >> LEFTMOST is crucial, this order is indicated for /ʔəmʔímač/, analysed in (34), since any other ranking would result in an optimal candidate of (34d) */(ʔə́m)(ʔimač)/, which stresses the reduplicant instead of the root.

In summary, the stress differences observed between CVC- reduplications formed on roots with full vowels, which surface with root stress, and those with schwa, which feature stress on the reduplicant, result from a weight differential that exists between the root and the reduplicant in these forms. Because the reduplicant contains only schwa, it surfaces with, at most, a single unit of weight (and this only if the consonant in coda position is a resonant, as in /šəmšám/). The root, on the other hand, always contains at least one additional unit of weight (as weight is inherent for full vowels), with the result that the root will always be favoured for stress. For reduplicated stems with full vowels, then, the resolution of stress is based on a comparison of weight content in the individual morphemes, and therefore, the best configuration is one that foots the root and the reduplicant individually.

In contrast, when the base for reduplication is a schwa-based root, there is no such basis for comparison between root and reduplicant, as both morphemes are equal in moraic content. It falls, then, to either LEFTMOST (in the case of /x̣ə́čx̣əč/, which surfaces with no moraic content) or FTFORM=TROCHEE (in the case of /q^{w}ə́lq^{w}əl/, which surfaces with two moras in total) to resolve stress in these words. For forms like /q^{w}ə́lq^{w}əl/, which contain coda resonants, the optimal configuration turns out to be one that encloses both reduplicant and root in a single disyllabic foot.

I now proceed to the analysis of stress in CV- reduplicative forms.

5.2.2. CV- reduplication

Examples of Squamish words resulting from CV- reduplication are given in (37-38), which list productive reduplicative forms, in which the vowel in the reduplicant is a copy of that in the root, in (37), and nonproductive /Ci-/ forms in (38). In (37), reduplications formed on monosyllabic full-vowel roots, schwa-based roots, and disyllabic roots are listed in (37a, b, c), respectively.

(37) CV- reduplication

a. Monosyllabic root has full vowel

p’á+√p’ač’	‘hot, feverish’	t’á+√t’aɬ	‘loom’
c’í+√c’iq	‘to leak’	t’ú+√t’uk’^{w}	‘be going home’

b. Monosyllabic root has schwa

ʔəs-t’ə́+√t’k’^{w}	‘dugout, pit’ (√t’ək’^{w})
s-mə́+√mnʔ	‘(be) with child’ (√mənʔ)
lí+lʔs	‘be below’ (ləs)
sə́+√slq^{w}	‘be sad, lonesome’ (√səlq^{w})

c. Disyllabic roots

t’á+√t’ayʔaq’	‘be angry’ (√t’áyaq’)
ʔí+√ʔimʔaš	‘take a walk, be walking’ (√ʔímaš)
ʔú+√ʔumʔat	‘be too lazy (to do something)’ (√ʔúmat)

(38) Cí- (diminutive) reduplication[26]

a. Root has full vowel(s)

líʔ[27]+√lamʔ 'little house'

k'ʷí+√k'ʷixʷaʔ 'little box' (√k'ʷáxʷaʔ)

b. Root has schwa

kʷí+√kʷɬ 'small canoe' (√kʷə́ɬ)

s-q'í+√q'iml 'little paddle' (s√q'ʷə́ml)

The reduplicated stems listed in (37a-c, 38) show that the CV- reduplicant bears word stress regardless of vowel quality in the root.[28] The few examples Kuipers (1967) lists of the nonproductive diminutive reduplication (38) show that the diminutive reduplicant tends to take the form /Ci-/ and the leftmost vowel in the root is an echo of the vowel in the reduplicant.

As previously mentioned, CV- reduplication differs from CVC- reduplication not only in the size of the reduplicant, but also in the quality of its vowel, which for CV-

[26]Bar-el (2000) indicates that diminutive reduplication is not productive in Squamish today, and judging from the paucity of these forms in Kuipers (1967), this was likely already the case some forty years ago.

[27]In diminutive reduplication a glottal stop is inserted between reduplicant and root when the first consonant of the root is a resonant.

[28]The forms /t'ə+√t'íʔqi/ 'soak dried salmon in water' and /xʷə+√xʷičús/ 'move sideways' are atypical, as one would expect /CÁ/ rather than /Cə/ reduplication in these cases, resulting in the illformed */t'í+√t'iʔqi/ and */xʷí+√xʷičus/. The actual reduplicative forms suggest that [i] in the first syllable of the roots involves stems from underlying /əy/, resulting in /t'ə+√t'əyʔqi/ and /xʷə+√xʷəyčus/, with subsequent transformation of /əy/ to [i]. However, even if this could be proven to be the case, stress would still be expected to fall on the reduplicant rather than on the root. As these words were the only exceptional forms of this type in the corpus, they will be treated here as anomalous.

reduplicants is almost invariably an exact copy of the vowel in the base. CV- reduplicants also differ from CVC- reduplicants in that they usually bear stress.

As already noted, the CV- reduplicant has the shape of a typical unmarked syllable, not only for Squamish, but across many languages. As described in an earlier section, Urbanczyk (1996[2001]) uses reduplicant shape as an argument in her classification of the Lushootseed CVC- (distributive) and CV- (diminutive) reduplicants as a ROOT and an AFFIX, respectively. In particular, she notes that CV- prefixal reduplicants have the same shape as do non-reduplicative prefixes in the language. The same argument cannot be applied in the analysis of the CV- reduplicant in Squamish, where this shape is only found in one non-reduplicative prefix; the majority of these prefixes have a CVC- shape, and thus bear a greater resemblance to roots than to affixes. Nevertheless, I ascribe the category of Affix to the CV- reduplicant: although its shape differentiates it from the majority of prefixes in the language, it does not resemble roots either in shape or in stress behaviour. Importantly, the competition for stress between root and reduplicant in CVC- reduplication is notably absent in CV- reduplication. The morphological category for the CV- reduplicant is therefore held to be that in (39).

(39)

Morpheme	Shape
RED_2	MCat=Affix

To reflect the fact that the CV- reduplicant is exactly the size of the quintessential syllable, the prosodic category of this reduplicant is defined as in (40).

(40) Prosodic category for CV- reduplicant
AFFIX=SYLL
An affix is a syllable.

Since the CV- reduplicant is taken to be a prefix, it has a different configuration, in terms of prosodic domains, from that of the CVC- reduplicant, which, recall, occupied its own stem. Unlike the CVC- reduplicant, the CV- reduplicant occupies the same stem as that occupied by the morphological root: this is evident from the way stress configures in the reduplicated stem as a unit, since stress on the reduplicant forces stress shift in the base. If the CV- reduplicant is resident in the same prosodic stem as the root and if, as argued in section 5.2.1, the root is leftmost in the prosodic stem, it seems apt to propose that the CV- reduplicant is in fact part of the prosodic root, as Czaykowska-Higgins (1996, 1998) posits for reduplicative suffixes in Moses-Columbian. The proposed analysis of CV- reduplicative stems in terms of prosodic domains, then, is that indicated in (41).

(41) Prosodic domains for CV- reduplication in Squamish
$[_{PS}\ [_{PR}$ RED √ROOT$]_{PR}\ ]_{PS}$

To align the reduplicant in the PRoot, I propose the constraint, in (42), which is based on McCarthy and Prince's (1993b) constraints on generalized alignment.

(42) ALIGN-$[\text{RED}]_{AF}$
Align ($[\text{RED}]_{Af}$, Left, PRoot, Left)
The left edge of every CV- reduplicant coincides with the left edge of some PRoot.

The relative ranking of the constraint in (42) with respect to other constraints in the language is not known; however, it is assumed in the analyses that follow to be at the high end, with other constraints on alignment, rather than at the low end.

Stress in CV- reduplicative forms can now be analysed as demonstrated in the following series of tableaux, beginning in (43) with the analysis of a CV- reduplicated stem based on a monosyllabic (morphological) root containing a full vowel.

(43) /p’áp’ač/ ‘feverish’

/RED + √p’ač/ [$_{PS}$ [$_{PR}$ RED √p’ač]]	ALIGN-[RED]$_{AF}$	RT=FT&FTBIN-μ	ALIGNL-WD-FT	ALIGNR-WD-FT	FTBIN-σ	FTFORM=TROCHEE	PARSE-σ
a. μ μ [(p’á.[p’ač)]]	*!						
☞ b. μ μ [[(p’á.p’ač)]]							
c. μ μ [[(p’a.p’áč)]]						*!	
d. μ μ [[(p’á)(p’ač)]]		*!			**	*	
e. μ μ [[(p’a)(p’áč)]]		*!			**	*	
f. μ μ [[p’a (p’áč)]]		*!	*		*		*
g. μ μ [[(p’á) p’ač]]		*!		*	*		*

In (43), candidate (a) is eliminated by ALIGN-[RED]$_{AF}$, since it aligns the reduplicant with the left edge of the prosodic stem rather than with that of the PRoot, while candidates (d-g) are ruled out by RT=FT&FTBIN-μ. The winner, then, is the candidate in (43b), which posits a disyllabic trochee posited on the entire reduplicative form.

The analysis of the trisyllabic reduplicative form /t’át’ayaq’/ ‘be angry’ in (44) shows that both RT=FT&FTBIN-μ and ALIGNL-WD-FT must dominate ALIGNR-WD-FT, a ranking that was not forthcoming from earlier analyses. In contrast to the four candidates in (44a-d), those in (e, f) adhere to RT=FT&FTBIN-μ: while none of the candidates obey ROOT=FOOT, candidates (e, f) obey FtBin-μ, since each posits a single wellformed bimoraic foot. Of these, the left-oriented foot in (e) is preferred over the right-oriented one in (f). It is assumed that all candidates listed in the tableau are in adherence with ALIGN-[RED]$_{AF}$.

(44) /t'át'ayaq'/ 'be angry'

/RED + t'ayaq'/ [PS [PR RED √t'ayaq']]	RT=FT& FTBIN-μ	ALIGNL -WD-FT	ALIGNR -WD-FT	FTBIN -σ	FTFORM= TROCHEE	PARSE -σ
a. μ μ μ (t'á)(t'a.yaq')	*!			*	*	
b. μ μ μ (t'á.t'a)(yaq')	*!			*	*	
c. μ μ μ (t'a)(t'á.yaq')	*!			*	*	
d. μ μ μ (t'a t'á)(yaq')	*!			*	**	
☞ e. μ μ μ (t'á.t'a) yaq'			*			*
f. μ μ μ t'a (t'á.yaq')		*!		*		*

The CV- reduplicative forms analysed thus far have all contained one or more full vowels. The analysis of forms with only schwa calls for a somewhat different approach, as shown by (45).

(45) /qə́qəč ~ qə́qč/ 'increase (about the moon)'

/RED + qč/ [PS [PR RED √qč]]	RT=FT& FTBIN-μ	ALIGNL -WD-FT	ALIGNR -WD-FT	FTBIN -σ	FTFORM= TROCHEE	PARSE -σ
☞ a. (qə́ qəč)						
b. (qə qə́č)					*!	
c. (qə́)(qəč)	*!			**	*	
d. (qə)(qə́č)	*!			**	*	
e. qə (qə́č)	*!	*		*		*
f. (qə́) qəč	*!		*	*		*

In (45), RT=FT&FTBIN-μ roots out candidates (c-f); although they have no surface weight, candidates (a, b) adhere to ROOT=FOOT and, on this basis, slip past the meta-constraint. Of the two, candidate (a) is preferred because it adheres to FTFORM=TROCHEE.

The analysis in (46), which involves the CV- reduplication of a resonant-final schwa-based root, shows that the CV- reduplicant must contain underlying weight; although this was not a requirement in the analyses of other CV- reduplicative forms in this section, stress on the reduplicant in /sə́səlqʷ/ cannot be accounted for in any other way.[29] The tableau in (46) shows the erroneous results when the reduplicant does not have weight: instead of stressing the reduplicant, the WSP′ rules that stress will surface on the morphological root, which constitutes the only syllable with weight.

(46) /sə́səlqʷ/ 'be sad, lonesome'

/RED + slqʷ/ [PS [PR RED √slqʷ]]	RT=FT& FTBIN-μ	ALIGNL -WD-FT	ALIGNR -WD-FT	FTBIN -σ	WSP′	FTFORM= TROCHEE	PARSE -σ
→ a. μ (sə́.səlqʷ)					*!		
*☞ b. μ (sə.sə́lqʷ)						*	
c. μ (sə́)(səlqʷ)	*!			**	*	*	
d. μ (sə)(sə́lqʷ)	*!			**		*	
e. μ sə (sə́lqʷ)	*!	*		*			*
f. μ (sə́) səlqʷ	*!		*	*	*		*

[29]An analysis of the reduplicant as inherently accented would result in a misanalysis of stress in some words, for instance, in /c'əc'əqʷáls/ 'small black flies', analysed in (48); based on the analysis of suffixed forms involving accented suffixes (see Chapter 6), the accented reduplicant would be expected to win out over an accentually unmarked root, but it does not.

The tableau in (47) shows the difference when the reduplicant is given an underlying mora. Note that weight in the reduplicant cannot be a surface phenomenon because the reduplicant contains neither full vowel nor coda, and schwa is weightless.

(47) /sə́səlq^{w}/ 'be sad, lonesome'

μ /RED + slq^{w}/ $[_{PS}$ $[_{PR}$ RED √slq^{w}]]	RT=FT& FTBIN-μ	ALIGNL -WD-FT	ALIGNR -WD-FT	FTBIN -σ	WSP′	FTFORM= TROCHEE	PARSE -σ
☞ a. μ μ (sə́.səlq^{w})					*		
b. μ μ (sə.sə́lq^{w})					*	*!	
c. μ μ (sə́)(səlq^{w})	*!			**	*	*	
d. μ μ (sə)(sə́lq^{w})	*!			**		*	
e. μ μ sə (sə́lq^{w})	*!	*		*			*
f. μ μ (sə́) səlq^{w}	*!		*	*	*		*

Unlike in (46), both of the top candidates in (47) violate the WSP′: since both syllables have weight, there is always one syllable with weight that is not assigned stress. The outcome then depends on FTFORM=TROCHEE, with the result that the disyllabic trochee in (a) is permitted to win.

Up until now, all CV- reduplications examined have surfaced with stress on the reduplicant. While this represents the usual stress outcome for these forms, there are instances in the data where a reduplicant with schwa loses stress to a full vowel two syllables to its right; a case in point is /c'əc'əq^{w}áls/ 'small black flies', analysed in (48).

Although the ranking RT=FT&FTBIN-μ >> ALIGNL-WD-FT had not been established prior to this point, the analysis in (48) suggests that such a ranking is warranted.

(48) /c’əc’əqʷáls/ ‘small black flies’

μ μ /RED + c’qʷals/ [$_{PS}$ [$_{PR}$ RED √c’qʷals]]	RT=FT& FTBIN-μ	ALIGNL -WD-FT	ALIGNR -WD-FT	FTBIN -σ	WSP′	FTFORM= TROCHEE	PARSE -σ
a. μ μμ (c’ə́)(c’ə.qʷals)	*!			*	*	*	
b. μ μμ (c’ə́.c’ə)(qʷals)	*!			*	*	*	
c. μ μμ (c’ə)(c’ə.qʷáls)	*!			*	*	**	
d. μ μμ (c’ə.c’ə)(qʷáls)	*!			*	*	*	
e. μ μμ (c’ə́)(c’ə.qʷals)	*!			*	*	*	
f. μ μμ (c’ə)(c’ə́.qʷals)	*!			*	**	*	
g. μ μμ (c’ə́.c’ə) qʷals	*!		*				*
h. μ μμ c’ə.c’ə (qʷáls)		*		*!	*		**
☞ i. μ μμ c’ə (c’ə.qʷáls)		*				*	*

In (48), candidates (a-g) all default on RT=FT&FTBIN-μ, while (h-i) fail on ALIGNL-WD-FT; of the latter, (i) is the better candidate because it obeys FTBIN-σ. If, instead of RT=FT&FTBIN-μ >> ALIGNL-WD-FT, the reverse ranking obtained, it would be a choice between candidates (b, d), with a final decision to be made by some constraint that indicates a preference to stress full vowels rather than schwa[30]; however, such a constraint is not required to account for stress elsewhere in the grammar. The existence of other CV-reduplicative forms that are similar in shape to /c’əc’əqʷáls/, but which differ in stress orientation in that stress falls on schwa in the reduplicant (for instance, /šə́šəwʔay/ ‘grow all over’) suggests that both configurations are possible, even though forms that stress the full vowel are more prevalent in the data. Given these factors, and especially given that a constraint against stressing schwa is not required elsewhere in the grammar, the best analysis for /c’əc’əqʷáls/ appears to be that represented by candidate (i); therefore, RT=FT&FTBIN-μ >> ALIGNL-WD-FT, a ranking that is, in fact, later corroborated by the analysis of stress in /-at/ transitive forms (Chapter 7).

The analysis in this section has shown that stress in CV- reduplicative forms can be straightforwardly explained by assuming that the reduplicant is an affix that not only prefixes to the morphological root, but joins it in the PRoot. For CV- reduplications involving schwa-based roots, the correct stress outcome depends in part on an analysis of the reduplicant as having intrinsic weight.

5.3. Chapter summary

The purpose of this chapter has been to examine and analyse the effects of prefixation on stress in Squamish words. The discussion in these sections shows that different stress patterns prevail between reduplicative and non-reduplicative prefixes, in that only the former can bear stress, and between CVC- and CV- reduplicative prefixes, in that while the

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[30]Notice that this does not subsume the WSP′.

former carry stress only in combinations with schwa-based roots, the latter virtually always bear stress (in a few exceptions, stress falls on a full vowel in the root instead of on schwa in the reduplicant).

Because non-reduplicative prefixes are outside the realm of stress, they are analysed here as being outside the prosodic word. Reduplicative prefixes, on the other hand are contained within the prosodic word. In part because of the different ways in which stress surfaces in words involving CVC- and CV- reduplication, and in part because of their unique shapes, the two reduplicant types are analysed differently. CVC- reduplicants, which have exactly the shape of the canonical Squamish root, are analysed as roots, and for this reason also as feet. As roots, CVC- reduplicants are analysed by the same means as are morphological roots; therefore, the two parts of a CVC- reduplicated stem are individually held answerable to these contraints. As each root morpheme optimally contains a foot, stress in the reduplicated stem is decided on the basis of foot wellformedness: essentially, it is a competition between the two root-feet, with stress going to the bestformed foot (moraic and syllabic trochees, in that order, make the best feet). Because the vowel in the CVC- reduplicant is always schwa, any root containing a full vowel will constitute a better foot than the corresponding reduplicant; as a result, the morphological root always gets assigned stress in these cases. In contrast, when the morphological root also contains schwa, neither root is better formed than the other, and LEFTMOST grants the reduplicant stress.

In contrast, CV- reduplicants, which have the shape of the canonical syllable in Squamish, as well as that of a common prefix type universally (although not in Squamish), are analysed as affixes and syllables. In part because the root occupies the leftmost position of a prosodic stem, the CV- reduplicant, which prefixes the root, is analysed as part of the PRoot itself. In CV- reduplication, then, it is the reduplicative stem as a unit that must answer to constraints on roots; the reduplicant never does so on its own (unlike the CVC- reduplicant). Again unlike its CVC- counterpart, the CV- reduplicant is argued to contain an underlying mora; such an assumption is necessary in order to account for stress in reduplications of schwa-based roots. In combination, these factors permits stress to surface on the reduplicant, not only when it contains a full vowel, but also when it contains schwa, the latter especially when there is no full vowel elsewhere in the word.

Clearly, prosodic domains play an important role in the analysis of stress in words resulting from the application of both reduplicative and non-reduplicative prefixation processes. The prosodic domains configuration indicated by the analyses in this chapter is provided here in (49).

(49) Prosodic domains configuration for prefixed forms

$[_{PP}$ PRE- $[_{PW}$ $[_{PS}$ $[_{PR}$ RED$]_{PR}$ $[_{PS}$ $[_{PR}$ RED √ROOT$]_{PR}$ $]_{PS}$ $]_{PS}$ $]_{PW}$ $]_{PP}$

An important part of the analysis of stress in reduplicated stems, particularly those involving CVC- reduplication, is the recognition of a connection between what constitutes the most common root shape, namely, a CVC shape, and what constitutes a wellformed foot, namely, a binary trochee. A best root shape of CVC, allows for exactly three possible variations, and these can be ranked in terms of wellformedness, with CAR being considered the bestformed root, since it contains exactly two moras. Neither CAK nor CəR are optimal, as each contains a single mora; however, they are preferable to CəK roots, which contain no weight at all. When two root-feet (for instance, the two roots in a CVC- reduplicated stem, each of which forms a foot), compete for word stress, the winner will be the one that most closely resembles the ideal binary trochee. The conjunction of two constraints, one of which states that a root is equal to a foot, and the other, that the best foot contains exactly two moras, thus allows for a satisfactory solution to the problem of stress in these complex words.

These factors of necessity play a lesser role in the analysis of stress in CV-reduplicated stems: since the CV- reduplicant is only part of a PRoot domain (the same one occupied by the morphological root), it is evaluated in conjunction with the morphological root, but never on its own merits.

The analysis of stress in prefixed forms in this chapter has hinged on the constraints and rankings in (50).

(50)

```
           RT=FT&FTBIN-μ
                 |
           ALIGNL-WD-FT
                 |
           ALIGNR-WD-FT
                 |
             FTBIN-σ
                 |
               WSP′
                 |
            ROOT=FOOT
                 |
             FTBIN-μ
                 |
         FTFORM=TROCHEE
            /          \
      LEFTMOST        PARSE-σ
```

Chapter 6

Stress in polymorphemic words involving lexical suffixation

6.0. Introduction

Following the analysis of stress in prefixed forms in Chapter 5, Chapters 6 and 7 continue the investigation of the role of the morphology in Squamish stress assignment by examining and analysing stress patterns in polymorphemic words containing one or more suffixes; the role of lexical suffixation is examined in Chapter 6, that of grammatical suffixation in Chapter 7. In some features the behaviour of stress in words containing lexical suffixes and those containing grammatical suffixes is similar, and to this extent the introductory section of the current chapter serves as an introduction to suffixation as a whole in Squamish.

The data listed in (1-2) give an indication of how stress in Squamish patterns in morphological concatenations consisting of a root plus a single suffix. These data sets reflect at the most basic level the two main patterns of stress observed in minimally suffixed forms with a single prominence; thus, in the examples listed in (1), stress surfaces on the root, while in those listed in (2), stress is on the suffix. The data lists provide examples with grammatical suffixes as well as those with lexical suffixes; the former are separated from the root by means of “-”, the latter by “=”.

(1) Root stress

a.	√p’íč=ač	‘get hand caught’	√qíx̣=us	‘blind’
	√námʔ-šit	‘take (s.t.) to someone’	√cə́xʷ-nəxʷ	‘hit accidentally’
b.	n-√c’áq=iʔəqʷ	‘bald’	√x̣ʷíƛ’=wiɬ	‘be half full’
	√cə́xʷ=iʔəqʷ	‘get hit on the head’	√qə́q=wiɬ	‘brand-new canoe’

(2) Suffix stress

a.	√x̣əwƛ’=áč	‘break one’s arm’	√c’əh=ús	‘get hit in the face’
	√cəxʷ-šít	‘toss (s.t.) at someone’		
b.	√caqʷ=áyaʔn	‘have one’s ear bleeding’	√puš=úlɬ	‘kitten’
	s-√qʷəh=áyaʔn	‘hole through the ear’		

The first thing to observe about stress orientation in (1-2) is that stress has a strong tendency to fall on the root rather than on the suffix when the root contains a full vowel, as exemplified by the first three forms in (1a), but on the suffix when the root has schwa and the suffix contains a full vowel, as seen in (2a); the fourth example in (1a), namely, /cə́xʷ-nəxʷ/, shows that when both root and suffix are schwa-based, stress falls on the root. Clearly, just as for bare roots, vowel quality plays an important role in the assignment of stress in suffixed forms. The words in (1b, 2b) show, however, that in some instances this general tendency is disregarded, with stress falling on the suffix even when the root contains a full vowel, as shown by /√puš=úlɬ/ in (2b), or on the schwa-based root even when the suffix contains a full vowel, as demonstrated by /√qə́q=wiɬ/ in (1b). Thus, three main patterns of stress are clearly observable in the examples in (1-2); these patterns are listed in (3).

(3) Stress patterns in Root–Suffix combinations in Squamish
   i. Stress is variable, falling on a full vowel in the root if available, otherwise on a full vowel in the suffix
   ii. Stress falls on the root regardless of vowel quality
   iii. Stress falls on the suffix regardless of vowel quality in the root

The stress pattern listed in (3.i), namely, that stress in suffixed forms is driven by vowel quality in the root, accounts for stress in a sizeable portion of the data in Squamish; this is plainly the default pattern.[1] However, the fact that other patterns exist in which stress falls consistently on the root or on the suffix regardless of vowel quality raises a question as to what is responsible for stress in these exceptional cases. The stance taken here is that in general when stress falls without exception on a given morpheme in a concatenation (for instance, on the suffix /=áyaʔn/ 'ear'), this indicates that the morpheme in question is lexically accented; furthermore, when stress consistently fails to surface on a given morpheme (such as the suffixes /ayʔəq^{w}/ 'top, top of head' and /=wiɬ/ 'belly, container, canoe'), this indicates that the morpheme is inherently unaccented (or unaccentable). In contrast to (3.ii-iii), where the locus of stress is fixed by the presence of underlying accent on one or both morphemes, the variability of stress in the default case, namely, that given in (3.i), falls out entirely from phonological factors, neither morpheme being accentually marked.

To preview the major findings of this chapter, it will be demonstrated, first of all, that in the majority of suffixed forms resulting from lexical suffixation, stress in Squamish is

[1]It may be that the pattern described in (3.i) ought to be revised to state that stress falls on a root with weight (rather than one with a full vowel), given that resonants like to be parsed as codas; however, the "weight" rather than "a full vowel" here is problematic in that while there is consistent evidence for the latter position, evidence for the former is less reliable.

predictable on the basis of the quality of the vowel in the root and, secondly, that stress in many of the words that do not conform to this main pattern can be explained in terms of lexical accent. A third factor, namely, one that considers the semantic relationships between the morphemes involved, is brought in to account for a number of holdouts. Although, individually or in partnership, these three factors allow for a straightforward and cohesive account of the stress patterns seen in much of the data resulting from lexical suffixation, an adequate account of suffixation as a whole (that is, grammatical as well as lexical) requires reference to prosodic domains in addition to these factors.

To some extent, the analysis here follows Revithiadou's (1999) account of the stress systems of four other Salishan languages, in which she focusses mainly on the interactive roles played by morphosyntactic headedness and lexical accent in stress assignment. However, it should be noted that in contrast to the major role assigned to it in Revithiadou's (1999) analysis of stress in other Salishan languages, lexical accent plays a relatively minor role in Squamish stress, simply because only a small minority (fewer than five percent) of morphemes in the language are demonstrably marked for accent. Moreover, while Revithiadou's theory of head-driven stress is able aptly to describe the behaviour of stress in many suffixed forms containing lexical suffixes (which are argued here, as in Revithiadou, to subsist at two levels of representation), its applicability to the realm of grammatical suffixation is almost negligible. Indeed, for the vast majority of suffixed forms, including those resulting from lexical as well as grammatical suffixation, a more elegant and economical explanation of stress can be attained by considering a combination of phonological factors, morphological factors, and prosodic domains.

The vast majority of Squamish suffixes, like roots, are not accentually marked; for the most part, accentually unmarked suffixes surface with primary stress only when they are attached to schwa-based roots, especially when the root-final consonant is an obstruent (see discussion in Chapter 4, section 4.2). However, a small number of affixes are marked in the lexicon as being either inherently accented or inherently unaccented (that is, unaccentable). Accented morphemes (for instance, the lexical suffix /=áyaʔn/ 'ear') invariably surface with primary stress, even when they are affixed to a strong root, while unaccented affixes (for instance, the lexical suffix /=ayʔəq^{w}/ 'top of head'), never receive primary stress, even when affixed to a schwa-based root. As already mentioned, an affix is taken as accented/unaccented if it always/never surfaces with stress (for instance, in /caq^{w}=áyaʔn/ 'have one's ear bleeding', /sq^{w}əh=áyaʔn/ 'hole through the ear', where the suffix is accented, and in /cə́x^{w}=iʔəq^{w}/ 'get hit on the head', /nc'áq=iʔəq^{w}/ 'bald', where the suffix is unaccented). Given that roots in polymorphemic concatenations are favoured for stress in the absence of accentual marking, the primary way of detecting whether a root has accent is in observing whether in its bare form it adheres to the patterns of basic stress discovered in Chapter 3. Thus, because stress in roots favours penultimate syllables with weight (which can be in the form of a full vowel or a resonant consonant), stress falls predictably on the penultimate syllable in /míx̣aɬ/ 'black bear' and /qə́nax^{w}/ 'throat' and on the final syllable in /ʔəq^{w}ís/ 'thin', but is unpredictable in /staqíw/ 'horse', which fails to stress the penultimate syllable even though it contains weight. A root like /staqíw/, therefore, is considered to be accented lexically.

The multifaceted stress system observed in Squamish words involving suffixation argues for a prosodic representation of the Squamish word that consists of four levels or domains: the phonological root (PRoot), which holds the morphological root or one of several other morphemes that are categorized as a root (for instance, a reduplicant; see section 5.2.1 of Chapter 5); the phonological stem (PStem), which, in addition to the PRoot, includes the incorporating-type lexical suffixes and/or one of a few grammatical suffixes (for instance, the inchoative-marking *-iʔ*); the phonological word (PWord), which consists of one or more PStems (non-referential lexical suffixes reside in the second of two PStems, in contrast to referential lexical suffixes, which are part of the same PStem as that occupied by the morphological root); and the phonological phrase (PPhrase), which consists of the PWord and any of the majority of grammatical suffixes (the most prolific of these being the *-an* control transitive). Importantly, the variable ways in which stress is impacted by the addition of lexical suffixes alone[2] demand that PStem and PWord be posited as separate domains, while the effects of adding grammatical suffixes, which, although stressable, have a limited, highly constrained impact on word stress as such, argues for the inclusion of the PPhrase, which dominates PWord. The proposed prosodic domains analysis for suffixation is stated in (4).

(4) Phonological domain for suffixation in Squamish

$[_{PP}\ [_{PW}\ [_{PS}\ [_{PR}\ \sqrt{\text{Root}}]_{PR}\ =\text{LS}_{inc}]_{PS}\ [_{PS}\ [_{PR}\ =\text{LS}_{cmp}]_{PR}\ ]_{PS}\ ]_{PW}\ \ ]_{PP}$

-at, -iʔ *-namʔut* *-an*

[2]Lexical suffixes can either be incorporated to the root or exist as the independent, although bound, half of a compound structure; see, for instance, Czaykowska-Higgins (1996, 1998) on lexical suffixes in Moses-Columbian.

The remainder of this chapter and the next are devoted to the examination and analysis of stress in words resulting from the addition to stems of affixes from the two main suffix classes (namely, lexical and grammatical suffixes). While the analysis of lexical suffixation tends to focus on simple root–suffix combinations, that of grammatical suffixation often includes forms with multiple suffixes (and may include reduplicative forms as well); this is because grammatical suffixes for the most part follow lexical suffixes, which tend to be closer to the root. The chapter concludes with a discussion of how Squamish words must be represented in terms of prosodic domains: as already noted, the interface between prosodic and morphological domains plays an important role in the analysis of stress in Squamish words.

6.1. Lexical suffixes and suffixation in Squamish: basic patterns

Like typical Salishan languages, Squamish has a substantial number of suffixes with lexical meaning (at least 65, approximately half of which have meanings related to human body parts). In addition, Kuipers (1967) lists a further 55 "formative" suffixes, a label he uses to identify affixes with generally indeterminate meaning; however, at least some of these so-called formatives plainly have lexical meaning as well; for instance, the suffix /=mix̣^{w}, məx̣^{w}/ is commonly found in names of (groups of) people, as in /snanáyməx^{w}/ 'Nanaimo people'; /stə́lməx^{w}/ 'person, Indian'; /ʔúx^{w}umix^{w}/ '(population of) village'. Like roots, lexical suffixes carry lexical meaning; however, unlike roots, they are unable to exist independently, but are always and only found bound, in combination with some root. See

Appendices B and D for a list of lexical suffixes in Squamish (B) and examples of their use in polymorphemic words (D); the Kuipers corpora serve as the source in both cases.

Squamish words resulting from the concatenation of a root and a single lexical suffix exhibit one of three stress patterns, as shown in (5); thus, stress may surface on one or the other of the morphemes but not on both (5a), or it may surface on both morphemes (5b), or it may fall on an epenthetic schwa between the two morphemes and not on either morpheme (5c). Illustrative examples are provided for each of the three patterns in (5).

(5) Stress patterns in Root=LexS concatenations
- a. Only one morpheme is stressed
  - i. The root is stressed
    /√cíq=alap/ 'get stabbed in the thigh'
  - ii. The LexS is stressed
    /√caq^{w}=áyaʔn/ 'have one's ear bleeding'
- b. Both morphemes are stressed[3]
    /√t'áqaʔ=áyus/ 'have a black eye'
- c. Stress falls on an epenthetic vowel between morphemes
    /√x̣əyx̣-ə́=wiɬ/ 'war-canoe'

By far the most commonly occurring in the Kuipers corpus are the patterns in (5a), where a single stress falls either on the root or on the suffix. It is certainly possible, however, for stress to appear on both root and suffix, as indicated in (5b); in this case one of the prominences is usually primary, and the other secondary.[4] In the third pattern type,

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[3]As remarked elsewhere, degree of prominence is not marked in the Kuipers Squamish corpora.

[4]Although Kuipers (1967, 1969, 1984) does not mark them as such, primary/secondary stress can be conjectured on the basis of alternative forms; for instance, the fact that /q'áp'ačíʔn/ 'seize s.o.'s hand' has a variant with a single stress on the suffix (and none on the root) suggests that primary stress is on the suffix.

given in (5c), word stress falls on neither the root nor the suffix, but on an epenthetic schwa imposed between the two morphemes.

Generally speaking, the patterns listed in (5a) and (5b) are not to be differentiated from each other. In general the multiple stress patterns of (5b) are seen, if at all, in words that are more than three syllables in length; this is because stress in Squamish is rhythmic, falling on alternating syllables up to, but not including, the final syllable in the word. However, as has already been mentioned, secondary stress, as in many Salishan languages (see, for instance, Czaykowska-Higgins and Kinkade 1998), does not surface consistently. Although they come into the discussion later in this chapter (see especially section 6.2.2), the mechanics of multiple stress are not important to the analysis in this section. Rather, the main concern here is to determine which morpheme, whether the root or the lexical suffix, commands stress in the word. Thus, although the examples in this section tend to be of concatenations recorded by Kuipers with a single stress, the possibility of a second stress in longer words must be assumed.[5]

For the most part, the patterns of stress seen in Root=LexS words can be accounted for in terms of two factors, namely, that of vowel quality in the root and that of lexical accent. The discussion and analysis that follow (after a small excursus into the prosodic categorization of lexical suffixes) begin by examining combinations in which neither the root nor the lexical suffix contains lexical accent.

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[5]Secondary stress (`), where marked in the data, is marked as per examples cited in Bar-el and Watt (2000).

6.1.1. Prosodic categorization of lexical suffixes

A crucial part of the analysis of stress in CVC- reduplicated stems in Chapter 5 depended on the categorization of the reduplicant as a root. A number of researchers have contended that lexical suffixes in some languages are also rootlike entities (for instance, Carlson 1990 argues for Spokane, Urbanczyk 1996[2001] for Lushootseed, Blake 2000a for Lillooet and Sliammon, and Czaykowska-Higgins, in press, for Moses-Columbian, that lexical suffixes in these languages are bound roots). The question to be addressed in this section is not whether lexical suffixes are historically bound roots, but how lexical suffixes should be represented in the analysis of stress in Squamish Root=LexS words, whether as roots or as suffixes.

An examination of the structure of lexical suffixes in the Kuipers corpora (see Appendix B) shows that 78 of 120 (65%) lexical suffixes are either vowel-initial (e.g., /=ač/ 'hand, arm') or have vowel-initial variants (for instance, /=q^{w}, əq^{w}/ 'head'). If consonantal suffixes (that is, suffixes without any vocalic content, such as /=cq/ 'chin') are factored out, this percentage jumps to 75 percent. The majority of lexical suffixes, therefore, are vowel-initial, and in this feature they do not resemble roots, which are required to have onsets (Chapter 2, especially section 2.2.5).

Moreover, as a further examination of the data shows, lexical suffixes are consonant-final, almost without exception. When lexical suffixes are polysyllabic (which is the case approximately 25% of the time), it usually results from the combination of two lexical suffixes (as in /-q^{w}uy-ač/ 'finger'), or the addition of a connective element such as /-ay/ (for instance, in /-ay-əqʷ/ ‘top, top of head’), or both (for instance, /-ay-əqʷ-šn/ ‘knee’, which combines the connective /-ay/ with two lexical suffixes, /=əqʷ/ ‘head’ and /=šn/ ‘foot, leg’).

The shape of lexical suffixes in Squamish, then, argues for their analysis as a suffix and not a root in that the majority of lexical suffixes adhere to a canonical VC shape. Support for a categorization of lexical suffixes as a suffix comes from the observation that in terms of stress, the majority of lexical suffixes behave exactly like a number of grammatical suffixes, including the /-iʔ/ inchoative and the /-at/ transitive. Lexical suffixes will consequently be analysed here as suffixes, and not as roots.[6]

6.1.2. Root=LexS words with no lexical accent

Examples of Root=LexS words without lexical accents are listed in (6), where (6a) contains combinations in which the root has a full vowel, (6b), combinations with schwa-based roots ending in a resonant, and (6c), combinations with obstruent-final schwa-based roots.

(6) Root=LexS: No lexical accents

a. Root has full vowel: stress on root

√p’íč=ač	‘get one’s hand caught’	√qíx̣=us	‘blind’
√cíq=aʔan	‘get stabbed in the cheek’	√x̣ʷáy=ač	‘have a paralysed arm’

b. Root has schwa followed by resonant

i. Stress on root

√t’ə́m=us	‘hurt one’s face’	√q’ʷə́l=aʔn	‘ear’

√xʷí=ayus ‘break through (ab. sun, moon)’ (√xʷəy)

ii. Stress on suffix

√təm=áyʔ	‘want; get hungry for’	√q’əw=ús-m	‘pull in one’s head’
√c’əh=ús	‘get hit in the face’	√c’əh=áyus-n	‘punch s.o. in the eye’

[6]However, given a minimal requirement for stems that they contain roots, lexical suffixes in (dual-stem) Root=LexS compound structures (analysed in section 6.2.2) are presumed to occupy a PRoot position.

c. Root has schwa followed by obstruent: stress on suffix

√k’ʷq=áč	‘have branch hanging off’	√qxʷ=ús	‘be assembled (people)’
√t’x̣=áyʔus	‘make lightning’	√həɬ=áyʔus	‘of good colour’

In the words listed in (6), which in terms of stress orientation are exemplary of the majority of Root=LexS combinations in Squamish, it can be observed that stress falls on the root if it contains a full vowel, as shown by the forms in (6a), but on the suffix when the root is schwa-based and contains a post-schwa obstruent, as seen in (6c). When schwa in the root is followed by a resonant, as in (6b), the results are less predictable in that stress falls on the root in some cases (6b.i), and on the suffix in other cases (6b.ii). The motivation for choosing one of the (6b) patterns over the other is not transparent; it is apparently not dependent on the resonant’s place of articulation[7]: at least /m, n, w/ are found root-finally in both stress patterns.

The stress patterns seen in (6) are for the most part reminiscent of those seen in bare roots, where stress fell on the penultimate syllable if it contained a full vowel (cf. 6a) or a schwa–resonant sequence (cf 6b.i), but not when it contained schwa followed by an obstruent (cf. 6c). However, stress in bare roots did not exhibit the variability found in the stress patterns of Root=LexS words with root-final resonants.

It was mooted in Chapter 4 that the stress differences observed in schwa-based roots and complex forms where schwa is followed by a resonant on the one hand, and an obstruent on the other, fall out from the different ways in which these consonants are parsed

[7]Schwa-based roots ending in /h/ are an exception in that they tend to appear only in patterns with suffix stress. Recall that /h/ is classified by Kuipers (1967) as a resonant (see section 2.1.1.2 of Chapter 2).

following another consonant. While the obstruent (K) in CKVC is parsed as an onset (just as intervocalic consonants are), the resonant in CRVC is parsed as a coda; the latter is due to a phonological rule stating that a resonant is syllabic following another consonant (see Chapter 2, section 2.1.1.1). However, the examination of resonant glottalization at junctural boundaries in Chapter 4 (section 4.2.2) indicated that a nonfinal resonant must systematically be parsed as a coda, even when it follows a full vowel. It was demonstrated in that section that within a foot (for instance, in the root /k^{w}ə́laš/ 'to shoot'), the resonant does not undergo glottalization, but supplies an onset to the following syllable by means of ambisyllabicity. In contrast, when the resonant is situated at a foot edge, resonant glottalization usually takes place, allowing the onset requirement to be satisfied by the epenthetic glottal (for instance, in /híhilʔit/ 'roll; tr.', footed (híhil)(ʔit); compare the unreduplicated form /hílit/). The constraint CODA-R, which ensures that resonants are parsed into codas, is virtually undominated, ranking even above ONSET.

Chapter 4 showed further that not only do resonants (and not obstruents) syllabify as codas in the environment just described, but, more than that, resonant consonants in general make better codas than do obstruents. Thus, although WEIGHT-BY-POSITION (Hayes 1989) demands that all consonants be moraic when in syllable codas, the ranking *μ/K >> WBYP >> *μ/R places a greater penalty on assigning weight to obstruents in codas than it does when the coda is a resonant. Together, these factors are able to explain why schwa in a penultimate syllable (whether in a bare root or in a disyllabic complex form) can be stressed when it is followed by a resonant, but not when the following consonant is an obstruent: the penult in /CəR.VC/ contains a coda, and therefore the possibility of weight (as well as minimal sanctions against assigning that weight); in contrast, /Cə.KVC/ has no weight-potential in the penult because the penult is codaless.[8]

Translating these factors into an OT account of stress in suffixed forms (as elsewhere) requires their strict ranking as CODA-R >> ONSET >> *μ/K >> NOCODA >> WBYP >> *μ/R. These constraints are interleaved with other constraints operative in the language as in (7).

(7) CODA-R >> ONSET >> *μ/K >> RT=FT&FTBIN-μ >> ALIGNL-WD >> ALIGNR-WD >> NOCODA >> WBYP >> FTBIN-σ >> WSP′ >> ROOT=FOOT >> FTBIN-μ >> FTFORM=TROCHEE >> PARSE-σ, *μ/R

Recall that FTBIN-σ and FTFORM=TROCHEE define the optimal foot in Squamish as being a binary (syllabic) trochee, and that ALIGNL-WD-FT and ALIGNR-WD-FT oversee the proper alignment of foot and prosodic word at their left and right edges, respectively. RT=FT&FTBIN-μ passes any candidate that obeys one or the other of the relatively low-ranked ROOT=FOOT and FTBIN-μ. WSP′ is responsible for assigning prominence to syllables that contain weight.

The tableaux in (8-9) analyse stress in Root=LexS concatenations consisting of a full-vowelled monosyllabic root in combination with a monosyllabic and a disyllabic suffix, respectively. Recall that only full vowels have intrinsic weight; they are therefore always shown as linked to a mora in the tableaux. Consonants, on the other hand, are subject to weight by position and, as such, they are not automatically given moraic status, even in codas: although WBYP demands that codas be assigned weight, the constraint ranking *μ/K

[8]Recall that schwa is weightless.

>> WBYP >> *μ/R gives resonants the advantage over obstruents in this respect; as well, extrinsic weight may not be assigned (even in the case of resonants) if to do so would result in an overly heavy foot (recall that the best feet contain exactly two moras).

According to RT=FT&FTBIN-μ, the best candidate in (8) is one that encloses a root within a foot and/or has exactly two units of weight in any and all feet formed on the word; for instance, see (8a), which obeys both parts of this metaconstraint. However, adhering to RT=FT&FTBIN-μ results in violations against either or both ONSET (because the suffix is vowel-initial) and *μ/K (since obstruent codas are preferred not to have weight). On the other hand, failing to assign moraic status to the (obstruent) coda is in contravention of WBYP, while non-exhaustive parsing of the disyllabic word violates FTBIN-σ. Thus, the best foot construction for /√p’ič=ač/ is one that encompasses both syllables in a single foot and, at the same time, contains exactly two units of weight (8e, f). Of these, the trochee in (8e) is preferred over the iamb in (8f) because FTFORM=TROCHEE.

(8) /p’íčač/ ‘get one’s hand caught’

μ μ √p’ič=ač	ONSET	*μ/K	RT=FT& FTBIN-μ	ALIGN L-WD	ALIGN R-WD	WBYP	FTBIN -σ	FT FORM	PARSE -σ
a. μμ μμ (p’íč)(ač)	*!	**					**	*	
b. μ μ (p’i)(čáč)			*!			*	**	**	
c. μ μ (p’í) čač			*!		*	*	*	*	*
d. μ μ p’i (čáč)			*!	*		*	*		*
☞ e. μ μ (p’í.čač)						*			
f. μ μ (p’i.čáč)						*		*!	

The analysis in (8) shows that the optimal stress outcome for a disyllabic Root=LexS word has stress surfacing on a full vowel in the root. The same is true when the combination is trisyllabic and consists of a monosyllabic root and a disyllabic suffix, as seen in (9). The analysis in (9) considers only candidates that are in adherence with the high-ranking Onset constraint; a form like (cíq)(a.ʔan), which leaves the suffix onsetless by enclosing the root in a foot, is therefore not included among the candidates listed in the tableau.

(9) /cíqaʔan/ ‘get stabbed in the cheek’

μ μ μ √ciq=aʔan	*μ/K	Rt=Ft& FtBin-μ	Align L-Wd	Align R-Wd	WbyP	FtBin -σ	FtForm= Trochee	Parse -σ
a. μ μ μ (cí)(qa.ʔan)		*!			*	*	*	
b. μ μ μ (ci)(qá.ʔan)		*!			*	*	*	
c. μ μ μ (cí.qa)(ʔan)		*!			*	*	*	
d. μ μ μμ (cí.qa)(ʔan)	*!					*	*	
e. μ μ μ ci (qá.ʔan)			*!		*			*
☞ f. μ μ μ (cí.qa) ʔan				*	*			*

In (9), candidate (d) is dismissed summarily for assigning a mora to an obstruent coda. Rt=Ft&FtBin-μ eliminates candidates (a-c): each posits one degenerate foot. Candidate (e) is ruled out for violations to AlignL-Wd, and the winner is (f), even though it fails to properly align a foot at the right edge of the word. This constraint ranking permits the final syllable of the preferred form to remain unparsed: as (9d) shows, a foot formed on the final syllable of this word is prevented from being wellformed by the strong prohibition against assigning weight to obstruents.

Tableau (9) showed that in a trisyllabic Root=LexS concatenation, the best form is one that leaves the final syllable unparsed.[9] In contrast, when a Root=LexS word has an even number of syllables, for instance, as in /t'áqaʔ=áyus/ 'have a black eye', both exhaustive parsing and multiple stress are possible. This is illustrated in (10). The constraints *μ/K and FTBIN-σ are obeyed by all candidates listed in (10), and are therefore not included in the tableau.

(10) /t'áqaʔ=áyus/ 'have a black eye'

μ μ μ μ √t'aqaʔ=ayus	CODA-R	ONSET	RT=FT& FTBIN-μ	ALIGN R-WD	WBYP	FTFORM= TROCHEE	PARSE-σ
☞ a. μ μ μ μ (t'á.qa)(ʔá y us)					**		
b. μ μ μ μ (t'a.qá)(ʔa y ús)					**	*!*	
c. μ μ μ μ (t'á.qa) ʔa y us				*!	*		**
d. μ μ μ μ (t'á.qaʔ)(á.yus)	*!	*			**		
e. μ μ μ μ (t'á.qaʔ) a.yus	*!	*		*	**		**

In (10), candidates (d-e) violate both CODA-R and ONSET, in the first instance, by failing to parse the intervocalic resonant in the suffix as a coda, and in the second instance,

[9]Because unfooted, the final syllable is not considered for stress, even secondary stress. The forms recorded by Kuipers in the 1960's show a general reluctance on the part of speakers of that day to place any degree of stress on the final syllables of words; judging from Bar-el and Watt's more recent work, this is not an issue for today's speakers. As mentioned in Chapter 1, the analysis of stress in this dissertation is based on the Kuipers corpora.

by parsing the root-final consonant as a coda rather than as an onset. While (a-c) parse both of these intervocalic segments correctly, (a, b) are better candidates than (c), which fails to align the right edge of a foot with that of the word. Of (a, b), the winner is (a), which has only trochaic feet, in contrast to (b), whose feet are iambic. Because the word contains an even number of syllables, two wellformed feet are possible (cf. the analysis of /cíqaʔan/ in 9), each with stress.[10]

The analyses in (8) through (10), which show that the root portion of a Root=LexS word with no lexical accents is favoured for stress if it contains a full vowel, cannot unequivocally be extended to forms involving roots with schwa. The comparative data, previously listed in (6), are repeated here in (11). Note once again that the words in (11b), which are based on roots containing schwa followed by a resonant, show variable stress outcomes, with some mimicking the pattern found when the root contains a full vowel (11a), in which case the root is stressed, and others copying the stress pattern found when the schwa-based root is obstruent-final (11c), in which case stress is on the suffix.

[10]The form represented by candidate (10a) accurately portrays the word as transcribed by Kuipers (that is, with two acute accents). However, as Kuipers (1967) himself points out, in cases of multiple stress, only one of the stresses marked is primary, and this tends to be the leftmost one. The expected stress outcome for the word analysed in (10) would thus be /táqaʔàyus/; this result can be achieved by including the constraint LEFTMOST in the lineup (recall from Chapter 5 that LEFTMOST situates the head foot of a prosodic word at the left edge of the prosodic word and, further, that FTFORM=TROCHEE >> LEFTMOST). Since this dissertation relies on the Kuipers corpora, and since Kuipers did not mark degree of stress, left/right orientation of main word stress is not of primary concern here.

(11) Root=LexS: No lexical accents

a. Root has full vowel: stress on root

√p’íč=ač	‘get one’s hand caught’	√qíx̣=us	‘blind’
√cíq=aʔan	‘get stabbed in the cheek’	√x̣ʷáy=ač	‘have a paralysed arm’

b. Root has schwa followed by resonant

i. Stress on root

√t’ə́m=us	‘hurt one’s face’	√q’ʷə́l=aʔn	‘ear’

√xʷí=ayus ‘break through (ab. sun, moon)’ (√xʷəy)

ii. Stress on suffix

√təm=áyʔ	‘want; get hungry for’	√q’əw=ús-m	‘pull in one’s head’
√c’əh=ús	‘get hit in the face’	√c’əh=áyus-n	‘punch s.o. in the eye’

c. Root has schwa followed by obstruent: stress on suffix

√k’ʷq=áč	‘have branch hanging off’	√qxʷ=ús	‘be assembled (people)’
√t’x̣=áyʔus	‘make lightning’	√həɬ=áyʔus	‘of good colour’

As previously mentioned, the stress differences noted between the Root=LexS words in (11b.i) versus (11c) are along the lines of those discussed in Chapter 3, where it was found that in bare roots, a syllable containing schwa is able to attract stress when schwa is followed by a resonant, but not when an obstruent follows it. Recall from discussions in Chapter 4 and earlier in this chapter that the stressability of schwa in the environment of a following resonant (but not an obstruent) follows from a rule that parses resonants into codas.

As regards stress, the role of CODA-R is noncrucial in Root=LexS words formed on roots containing full vowels: full vowels are intrinsically moraic, and their syllables are therefore automatically targeted for stress. In contrast, in the analysis of Root=LexS words involving schwa-based roots, the high-ranking CODA-R plays a crucial role in deciding whether the root can be stressed or not because parsing a root-final consonant as a coda gives the otherwise weightless syllable in the root weight, and weight in a syllable makes the syllable visible to stress. This is illustrated in the following tableaux, which give comparative analyses of Root=LexS words involving schwa-based roots ending in a resonant on the one hand, and those ending in an obstruent on the other.

The first analysis, which is of a disyllabic form consisting of a CəR root combined with a monosyllabic suffix, shows why stress in such cases is permitted to land on the root, just as it did when the root contained a full vowel: although the form contains only one inherent mora (and that in the final syllable), CODA-R >> ONSET creates an environment in which additional moras can be assigned (and in the penultimate syllable). This, combined with the relatively low penalty attached to assigning moraic status to resonants, permits the default (penultimate) stress pattern to surface. DEP-NUC, an anti-insertion constraint, states specifically that a nucleus in the input must also be present in the output.

(12) /t’ə́mus/ ‘hurt one’s face’

μ √t’m=us	CODA-R	ONSET	RT=FT& FTBIN-μ	WBYP	FTBIN-σ	WSP′	DEP-NUC	FTFORM= TROCHEE	*μ/R
a. μ (t’mús)	*!		*	*	*				
b. μ (t’ə.mús)	*!		*	*			*	*	
c. μ μ (t’əm.ús)		*!		*		*	*	*	
d. μ μ (t’ə m ús)				*		*	*	*!	*
☞ e. μ μ (t’ə́ m us)				*		*	*		*
f. μ (t’ə́ m us)			*!	**		*	*		
g. μ μ (t’ə́m)(us)		*!		*	**	*	*	*	*

In (12), candidates (a, b) are eliminated as a result of violations to CODA-R. Although candidate (b) forces a disyllabic foot (unlike (a), which has a monosyllabic one), it parses the intervocalic resonant as if it were an obstruent, that is, as an onset rather than as a coda; because this leaves the penultimate syllable without weight, there is no alternative but to stress the final syllable (erroneously). Candidates (c, g) correctly parse the resonant as a coda, but fails to provide an onset for the following syllable. Candidate (f), which differs from the winning candidate only in that it fails to link a mora to the ambisyllabic resonant, cannot pass RT=FT&FTBIN-μ because it violates both of the conjoined constraints (unlike (e), which violates ROOT=FOOT, but obeys FTBIN-μ). Candidate (e) then eventually wins over (d) because, unlike the latter, it obeys FTFORM=TROCHEE. As a result, word stress falls on the root, just as in combinations with full vowels in the root.

A crucial point of the analysis in (12), which involves a resonant-final schwa-based root, is that in addition to being parsed as a coda, the resonant must be assigned weight; the root's syllable contains no inherent weight, since it lacks a full vowel, and its ability to be stressed is therefore contingent on weight provided in the resonant. In contrast, in similar combinations with a full vowel root, the best solution is one that does not assign weight to the intervocalic resonant, since to do so would result in violations to both components of RT=FT&FTBIN-μ. This is illustrated in (13).

(13) /x̣ʷáyač/ ‘have a paralysed arm’

μ μ √x̣ʷay=ač	CODA-R	ONSET	RT=FT&FTBIN-μ	WBYP	FTBIN-σ	WSP′	FTFORM=TROCHEE	*μ/R
a. μ μ (x̣ʷá.yač)	*!			**		*		
b. μ μ (x̣ʷáy.ač)		*!		**		*		
☞ c. μ μ (x̣ʷá y ač)				**		*		
d. μ μ μ (x̣ʷá y ač)			*!	*		*		*

The tableau in (13) shows that although the intervocalic resonant in a Root=LexS word formed on a root with a full vowel is parsed similarly to that in a Root=LexS word formed on a schwa-based root (given CODA-R >> ONSET), the optimal candidate does not contain added weight in the resonant. In fact, any candidate that does assign weight to the resonant, such as that in (13d), is rejected because its foot contains an excess of weight.

The analysis in (12) is of a combination in which the resonant-final schwa-based root bears stress (see the forms in (11b.i)). This analysis cannot account for variants like those listed in (11b.ii), which feature stress on the suffix. Note that the suffix is stressed primarily in cases where either the root-final consonant is /h/ or the root is obstruent-final and the suffix resonant-final. An examination of similar words in the corpus shows that stress is typically not attracted to schwa-based roots ending in /h/[11]; in this way at least, /h/ does not behave like a resonant, but rather like an obstruent (see discussion in Chapter 2, section 2.1.1.2, and recall Clements’ 1990 claim that laryngeals are outside the sonority scale). As

[11]An exception is /c’ə́ht/ (~ /c’át/) ‘hit; tr.’ (cf. /pə́nt/ ‘to bury’, /cx̣ə́t/ ‘push (a person)’).

such, the best analysis for words like /c'əhús/ 'get hit in the face' is one, like that in (14), which treats the root-final /h/ as an obstruent.

In contrast to Root=LexS words like /t'ə́mus/, analysed in (12), in a disyllabic form combining a CəK or a Cə*h* root with a monosyllabic suffix, stress cannot but land on the suffix: because CODA-R does not apply, syllabification is governed by ONSET, and the obstruent is forced into an onset (and not a coda), leaving no possibility of (additional) weight in the penult. This is illustrated in (14). ONSET, ALIGNL-WD, and ALIGNR-WD are obeyed by all candidates listed in the tableau, and are therefore excluded from the tableau.

(14) /c'əhús/ 'get hit in the face'

μ √c'h=us	*μ/K	RT=FT& FTBIN-μ	WBYP	FTBIN -σ	WSP′	DEP- NUC	FTFORM= TROCHEE
a. μ (c'hús)		*	*	*!			
b. μ (c'ə́.hus)		*	*		*!	*	
☞ c. μ (c'ə.hús)		*	*			*	*
d. μμ (c'ə.hús)	*!					*	*

In (14), candidate (d), which is the only candidate to assign a mora to the single coda in the foot, fails because *μ/K >> RT=FT&FTBIN-μ. The rest of the candidates fare equally on WBYP, as well as on RT=FT&FTBIN-μ. However, candidate (a), which is monosyllabic, is subsequently eliminated by FTBIN-σ, while (b) is ruled out by the WSP′ (because the final syllable has weight but no stress assigned to it). The winning candidate, then, is (c), which is a disyllabic iamb with a weightless initial syllable.

The analysis in (14) suffices for CəK roots in general (that is, as well as for Cə*h* roots) except in that CəK roots in combination frequently surface without schwa, for instance, as in /qx̣ʷús/ (from √qəx̣ʷ=us) 'be assembled (people)' (but cf., for example, /qəx̣áɬ/ 'much, many', in which schwa is extant). This may be partially due to the fact that, to a limited extent, juxtaposed obstruents are permitted in the (initial) onsets of roots (see Chapter 2, section 2.2.3.1). Aside from this, it is not clear whether the presence or absence of schwa in these complex forms is a matter of free variation or, if not, what motivates schwa's inclusion or exclusion from surface representation. It is possible, as Urbanczyk (p.c.) suggests, that a syllabic element is indeed present and represented by a voiceless schwa in these cases (for instance, as [qə̥x̣ús]), although Kuipers' (1967) does not represent them in this manner.

In a comparison of the analyses for (12) and (14), which feature Root=LexS words in which the schwa-based root ends in a resonant (12) and in an obstruent (14), respectively, it can be observed that both forms prefer a disyllabic foot shape. The fact that they have different stress configurations can be attributed to the presence or absence of potential weight-bearing units in the penultimate syllable: in the absence of a full vowel, a syllable must have a coda if it is to be assigned weight.

The tableau in (15) analyses a trisyllabic Root=LexS word formed on a schwa-based root ending in an obstruent, namely, /t'x̣=áyʔus/. ONSET is again omitted, as is *μ/K: no candidate in the list violates the former constraint, and all obey the latter.

(15) /t'x̣áyʔus/ 'make lightning'

µ µ √t'x̣=ayus	RT=FT& FTBIN-µ	ALIGN L-WD	ALIGN R-WD	WBYP	FTBIN -σ	FTFORM= TROCHEE	*µ/R	PARSE -σ
a. µµ µ t'(x̣áy.ʔus)	*!	*		*			*	*
b. µ µ t'(x̣áy.ʔus)		*!						*
c. µµ µ (t' .x̣áy)(ʔus)	*!			*	*	**	*	
d. µµ µ (t' .x̣áy)ʔus			*!			*	*	*
e. µµ µ (t'x̣áy.ʔus)	*!						*	
☞ f. µ µ (t'x̣áy.ʔus)				*				

In (15), candidates (a, c, e) are ruled out by RT=FT&FTBIN-µ. Candidates (b, d) are subsequently eliminated for failing to align a foot at the left and at the right edge of the word, respectively, and (f), which parses the entire Root=LexS complex into a single disyllabic foot, wins.

Notice the difference in outcome between this trisyllabic form, which contains a CəK root, and that which obtains when a CAK (full-vowel) root is involved (as is the case in the analysis of /cíqaʔan/; see 9): when the root has a full vowel, a disyllabic foot formed on the two leftmost syllables (which encompasses the root and the first syllable of the suffix) is wellformed and therefore passes RT=FT&FTBIN-µ (see 9f). In contrast, positing a disyllabic foot on the root and the first suffix syllable when the root features schwa followed by an obstruent results in a fatal violation to ALIGNL-WD (see 15d). (Although (9f) also violates ALIGNL-WD, the violation is not fatal in words containing an uneven number of syllables.)

In the former case, the best candidate posits an unparsed syllable at the right edge of the word, in the latter case, the best candidate is fully parsed.

The analysis of Root=LexS combinations thus far has taken into consideration only words in which neither the lexical suffix nor the root contain lexical accents. Although there are a limited number of accentually marked suffixes in Squamish, the presence of accent has the capacity to significantly alter the configuration of stress in words. The discussion in the next section provides an account of the effects of underlying accent on concatenations consisting of a root and an accentually marked lexical suffix. While Squamish does also have roots with accentual marking (that is, in addition to lexical suffixes thus marked), the default stress pattern is such that the stress effects are not transparent, the root being favoured for stress in any case (recall that roots are taken as accentually marked if in their bare forms they fail to adhere to a predictable pattern of stressing a penultimate syllable with weight). In fact, an accented root would have to be schwa-based to show these effects, and examples of schwa-based accented roots have not been found in the corpus. Therefore, such examples are not discussed here.

6.1.3. Root=LexS words with lexical accent

It was pointed out earlier that lexical accentuation has only a small part to play in the overall stress patterns of Squamish, as the vast majority of morphemes in Squamish are unmarked for accent. Recall that a lexically accented morpheme is a morpheme whose representation in the lexicon includes a special marking that shows either that it is accented (inherently) or that it is inherently unaccented (or unstressable). While roots are here deemed lexically accented if their stress patterns deviate from the default established in

Chapter 3, suffixes are considered accented if they always carry the main word stress, even with full-vowel roots, and they are considered unaccented if they consistently fail to carry primary stress, even with schwa-based roots. Inherently unaccented roots were not found in the corpus; if existing, such roots would be expected to avoid stress at all costs, given that there are cross-linguistic tendencies to value faithfulness to morphological roots over faithfulness to affixes (see discussion in section 6.2.2).

Root=LexS words in which stress is affected by lexical accent are exemplified in (16-17), where (16) contains examples of words with an accented lexical suffix, and (17), examples with lexical suffixes that are unaccentable.

(16) Root=LexS words with lexical accents: accented suffix[12]
a. √caq^{w}=áyaʔn ‘have one’s ear bleeding’ (cf. √cíq=aʔan ‘get stabbed in cheek’)
b. s-√q^{w}əh=áyaʔn ‘hole through the ear’

(17) Root=LexS words with lexical accents: unaccented suffix
a. n-√c’áq=iʔəq^{w} ‘bald’ (< =ayʔəq^{w})
b. √cə́x^{w}=iʔəq^{w} ‘get hit on the head’ (cf. √cəh=áyus ‘get punched in eye’)

In the exemplary data, the effects of lexical accent in the suffix on overall word stress are easily transparent: the forms in (16) show that when the suffix is accented it will get the stress regardless of the quality of the vowel in the root, and those in (17) show that when the suffix is unaccented stress falls on the root, again regardless of the quality of its vowel.

[12]Comparative words with no lexical accent are given (in parentheses) only in those cases where the presence of lexical accent results in a stress pattern different from that predicted by the default established in the previous section.

The analysis of stress in Root=LexS words where at least one morpheme contains lexical accent utilizes a constraint proposed by McCarthy (1995) as a means of ensuring prosodic faithfulness between an input form and its corresponding output form; see (18).

(18) HEAD-MAX (McCarthy 1995)
If $\alpha \in S_1$ is a prosodic head in a word and $\alpha \Re \beta$, then β is a prosodic head.

HEAD-MAX states that a segment earmarked as a prosodic head in the input will also be a prosodic head in the output. In his account of prosodic faithfulness in Cupeño, Alderete (1996) provides the following insightful commentary on the application of HEAD-MAX.

> For concreteness, I assume that the prosodic category relevant to the meaning of HEAD-MAX is the moraic head. Therefore, HEAD-MAX asserts that, for every underlying segment dominated by a stressed mora which has a correspondent in the output, the related output segment will also be dominated by a stressed mora. If it happens that a given input is not specified for prosodic structure, or an input prosodic head has no correspondent in the output, then faithfulness to input prosody is not relevant (Alderete 1996:6).

Adding HEAD-MAX to the lineup of phonological constraints utilized earlier in this chapter to explain the occurrence of default stress in Root=LexS words allows for a facilitative account of stress in Root=LexS words with lexical accents; this is demonstrated in the series of tableaux that follow. The preliminary tableaux sets in (19-20) provide an indication as to how stress configures in words that contain accented suffixes (19) and in words that contain unaccented suffixes (20); in each case, the expected result is shown for concatenations with both full-vowel and schwa-based roots, although the result is not in fact affected by the quality of the vowel in the root. To best show the effects of accent on stress, the tableaux utilize hypothetical (abstract) Root=LexS forms consisting maximally of a binary syllabic foot; however, the analysis of actual words will be undertaken later in the section. Note that lexical accent in the input is indicated as “+” for a morpheme that is inherently accented, “–” for one that is inherently unaccented. An output form that places stress on an input “+”-marked morpheme satisfies HEAD-MAX; one that stresses an input “–”-marked morpheme violates it.

(19) a. Root=LexS with accented LexS: full vowel in root

+ /ROOT=LEX/	HEAD -MAX	FTFORM= TROCHEE
a. √CÁC=LEX	*!	
☞ b. √CAC=LÉX		*

b. Root=LexS with accented LexS: schwa in root

+ /ROOT=LEX/	HEAD -MAX	FTFORM= TROCHEE
a. √Cə́C=LEX	*!	
☞ b. √CəC=LÉX		*

The tableaux set in (19), which shows the analysis of Root=LexS words combining an accentually unmarked root with an inherently accented lexical suffix, demonstrates that faithfulness to lexical accent is more important than is adherence to trochaic foot form; thus, stress falls on the lexical suffix in combinations with a full-vowel root (19a), as well as in those with a schwa-based root. In combinations featuring a schwa-based root ending in an obstruent, this result does not differ from one where both morphemes are accentually unmarked (cf. the analysis of /√qəh=ús/ in 14), as stress will fall on the lexical suffix whether or not it is accented. However, the result does differ from the default when the root contains either a full vowel or a syllabic resonant (cf. the analyses of /√p’íč=ač/ and

/√t'ə́m=us/ in tableaux 8 and 12, respectively), since these roots, which have the potential of bearing weight, are ordinarily favoured for stress; compare /caq^{w}=áyaʔn/ 'have one's ear bleeding', which has an accented suffix, with √cíq=aʔan 'get stabbed in cheek', where the suffix is accentually unmarked.

In contrast to (19), where deviations from the default stress pattern will be found in combinations involving a root containing either a full vowel or a schwa–resonant sequence, when the suffix is inherently unaccented, as in (20), the divergent results will be seen in combinations with obstruent-final schwa-based roots, as the unaccentability of the suffix forces stress onto the root even in the absence of weight (or weight-potential) in that morpheme; compare /cə́x^{w}=iʔəq^{w}/ 'get hit on the head', which features an inherently unaccented suffix, with /cəh=áyus/ 'get punched in eye', in which the suffix is accentually unmarked.

(20) a. Root=LexS with unaccented LexS: full vowel in root

– /ROOT=LEX/	HEAD-MAX	FTFORM=TROCHEE
☞ a. √CÁC=LEX		
b. √CAC=LÉX	*!	*

b. Root=LexS with unaccented LexS: schwa in root

– /ROOT=LEX/	HEAD-MAX	FTFORM=TROCHEE
☞ a. √Cə́C=LEX		
b. √CəC=LÉX	*!	*

Although the outcome in (20a), which stresses the full vowel in the root, would be the expected result even if the suffix were not unaccentable, that in (20b), which stresses a schwa-based root, is not. Again, HEAD-MAX >> FTFORM=TROCHEE accounts for the fact that inherently unaccented lexical suffixes do not get stress even when attached to schwa-based roots, regardless of the quality of the post-schwa consonant.

The atypical stress results seen in (19-20) are demonstrated with actual Squamish words in (21-22). The forms evaluated in these tableaux are /√caq^{w}=áyaʔn/ ‘have one’s ear bleeding’, which features an accented suffix appended to a root with a full vowel (21), and /√cə́x^{w}=iʔəq^{w}/ ‘get hit on the head’, which features an unaccented suffix combined with a schwa-based root (22). Note that the lexical suffix /=áyaʔn/ must be analysed as trisyllabic: since the final consonant, a resonant, follows another consonant (the glottal stop) in the same morpheme, it is syllabic.

Shortage of space forces the omission in (21) of a number of constraints, including *μ/K, which is obeyed by all of the listed candidates, FTBIN-σ, which is noncrucially violated by (d), and PARSE-σ, which is noncrucially violated by (d, e); recall that WBYP >> FTBIN-σ >> FTFORM=TROCHEE >> PARSE-σ.

(21) /caq^{w}áyaʔn/ 'have one's ear bleeding'

+ μ μ μ √caq^{w}=ayaʔn	HEAD-MAX	ONSET	RT=FT&FTBIN-μ	ALIGN L-WD	ALIGN R-WD	WBYP	FTFORM=TROCHEE
a. μ μ μ (cá.q^{w}a)(ya.ʔn)	*!		*			*	*
b. μ μ μ (ca.q^{w}á)(ya.ʔn)			*!			*	**
☞ c. μ μ μ μ (ca.q^{w}á)(ya.ʔn)							**
d. μ μ μ (caq^{w})(á.ya)ʔn		*!			*	**	*
e. μ μ μ ca(q^{w}á.ya)ʔn				*!	*	*	

In (21), candidate (a) assigns stress to the vowel in the accentually unmarked root rather than to one in the inherently accented lexical suffix, and fails for this reason: a prominence in the input must have a match in the output. Candidate (d) is eliminated for neglecting to provide the first syllable in the second foot with an onset; and candidates (b, e) are ruled out by RT=FT&FTBIN-μ and ALIGNL-WD, respectively. The winner then is the fully parsed candidate in (c): the high ranking of HEAD-MAX is responsible for the emerging of a candidate with two non-trochaic feet (compare candidates (a, c)).

The tableau in (22) analyses the occurrence of stress in a Root=LexS word in which a schwa-based obstruent-final root is in combination with an inherently unaccented suffix. As in (21), *μ/K, FTBIN-σ (which is noncrucially violated by candidates (a-d)), and PARSE-σ (noncrucially violated by (e)), are not shown. All listed candidates adhere to ALIGNL-WD, which is also omitted from the tableau.

(22) /√cə́x^{w}=iʔəq^{w}/ ‘get hit on the head’

– μ √cəx^{w}=iʔəq^{w}	HEAD-MAX	ONSET	RT=FT&FTBIN-μ	ALIGN R-WD	WBYP	WSP′	FTFORM=TROCHEE
☞ a. μ (cə́.x^{w}i)(ʔəq^{w})			*		*	*	*
b. μ (cə.x^{w} í)(ʔəq^{w})	*!		*		*		**
c. μ (cəx^{w})(í.ʔəq^{w})	*!	*			**		*
d. μ (cə́x^{w})(i.ʔəq^{w})		*!			*	*	*
e. μ (cə́.x^{w}i)ʔəq^{w}			*	*!	*	*	

In (22), HEAD-MAX summarily dismisses candidates (b, c), which assign stress to the full vowel in the inherently unaccented lexical suffix. Candidate (d) fails on ONSET, (e) on ALIGNR-WD, and this leaves (a) as the winning candidate, despite the fact that stress falls on syllable with neither inherent nor assigned weight.

The unusual stress patterns seen in (21), where the lexical suffix is preferred to a full-vowel root for stress, and in (22), where an obstruent-final schwa-based root gets the stress even in the presence of a full vowel in the suffix, obtain as a result of the high placement of HEAD-MAX in the constraint rankings, where it dominates all other constraints, including ONSET, RT=FT&FTBIN-μ, and both constraints governing foot alignment.

6.1.4. Summary: basic patterns

The analysis in the foregoing sections has shown that stress as it occurs in words consisting of a root and a lexical suffix is largely accountable in terms of the constraints and rankings listed in (23).

(23) HEAD-MAX >> CODA-R >> ONSET >> *μ/K >> RT=FT&FTBIN-μ >> ALIGNL-WD >> ALIGNR-WD >> WBYP >> FTBIN-σ >> WSP′ >> ROOT=FOOT >> FTBIN-μ >> DEP-NUC >> FTFORM=TROCHEE >> PARSE-σ, *μ/R

With regard to stress, the presence of lexical accent in one or both morphemes interacts with vowel quality in the root in the following way. An accented root gets the stress regardless. An accented suffix is stressed when it is affixed to a root that does not have lexical accent (hypothetically, also one that is inherently unaccented). Thus, the interaction of lexical accent with vowel quality in the root yields the following possibilities for the stress patterns examined in this section. As before, "+" above a morpheme indicates that it is inherently accented, while "–" designates it as inherently unaccented; "†" is used to indicate that the concatenation with which it is associated is unattested in the data.

(24) a. Róot=LexS

        +
   i. √CVC=LexS
   ii. √CAC=LexS
   iii. √CəR=LexS

        +   +
   iv. √CVC=LexS†

b. Root=LéxS

        –   +
   i. √CVC=LexS
   ii. √CəK=LexS

        –   –
   iii. √CVC=LexS†

The cases in (24a.iv) and (24b.iii) rate special mention as hypothetical representations of expected stress patterns if both root and lexical suffix were either inherently accented

(24a.iv) or inherently unaccented (24b.iii). Although concrete proof is not available in that the postulated accentual combinations were not found in the corpus, stress would be expected to fall on the root if both morphemes were accented, but on the suffix if both morphemes were unaccented; the hypothesized results in both instances are based on observations (for instance, by Kempley and Morton 1982, McCarthy and Prince 1995, and many others) that languages tend to value faithfulness to roots over faithfulness to affixes (see further discussion in section 6.2.2).

In summary, then, primary stress falls on the root without question if it is accented (24a.i). In combination with an accentually unmarked lexical suffix the root also bears stress if it contains either a full vowel (24a.ii) or a schwa–resonant sequence (24a.iii). Furthermore, stress falls on the lexical suffix if it, but not the root, is accented (24.i) or if it is affixed to a monosyllabic schwa-based root without lexical accents (24b.ii).

6.2. Semantically determined patterns of stress in Root=LexS words

The interaction of phonological and morphological factors described in the previous section is able to account for the occurrence of stress in a major portion of the Squamish data in the Kuipers corpus. However, there are items in the data where stress is not explained by these means; of special interest are Root=LexS words in which primary stress falls on the lexical suffix even when in combination with an accented root (an example is /staqiwúlł/[13] ‘colt’,

[13]Recall from earlier discussion in this chapter that a root is considered to be accented on the basis of its failure to adhere to predictable stress patterns pertaining to roots, which favour a penultimate syllable with weight; since /staqíw/ has final stress even though it contains a full vowel, and thus weight, in the penult, we can conclude that it is accented.

< √staqíw[14] 'horse', =ulɬ 'young specimen (human or animal)') and words in which stress falls neither on the root nor on the suffix but rather on an epenthetic schwa in between the two morphemes (for example, /tayə́wiɬ/ 'race-canoe'); more examples are listed in (25).

(25) a. pušúlɬ 'kitten' (cf. púš 'cat'; =ulɬ 'young specimen')
musməsúlɬ 'calf' (cf. músməs 'cow')
staqiwúlɬ 'colt' (cf. staqíw 'horse')
ʔitutáɬx̣a 'have no appetite (cf. ʔítut 'sleep'; =aɬx̣a 'throat')
k'ʷináɬ 'how many times?' (cf. k'ʷín 'how many?'; =aɬ 'times')
x̣aʔucnáɬ 'four times'
x̣ucnaɬšá 'forty' (cf. x̣aʔúcn 'four'; =aɬša 'multiple of ten')
tqačaɬšá 'eighty'

b. tamə́wiɬ 'what kind of boat?' (cf. tám 'what kind?'; =wiɬ 'belly, canoe, container')
tayə́wiɬ 'race-canoe' (cf. táy 'canoe race')
x̣əyx̣ə́wiɬ 'war-canoe' (cf. x̣ə́yx̣ 'war')
x̣əpiʔə́wiɬ 'large wooden platter' (cf. x̣əpáyʔ 'cedar')
c'ayʔə́wiɬtn 'canoe-shed' (cf. c'áyʔ 'be sheltered'; c'áyʔtn 'umbrella')

[14]Shaw (p.c.) notes that the cognate form in Musqueam, namely, /stqiw/, contains a single vowel, and suggests that /a/ in the penultimate syllable of Squamish /staqiw/ may be a surface manifestation of schwa in the vicinity of the uvular /q/, the point being that, with no weight in the penult, final stress in †/stəqíw/ would be predictable. This in fact accords with Bar-el and Watt's (1998) identification of the Squamish root as having the surface form [stəqéw] (from presumed underlying /stəqiw/). However, it is a matter of note that schwa in the surface form does not necessarily point to an underlying schwa; it could as well result from an underlying full vowel, given the high incidence of unstressed vowel reduction (see Kuipers 1967:35-36). In any case, according to Kuipers (1967:27), the expected surface representation of schwa in the environment of a preceding coronal and a following uvular is [æ] (for instance, as in /šəq/ [šæq] 'be finished'). To conclude, Kuipers (1967) consistently transcribes the root in question as /staqíw/, that is, with an underlying full vowel in the penult, and what is more, the form is not amended in his subsequent additions to the Squamish grammar and lexicon (found in Kuipers 1969, 1989). For these reasons, and because the analysis is based on the Kuipers' corpora, I feel justified in using /staqíw/ here.

What is interesting about the data listed in (25a) is that in contravention of the default stress patterns established in prior sections, the lexical suffix gets primary word stress even in cases where it is found in combination with an accented root, as is the case in /staqiwúlɬ/; recall that in the default pattern primary stress fell without question on the accented morpheme in such cases. In (25b), the listed examples contain a lexical suffix that is inherently unaccented: if the default stress pattern applied, primary stress should fall on the root, which has no accentual markings; and this should be the case regardless of vowel quality in the root (cf. /cə́x^{w}iʔəq^{w}/ 'get hit on head'). Instead, stress falls on an epenthetic between–morphemes schwa.

It is my contention that in the majority of such holdout cases stress is not idiosyncratic, although it may appear that way, but can be accounted for by an appeal to semantic factors, specifically, to the idea of semantic headedness in morphosyntactic structures; such an analysis is based on Revithiadou's (1999) theory of head dominance, discussed in the next section.

6.2.1. Revithiadou's (1999) theory of head dependence and head dominance

The foundation for Revithiadou's analysis of Salishan lexical suffixes comes from a paper by Czaykowska-Higgins (1996, 1998; see also Czaykowska-Higgins, Willett, and Bart 1996), which analyses lexical suffixes in Moses-Columbian as being of two types, namely, referential suffixes, which syntactically incorporate into the root, and non-referential suffixes, which form a lexical compound with the root. In Moses-Columbian, the two LexS types are apparently located in different morphological domains, with the non-referential, compound types being found in the same stem as the root, while the referential, incorporating types reside outside the morphological stem in the morphological word. This is illustrated in (26).

(26) Structure of words in Moses-Columbia Salish (Czaykowska-Higgins 1998:154)
Morphological structure:
$[_{MW}$ ASP $[_{MS}$ LOC RED $[_{MR}$ √ROOT$]_{MR}$ RED PA LS$]_{MS}$ LS TR O S$]_{MW}$
ITR ASP

Building on Czaykowska-Higgins' groundbreaking theoretical analysis of lexical suffixes in Moses-Columbian, Revithiadou (1999) claims that the outcome of stress in Root=LexS words in Salishan languages is dependent on the location of the head in the morphosyntactic structure. Thus, in words resulting from an incorporation process, as in the Thompson examples in (27), the lexical suffix (which as an argument of the root never heads the structure) gets the stress only in exceptional cases, specifically, when the lexical suffix is accented or when the root is schwa-based. In contrast, in Root=LexS compounds, like those in (28), the lexical suffix is a head modified by the root, and consequently stress habitually lands on the suffix regardless of the phonological and accentual properties that influence the outcome of stress in incorporating structures. All examples listed in (27-28) are cited in Revithiadou (1999), and all are from Thompson Salish and are attributable to Thompson and Thompson (1996); included in parentheses are the underlying forms of the individual morphemes involved, with lexical accent marked.[15]

[15]Default stress in Thompson falls on the leftmost full vowel or, in the absence of full vowels in the word, on the rightmost schwa.

(27) Root=LexS incorporations in Thompson (cited in Revithiadou 1999:229)

a.	k^{w}én=kn’	‘grab s.o. by the back (of clothes)’
	√*grasp=back*	(/k^{w}én/, /=íkn’/)
b.	n/paw’=íkn’	‘get a layer of ice on top’
	LOC/√*freeze=top*	(/paw’/, /=íkn’/)
c.	táx̣^{w}=yek’	‘lower s.t., s.o. with a rope’
	√*lower=rope*	(/táx̣^{w}/, /=eyek’/)
d.	n/páw’=ymx^{w}	‘the ground is frozen’
	LOC/√*freeze=ground*	(/paw’/, /-uymx^{w}/)
e.	cək=xə́n	‘get foot chopped or cut’
	√*hew=foot*	(/cək/, /=xən/)
f.	mək^{w}ʔ=ús-m	‘cover one’s face’
	√*wrap=face*-MIDDLE	(/mək^{w}ʔ/, /=us/)

(28) Root=LS compounds in Thompson (cited in Revithiadou 1999:231)

a.	piʔk^{w}=xə́n	‘dust from wheels (of vehicle)’
	√*dusty=foot, wheel*	(/pəy’ək^{w}/, /=xən/)
	ƛ’ix^{w}el=xə́n	‘different shoes’
	√*different=shoe*	(/ƛ’ix^{w}el/, /=xən/)
	weʔwit=xə́n	‘lower part of hind foot or leg’
	√*behind=foot*	(/weʔwít/, /=xən/)
b.	p’uƛ’=qín	‘misty, foggy on top of the mountain’
	√*misty=top*	(/p’uƛ’/, qín/)
	sip’ec’=qín	‘scalp (animal or person)’
	√*skin=head*	(/sip’éc’/, /=qín/)
c.	kawpuyh=ésk’iʔ	‘cowboy song’
	√*cowboy=song*	(kàwpúy/, /=esk’iʔ/)
	ʕəl’pix=ésk’iʔ	‘slahal (game) song’
	√*slahal=song*	(/ʕal’píx/, /esk’iʔ/)
	yuweh=ésk’iʔ	‘herbalist song’
	√*herbalist=song*	(yúweh/, /esk’iʔ/)

Although Revithiadou provides detailed analyses of Root=LexS constructions that are incorporating, she does not do so for compound Root=LexS structures. Instead, one is left to assume that such an analysis would be similar to that for Root-GrS combinations (see

Chapter 7). Both compound-type lexical suffixes and grammatical suffixes function as heads (and as such command stress) when combined with a root, in contrast to lexical suffixes in predicate structures, which do not.

In what follows, I make use of Revithiadou's hypothesis of the dominance of lexical heads to provide a semantically driven account of the more unusual stress patterns seen in Root=LexS formations in Squamish. The outcome of stress in formations in which the lexical suffix is head, or modifier–head structures, will be addressed in sections 6.2.2 through 6.2.4, while that in formations where the root is head, as is the case in head–theme predicate structures, will be discussed in section 6.2.5.

The analysis of stress in these sections rides on a number of assumptions about lexical suffixes put forward in Bar-el and Watt (2000). The first of these assumptions is that, like in Moses-Columbian, lexical suffixes in Squamish can be categorized in terms of their morphosyntactic status in relation to the root: some lexical suffixes, it seems especially those referring to body parts, are incorporated into the (verbal/adjectival) root, while others form lexical compounds with the root. I also adopt Bar-el and Watt's proposal that the incorporating process in Squamish results in lexical rather than in syntactic compounds (in contrast to Moses-Columbian). In addition, I agree with Bar-el and Watt that lexical compounding triggers the formation of a new domain for stress, specifically, a new prosodic stem, as opposed to lexical incorporation, in which both parts of a Root=LexS combination are contained in a single prosodic stem.

However, unlike Bar-el and Watt (2000), I do not assume that individual lexical suffixes are to be designated as inherently weak or strong, since a particular lexical suffix (for instance, /=wiɬ/ ‘belly, bowels, container’) may be incorporated into the root (“weak” structure; for instance, in /p’ák’^{w}(w)iɬ/ ‘launch a canoe’) in one context but may form a compound with the root (“strong” structure”; for instance, in /tayə́wiɬ/ ‘race-canoe’) in another.

6.2.2. Lexical suffix as head: modifier–head compound structures

In this section, I analyse the occurrence of stress in Root=LexS combinations in which the root and lexical suffix are in a modifier–head relation. I argue that in such cases the root and lexical suffix occupy different stem domains, as Bar-el and Watt (2000) propose is the case for most non-somatic lexical suffixes, including /=ulɬ/ ‘young specimen’; examples of combinations with this suffix are listed in (29).

(29) /=ulɬ/ ‘young specimen’ (based on Bar-el and Watt 2000)[16]

a. √puš=úlɬ ‘kitten’
b. √mix̣aɬ=úlɬ ‘bear cub’
c. √six^{w}aɬ=úlɬ ‘young child’
d. √mùsməs=úlɬ ‘calf’
e. √sq^{w}mày=úlɬ ‘puppy’
f. √staqìw=úlɬ ‘colt’
g. √shùhupìt=úlɬ ‘baby rabbit’

The first thing to notice about these data is that primary stress is always on the final syllable of the word, and thus on the lexical suffix. At first glance, it looks as though the

[16]In Bar-el and Watt these data are presented in the Squamish orthography. All examples listed are also found in Kuipers (1967), but marked with a single stress (which in all cases accords with the primary stress in the forms here). The words in (29a, d, f) were previously listed under (25a); however, the data in (25), which were taken from the Kuipers corpus, do not indicate secondary stress (or any additional stress).

lexical suffix must be accented: according to the default stress patterns examined earlier in this chapter, the stress pattern in (29) would be the expected result when a root without lexical accents is combined with an accented lexical suffix. However, in (29f), the suffix is combined with a root that is itself accented, namely, /√staqíw/ 'horse'.[17] This being the case, one would expect main stress to fall on the root, and not on the suffix, and the next best alternative would be to show equal stress on both morphemes. The possible stress patterns for a combination with two accented morphemes are listed in (30), where candidates are evaluated in terms of HEAD-MAX, the constraint responsible for ensuring IO faithfulness between prosodic heads. Recall that HEAD-MAX ranks highest among the constraints utilized thus far in the analysis of Squamish stress.

(30) Root=LexS: accented root; accented LexS (assuming it is accented)

+ + µ µ µ s-√taqiw=ulɬ	HEAD-MAX
*☞ a. (staqíw)(úlɬ)	
→ b. (staqiw)(úlɬ)	*!
c. (staqíw)(ulɬ)	*!
d. (stáqiw)(ulɬ)	*!

The tableau in (30) shows that, in terms of HEAD-MAX alone, the best stress result for a concatenation consisting of two accented morphemes is one that allows main stress to surface on both morphemes, just as in the input. While Kuipers' /staqiwúlɬ/ does have two

[17]As already mentioned, /staqíw/ is taken as accented because it fails to adhere to phonologically-determined stress patterns for roots, which favour a penultimate syllable with weight.

prominences in Bar-el and Watt's (2000) version, thus, /√staqìw=úlɬ/, primary stress is on the suffix, and the accented root has only secondary stress.

According to HEAD-MAX, a word consisting of two accented morphemes should surface with two primary stresses as indicated in the input. This is assuming that the two morphemes have equal status, that neither holds any sort of advantage over the other. However, it has been generally observed that cross-linguistically faithfulness to morphological roots is valued over faithfulness to affixes.

The idea that roots are in an elite position in relation to affixes is not new, and, as Alderete (1998) points out, it is well supported by evidence from a variety of sources, including psycholinguistic evidence (gleaned from word recognition studies by, among others, Kempley and Morton 1982; Fowler, Napps, and Feldman 1985) as well as evidence from inventories (see, for instance, McCarthy and Prince 1995; Urbanczyk 1996[2001]; Beckman 1998) and from phonological alternations (McCarthy and Prince 1995; Selkirk 1995). In essence, the evidence suggests that lexical items are stored and accessed in the mental lexicon on the basis of roots rather than affixes, that roots typically condone a wider variety of contrasts than affixes, and that phonological features are more likely to be realized in roots than in affixes.

This concept that roots occupy a position of privilege over that of affixes has been expressed in OT as follows:

(31) Meta-constraint on constraint rankings (McCarthy and Prince 1995)
Root Faith >> Affix Faith

The meta-constraint in (31), which assumes individual constraints for root- and affix-faithfulness, holds that, all things being equal, faithfulness to the root will always be valued over faithfulness to the affix. However, this meta-constraint is no better able than HEAD-MAX to effect the desired outcome for stress in Squamish words with /=ulɬ/: even if it is accented, the lexical suffix would not be expected to bear the word's main stress because ROOTFAITH outranks AFFIXFAITH. This is seen in (32), which again evaluates /staqiwúlɬ/. The tableau in (32) includes two candidates not considered in (30); candidates (32d, e) differ from (30b, c) in that they show secondary as well as primary stress markings. Note that HEAD-MAX is obeyed by any output form that faithfully reflects the fact and location of accent in the input, but does not differentiate between primary and secondary stress. On the other hand, ROOTFAITH >> AFFIXFAITH suggests that, given two prominences, one of which is primary and the other secondary, the primary prominence would land on the root and not on the suffix.

(32) Root=LexS: accented root; accented LexS (assuming it is accented)

+ + μ μ μ s-√taqiw=ulɬ	HEAD-MAX	ROOTFAITH	AFFIXFAITH
*☞ a. (staqíw)(úlɬ)			
b. (staqiw)(úlɬ)	*!	*	
c. (staqíw)(ulɬ)	*!		*
→ d. (staqìw)(úlɬ)		*!	
e. (staqíw)(ùlɬ)			*!

The tableau in (32) shows that adding ROOTFAITH >> AFFIXFAITH to the equation does not alter the results of (30): instead of the actual form (represented by (d), as per Bar-el and Watt 2000), the best candidate is still considered to be candidate (a), which has equal degrees of prominence on both morphemes. Even without candidate (a), the actual form still does not come up as optimal, as ROOTFAITH >> AFFIXFAITH favours (32e), which has main stress on the root rather than on the suffix. Some other solution is clearly required.

Further evidence that a nonstandard approach is called for in accounting for stress in words like /staqiwúlɬ/ comes from observations about the way stress shift functions in the language as a whole. In general, adjacent syllable stress is not permitted in Squamish roots, nor is it found in the majority of morphologically complex words, where multiple stress, when it surfaces, usually falls on alternating syllables.[18] This is evident, for instance, in CV-reduplicated stems (analysed in section 5.2.2 of Chapter 5), where the addition of the CV-reduplicant, which tends to surface with primary stress, has the effect of causing a shift in the stress pattern of the word as a whole. For instance, /ʔíʔimàš/ 'be walking' surfaces with primary stress on the reduplicant and secondary stress on the final syllable of the root, whereas the unreduplicated root (/ʔímaš/) surfaces with primary stress on its initial syllable; to avoid stress clash in the reduplicated stem, /ʔí+ʔímaš/ becomes /ʔíʔimàš/.

[18]Recall from Chapter 4 (section 4.3) that adjacent stress is permitted in certain types of polymorphemic formations when the stressed vowels are separated by two consonants. In contrast, stress does not ordinarily fall on adjacent syllables separated by a single consonant.

In contrast, words like those with /=ulɬ/, listed in (29), do not show any sign of being subject to stress-shift effects. Instead, the location of stress (where it surfaces) in the root portion of the polymorphemic word is exactly the same as it is in the corresponding bare root; for instance, consider /staqìwúlɬ/ 'colt' (cf. /staqíw/ 'horse') and /shùhupìtúlɬ/ 'baby rabbit' (cf. /shúhupit/ 'rabbit') versus /mùsməsúlɬ/ 'calf' (cf. /músməs/ 'cow').[19] In addition to violating ROOTFAITH >> AFFIXFAITH, then, /=ulɬ/-type Root=LexS words are permitted to violate *CLASH, and do so without penalty.[20]

The fact that stress clash, although not permitted in the language in general, is condoned in LexS words like those with /=ulɬ/ argues in favour of a separate stems analysis such as that proposed for these words by Bar-el and Watt (2000). Root and lexical suffix, then, are contained in different prosodic stems, with stress being computed separately for each stem.

Although lexical suffixes in Squamish have not in general been classed with roots (see analyses and discussion in section 6.1), a lexical suffix that occupies a stem other than that occupied by the morphological root must be categorized as such; this follows from the minimal requirement of stems, which is that they contain roots. This argues for the partial prosodic analysis in (33), which is based on /pušúlɬ/ 'kitten'. Recall from the analysis of

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[19]Presumably, forms based on monosyllabic strong roots could also show up with stress on the adjacent syllables of the root and suffix.

[20]It might reasonably be suggested that stress clash is condoned in /staqìwúlɬ/ simply because the root has underlying accent on the final syllable. However, this cannot be the case, since adjacent stress can also show up in combinations with an accentually unmarked root, for instance, in /√shùhupìt=úlɬ/ 'baby rabbit'.

reduplication in Chapter 5 that roots are aligned at the left edge of a prosodic stem by means of ALIGN(RT, ST).

(33) ALIGN(RT, ST), RT=FT&FTBIN-μ >> FTBIN-σ

/√puš=ulɬ/ 'kitten'	ALIGN (RT, ST)	RT=FT& FTBIN-μ	FTBIN -σ
☞ a. [$_{PS}$ [$_{PR}$ (puš)]] [$_{PS}$ [$_{PR}$ (ʔulɬ)]]			**
b. [$_{PS}$ [$_{PR}$ (puš]] [$_{PS}$ [$_{PR}$ ʔulɬ)]]		*!	
c. [$_{PS}$ [$_{PR}$ (puš)] [$_{PR}$ (ʔulɬ)]]	*!		**

In (33), candidates (a, c) violate FTBIN-σ by proposing that each PRoot comprises a foot. The difference between these two candidates is that candidate (c) does not align the left edge of the second PRoot (which contains the lexical suffix) with that of a prosodic stem, and it fails for this reason. Candidate (b), which is alone in obeying FTBIN-σ, is ruled out because it transgresses against the higher-ranking RT=FT&FTBIN-μ. Clearly, the best analysis is one that forms a single foot on each root (the morphological root and the lexical suffix). This constitutes evidence for a dual stem analysis: recall that the best result for the single-stem /p'íčač/ (analysed in 8) was one that enclosed both morphological root and lexical suffix in a single disyllabic foot.

With a prosodic analysis in which the root and lexical suffix are treated as two parts of a compound, as in (33), the resolution of stress (in other words, the decision as to which of the members of the compound gets the main stress) becomes a prime matter for concern. None of the factors considered up to this point (including HEAD-MAX, ROOTFAITH >> AFFIXFAITH, the observation that stress clash is overlooked, and the classification of the lexical suffix as a root) are of help in this quest. Even if the lexical suffix is evaluated as a root instead of as an affix, the best candidate is still one with primary stress in both morphemes (for instance, */púšúlɬ/).

Data like those with /=ulɬ/, then, do not follow the default stress patterns established for Root=LexS concatenations in section 6.1. Some other solution is clearly required, and I propose here to use instead the head-dominance analysis of Revithiadou (1999) to account for the facts.

Revithiadou analyses the way stress patterns in modifier–head structures (like those under discussion in this section) in terms of a theory of head dominance, remarking that "the lexical suffix always hosts primary stress regardless of whether it is unmarked or accented, or it has a weak vowel (i.e. schwa). The accentual properties of roots are irrelevant for stress" (Revithiadou 1999:246).

Adopting Revithiadou's theory in the analysis of stress in Squamish words with /=ulɬ/ affords insight into why this suffix always ends up with primary stress, even in combinations with an accented root: as head of the construction, the lexical suffix dominates the outcome of stress in the word, making moot the usually powerful influence of lexical accent anywhere else in the word. Although the constraint HEAD-MAX is able, in conjunction with phonological constraints, to account for stress in incorporated constructions of the type discussed in section 6.1, the analysis of compound structures requires that additional constraints be invoked. This is because, while HEAD-MAX has dominion over faithfulness to accent where individual morphemes are concerned, it has nothing to say about stress resolution in the prosodic word as a whole.

Revithiadou's (1999) proposal is that, in addition to a constraint enforcing accentual faithfulness in individual morphemes, a constraint she calls FAITH(HEAD), it is necessary to posit separately a constraint that will evaluate accentual faithfulness in the morpheme that heads the compound, namely, her HEADFAITH(HEAD). A ranking HEADFAITH(HEAD) >> FAITH(HEAD) then ensures that faithfulness to accent in the morphosyntactic head of a word takes precedence over faithfulness to accent in individual morphemes. In other words, while faithfulness to the accentual status of individual morphemes is lauded, accentual faithfulness counts for more in the morpheme that is the morphosyntactic head of the word than it does in any other morpheme.

In addition to HEADFAITH(HEAD) >> FAITH(HEAD), Revithiadou utilizes a constraint HEADSTRESS, which ensures that a morphosyntactic head will surface with stress regardless of its accentual status or that of any other morpheme in the word; the implication is that, in a language like Squamish, which has rhythmic word stress, the head morpheme will be the one with *primary* stress. Revithiadou posits the crucial ranking HEADFAITH(HEAD) >> FAITH(HEAD) >> HEADSTRESS, stating that

> Heads are not obligatorily stressed because HEADFAITH dominates HEADSTRESS. This domination hierarchy allows unaccentable morphemes to realize their floating accent outside the morpheme that sponsors them. No other constituent than the head, however, can impose its inherent accent to the word because the ranking HEADSTRESS >> STRUCTURAL guarantees that unmarked heads will be stressed. ... To conclude, in the morphological word we find a situation in which morphosyntactic structure is mapped into prosodic structure and the function that performs the mapping assigns stress to the syntactic head of the word. This is a type of obligatory head dominance: the head has to be stressed even it is not marked with a lexical accent. ... Because HEADSTRESS is in a relatively high ranking, simple faithfulness cannot exercise any power in forming outputs. The ranking hampers accents that belong to constituents other than the head (Revithiadou 1999:286-287).

These constraints are expressed in Revithiadou (1999:5) as follows:

(34) a. HEADFAITH(LA)
A lexical accent sponsored by a morphological head in the input has a correspondent in the output (HEADMAX(LA)).

A lexical accent hosted by a morphological head in the output has a correspondent in the input HEADDEP(LA)).

b. HEADSTRESS
Morphological heads are stressed.

Adding the constraints in (34), which have the highest priority in the constraint rankings, to those already motivated for Squamish permits a satisfactory solution to the problem of stress resolution in words like /staqìwúlɬ/; this is demonstrated by the tableau in (35). For the sake of consistency, I continue to use HEAD-MAX to represent the constraint referred to in Revithiadou (1999) and above as FAITH(HEAD). Note that *CLASH is used in the tableau to represent in general the arsenal of phonological constraints that operate in Squamish (which all rank below HEAD-MAX) because its effect is easily noticeable, for instance, in (35a-b) vs. (35c-d). As the head morpheme, /=ulɬ/ is highlighted in bold in the tableau representations.

(35) HEADSTRESS >> HEAD-MAX >> *CLASH

/s-√taqiw=ulɬ/ 'colt' $_{PS}$[staqíw]$_{PS}$ $_{PS}$[ulɬ]$_{PS}$	HEADFAITH (HEAD)	HEAD STRESS	HEAD -MAX	*CLASH
a. [(taqíw)]=[(**ùlɬ**)]		*!		*
☞ b. [(taqìw)]=[(**úlɬ**)]				*
c. [(táqiw)]=[(**ùlɬ**)]		*!	*	
d. [(tàqiw)]=[(**úlɬ**)]			*!	

In the tableau, candidates (c-d) are unfaithful to the location of the accent in the root, and candidates (a, c) erroneously place primary stress on the (non-head) root rather than on the head morpheme, which is the lexical suffix; these candidates are therefore eliminated as a result of violations to HEADSTRESS, HEAD-MAX, or both. This leaves candidate (b) to win, even though it fails to adhere to *CLASH.

Notice that the constraint HEADFAITH(HEAD) is idle in the analysis in (35); this is because in the absence of evidence to the contrary, the head of the construction (here, the lexical suffix /=ulɬ/), is presumed to be accentually unmarked: although it always appears with primary stress in the data, it is also always in the same semantic relationship with the root.

Clearly, a phonological analysis is irrelevant to the outcome of stress in head–modifier Root=LexS words like /staqìwúlɬ/. The fact that stress can surface on adjacent syllables shows that foot boundaries must coincide with prosodic stem boundaries (as suggested in the discussion following the analysis of /pušúlɬ/ in tableau 33), since a single foot must not contain more than one prominence. Thus, the foot configuration indicated in (35) is the only one that can be seriously considered.

6.2.3. Additional evidence for the modifier–head analysis

The evidence presented thus far for the involvement of semantic factors in the analysis of Root=LexS compounds is not overwhelming, focussing as it does on concatenations, like those with /=ulɬ/, in which the root is always a modifier of the lexical suffix, which is always the head. While it is true that cross-linguistically languages tend to favour either left- or right-headedness in compound words (see, for instance, Selkirk 1982), it is not unusual for a particular language to include some compounds that are not governed by this tendency. Since modifier–head compounds in Squamish tend to be right-headed, and since stress in these right-headed compounds is right-oriented, the existence of left-headed (that is, head–modifier) compounds with left stress orientation would provide further proof of the theory of head stress proposed by Revithiadou and advocated here.

In fact, it is possible to compare the outcomes of stress in compound structures which differ in that one is headed by the root and the other by the lexical suffix. This is illustrated by means of Root=LexS words involving two lexical suffixes found with numerals, namely, /=aɬ/ 'times, instances' and /=mut/ 'separate piece, individual specimen'; exemplary forms with these suffixes are listed in (36a) and (36b), respectively.

(36) a. /=aɬ/ 'times, instances'

√k'ʷin=áɬ	'how often?'
√x̣aʔucn=áɬ	'four times'
√qəx̣=áɬ	'many times, often'

b. /=mut/ 'separate piece, individual specimen'

√k'ʷín=mut	'how many (different ones)?'
√x̣aʔúcn=mut	'four (different pieces)'
√qə́x̣=mut	'many (different ones)'

The data in (36a, b) show that even when affixed to the same root, the lexical suffixes /=aɬ/ and /=mut/ differ with respect to stress in that the former always, and the latter never, bears word stress. However, a close examination of the semantics in the two construction types shows that the two lexical suffixes have different functions. Specifically, unlike the compounds with /=aɬ/, those with /=mut/ require an overt reference to the object being counted, as exemplified, for instance, by /x̣aʔúcnmut scúyayʔ/ ‘four pieces of leather’ (Kuipers 1967:151-152). While the constructions in (36a) are clear instances of a compound modifier–head relation in which the root modifies the lexical suffix, which is head, those in (35b) function in tandem as a modifier of a third component in the sentence, specifically (in the illustrative sentence from Kuipers), /scúyayʔ/. At the same time, the two parts of the Root=LexS compounds in (36b) form a modifier–head type of relation, but a left-headed one rather than the right-headed one of (36a). The corresponding stress differences between the right-headed compounds with /=aɬ/ and the left-headed ones with /=mut/ can be seen in (37) and (38), respectively, where the head in each construction is again highlighted in bold. In the tableaux, the WSP′ and FTFORM=TROCHEE are taken as representative of the series of phonological constraints that are operative in Squamish because they summarize neatly the effect HEADSTRESS has on stress in the word; HEADSTRESS of course outranks all phonological constraints.

(37) /kʷináɬ/ ‘how many times?’

μ μ [$_{PS}$ kʷin] [$_{PS}$ aɬ]	HEADSTRESS	ONSET	WSP′	FTFORM= TROCHEE
a. μμ μ (kʷín)(**aɬ**)	*!	*	*	*
☞ b. μμ μ (kʷin)(**áɬ**)		*	*	*

The stress pattern seen in (37a) is representative of the default established in section 6.1 for Root=LexS concatenations, as it places stress on the root, which is wellformed.

However, the candidate in (37b) wins because it stresses the head morpheme, in adherence to HEADSTRESS.

(38) /qə́x̣mut/ ‘many (different ones)’

μ [PS **qx̣**]=[PS mut]	HEADSTRESS	WSP′	FTFORM= TROCHEE
☞ a. μ (**qə́x̣**)(mut)		*	*
b. μ (**qəx̣**)(mút)	*!		*

According to the default stress pattern, candidate (38b) should be optimal, since it places stress on the only weight-bearing syllable, thereby obeying the WSP′. However, the WSP′ is outmanoeuvred by HEADSTRESS, and candidate (a), which places stress on the head morpheme, wins.

The analysis in this section is concerned with the discussion and analysis of stress in Root=LexS words in which one morpheme, usually the root, modifies the other, which functions as head of the construction. The analysis has shown that, in accordance with Revithiadou’s theory of head stress, the head morpheme in these structures bears the word stress even if this means stressing schwa in the presence of full vowels elsewhere in the word (for instance, in /qə́x̣mut/) and even if the non-head is accented (as in /staqiwúlɬ/). However, in the words examined up to this point, the head morpheme has always been presumed accentually unmarked. Stress in words containing an accented head morpheme would obviously not be expected to differ from the pattern established here. It remains, then, to examine words in which the head morpheme is marked in the lexicon as unaccentable.

6.2.4. Unaccented head morphemes

The words listed in (39) are examples of concatenations combining the unaccented lexical suffix /=wiɬ/ with a variety of roots. Recall from earlier discussion that a suffix is deemed unaccented (unaccentable) if it consistently fails to surface with stress, even when affixed to an obstruent-final schwa-based root, which is ordinarily not stressed in the presence of a full vowel elsewhere in the word. Note that while the forms in (39a) are exemplary of Root=LexS words in a modifier–head relation, those in (39b) exemplify a head–theme relation; the latter are provided here only for comparison purposes, but will be discussed subsequently in section 6.2.5. Head morphemes are highlighted in bold.

(39) Examples of Root=LexS concatenations with /=wiɬ/ 'belly, bowels; container'

a. Stress between morphemes when lexical suffix is head (modifier–head relation)

√tam-ə́=**wiɬ**	'what kind of boat?'
√tay-ə́=**wiɬ**	'race-canoe'
√x̣əyx̣-ə́=**wiɬ**	'war-canoe'
√x̣əp=iʔ-ə́=**wiɬ**[21]	'large wooden platter' (cf. √x̣p=áyʔ 'cedar')

b. Stress on root when root is head (head–theme relation)

√**pí-at**=uɬ	'go hunting in canoe'
√**p'ák'ʷ**=(w)iɬ	'launch a canoe'
√**čáʔ-t**=wiɬ	'build a canoe'
√**ʔə́n**=wiɬ	'be in the centre; man the centre of a boat'

[21] According to Kuipers (1967), this word has an alternative form /x̣əpiʔúɬ/.

An examination of stress in the words in (39a) shows that when the head morpheme of a Root=LexS word in a modifier–head relationship is unaccented, stress does not appear on a morpheme that is a non-head, although such an outcome could logically be expected. In fact, the words listed in (39b) show that this is the outcome for words in which the morphemes are in a head–theme relation instead of a modifier–head one. Although it is incapable of bearing stress, the modified head in (39a) asserts its dominance by refusing to allow stress to fall on the non-head root, instead forcing it onto an epenthetic schwa between the two morphemes.

The important role of faithfulness to lexical accent, especially to lexical accent in the head morpheme in Root=LexS words in a modifier–head relationship, is demonstrated in the analysis of /tayə́wił/ 'race-canoe' in (40). The headedness constraints are here examined in relation to DEP-NUC, which, recall, guards against epenthesis.

(40) HEADFAITH(HEAD) >> HEADSTRESS >> DEP-NUC

– /√tay=wił/ 'race-canoe'	HEADFAITH (HEAD)	HEAD STRESS	HEAD -MAX	DEP-NUC
a. táy ə **wił**		*!		*
☞ b. tay ə́ **wił**				*
c. tay ə **wíł**	*!		*	*
d. tay **wíł**	*!		*	
e. táy **wił**		*!		

In (40), candidates (c, d) are thrown out because they permit stress to surface on the unaccented lexical suffix. Candidates (a, e), which do adhere to HEADFAITH(HEAD), fail on HEADSTRESS, since they place stress on the (non-head) root rather than on the head. The best alternative, then, is to place stress on a neutral element between the two morphemes, as in (40b), even though this violates DEP-NUC.

Note that in order for candidate (40b) to pass both HEADSTRESS and the constraints on accentual faithfulness, the epenthetic material must be linked with the lexical material that follows it (that is, the lexical suffix) rather than with that which precedes it (the root). Schwa is associated with the head morpheme, and for this reason its being assigned stress satisfies HEADSTRESS. Although schwa is associated with the head, it is not part of the head morpheme as such, but rather of the head morpheme's stem. Thus schwa is permitted to bear stress without incurring violations against accentual faithfulness. Whereas the point of reference for HEADFAITH(HEAD) and HEAD-MAX is the individual morpheme, that for HEADSTRESS is the prosodic stem.

These refinements are illustrated in (41), which is a partial reanalysis of (40).

(41) /tayə́wił/ 'race-canoe'

– $[_{PW}$ $[_{PS}$ tay$]_{PS}$ $[_{PS}$ wił$]_{PS}]_{PW}$	HEADFAITH (HEAD)	HEAD STRESS	HEAD -MAX	DEP-NUC
a. [[tay] ə́ [**wił**]]		*!		*
b. [[tayə́] [**wił**]]		*!		*
☞ c. [[tay] [ə́**wił**]]				*
d. [[táy] [**wił**]]		*!		*
e. [[tay] [**wíł**]]	*!		*	*

The analysis in this section has shown that compounds in a modifier–head relationship have stress orientations which favour the morpheme that heads the construction, usually, but not always, the lexical suffix, as exemplified by words with /=ulɬ/. The preference for head stress was further demonstrated by means of a comparison of stress in left-headed and right-headed compounds, using words involving numerals with /=aɬ/ and /=mut/. Finally, an examination of words involving the unaccented lexical suffix /=wiɬ/ illustrated that the dominance of the head is such that when the lexical suffix head cannot bear stress, stress falls on a schwa inserted between the two morphemes, and not on the (non-head) root. It was posited that the epenthetic material is associated with the suffix head rather than with the root, but not actually part of it; this was suggested by the fact that the presence of the stressed schwa was able to satisfy the requirement imposed by HEADSTRESS without violating faithfulness to lexical accent in the head.

Before leaving this section, it seems appropriate to provide some discussion on the somewhat unusual intervention of schwa (apparently solely for stress purposes) between individual morphemes in Root=LexS words like /tayə́wiɬ/. It could conceivably be argued that schwa epenthesis is possible here because the initial consonant of the second morpheme (=wiɬ) is a resonant. However, although there *is* a demonstrated tendency for resonants to surface as syllabic following another consonant (including another resonant), such resonant syllabicity is elsewhere opaque to morpheme boundaries. Importantly, the epenthetic material in this case cannot be strictly interpreted as being due to phonological processes for two reasons: first, a full vowel is available for stress elsewhere in the word (especially, for instance, the accentually unmarked root in /tayə́wiɬ/), and second, another set of data with the same suffix *does* feature root stress (for instance, in /p'ák'ʷ(w)iɬ/ 'launch a canoe' (see data and discussion provided in section 6.2.5).

As already noted, the stress patterns observed in the head-modifying words examined in this section do not follow the default pattern of stress established for Root=LexS in section 6.1. The next section examines Root=LexS words that exhibit a head–theme relation, where stress is more in keeping with the default.

6.2.5. Root as head: head–theme predicate structures

In Root=LexS predicate structures, in which the (nominal) lexical suffix plays a thematic role relative to the (verbal/adjectival) root, it is the root that heads the construction. Noun-incorporating processes, which Czaykowska-Higgins (1996, 1998) and others have claimed structures like this resemble, have been noted in the literature to take place at either the syntactic (see Baker 1988) or at the lexical (see Rosen 1989) level. In contrast to Moses-Columbian, where Root=LexS predicates seemingly result from a syntactic process (see Czaykowska-Higgins 1996, 1998), it has been claimed by Bar-el and Watt (2000) that in Squamish, lexical suffixes are incorporated at the lexical level. This claim is based on evidence from direct object doubling, which, according to Rosen (1989), can result only from a lexical, and not from a syntactic, incorporation process. The evidence provided by Bar-el and Watt (2000:6) for Squamish is presented here in (42); the claim that incorporation in Squamish is lexical derives from the observation that direct object doubling is permitted in the language.

(42) Evidence for lexical incorporation: direct object doubling in Squamish[22]

a.	i. na x̱awtl’=**ach** /na x̣əwƛ’=ač/ AUX broke=hand ‘he broke his hand’		ii. na x̱awtl’=**shen** /na x̣əwƛ’=šən/ AUX broke=foot ‘he broke his foot’
b.	i. na x̱awtl’ ta **naxch** /na x̣əwƛ’ ta naxč/ AUX broke DET hand ‘he broke his hand’		ii. na x̱awtl’ ta **sx̱ents** /na x̣əwƛ’ ta sx̣ənc/ AUX broke DET foot ‘he broke his foot’
c.	i. na x̱awtl’=**ach** ta **naxch** /na x̣əwƛ’=ač ta naxč/ AUX broke=hand DET hand ‘he broke his hand’		ii. na x̱awtl’=**shen** ta **sx̱ents** /na x̣əwƛ’=šən ta sx̣ənc/ AUX broke=foot DET foot ‘he broke his foot’

Bar-el and Watt contend that since lexical suffixes in Root=LexS predicate structures in Squamish are incorporated at the lexical level, these suffixes properly belong in the morphological stem, and consequently in the phonological stem; this is based on an earlier claim by Watt (2000) that

> [a]lthough the distinction between morphological structure and phonological structure has been motivated in the literature (Czaykowska-Higgins 1998, Downing 1999), these domains are completely isomorphic in Sḵwx̱wú7mesh (Watt 2000:6, fn. 9).

The supposition that lexical suffixes in Squamish are incorporated into the stem at the lexical rather than at the syntactic level can be used to account for the default patterns of stress in Root=LexS concatenations in Squamish, discussed in section 6.1. It was argued in that section that stress patterned in these combinations the way it did as a result of an

[22] These data are presented here in the Squamish orthography, as in Bar-el and Watt, because not every example has an exact counterpart in the Kuipers corpus. NAPA transcriptions have been added, and are enclosed in slash brackets. Note that Kuipers (1967) represents ‘foot’ as /sx̣ənʔ/ and ‘hand/arm’ as /nax̣č/.

interaction between phonological factors and lexical accent. In fact, this is the exact combination of factors required to account for stress in Root=LexS concatenations in a head–theme relation, as the following tableaux show. In these cases, then, there is no need to refer additionally to semantic factors, unlike in the modifier–head compound structures discussed in the preceding sections.

To illustrate the difference between the two types of construction in terms of stress, the data sets with the unaccented lexical suffix /=wiɬ/, earlier provided in (39), are repeated here in (43). Specifically, when there is a modifier–head relation between the morphological components of Root=LexS, as in (43a), stress cannot surface on the root, since to do so would violate HEADSTRESS, nor can it surface on the lexical suffix, as this would be in contravention of HEAD-MAX; the only option is to insert epenthetic schwa for stress. In contrast, there is no prohibition against stressing the root in a Root=LexS head–theme relation, and stress is therefore free to surface on the root, as in (43b).

(43) Examples of Root=LexS concatenations with /=wiɬ/ 'belly, bowels; container'

a. Stress between morphemes when lexical suffix is head (modifier–head relation)

√tam-ə́=**wiɬ**	'what kind of boat?'
√tay-ə́=**wiɬ**	'race-canoe'
√x̣əyx̣-ə́=**wiɬ**	'war-canoe'
√x̣əp=iʔ-ə́=**wiɬ**	'large wooden platter' (cf. √x̣p=áyʔ 'cedar')

b. Stress on root when root is head (head–theme relation)

√**pí-at**=uɬ	'go hunting in canoe'
√**p'ák'**^{w}=(w)iɬ	'launch a canoe'
√**čáʔ-t**=wiɬ	'build a canoe'
√**ʔə́n**=wiɬ	'be in the centre; man the centre of a boat'

An analysis was provided in the previous section for forms like those in (43a); see the tableaux in (40-41) and the surrounding discussion.

The tableau in (44) provides an analysis of stress in the head–theme Root=LexS compound /ʔə́n=wiɬ/ 'be in the centre; man the centre of a boat'. Since the individual components of head–theme compounds occupy a single stem, unlike their modifier–head counterparts, their analysis reverts to the default patterns discussed in section 6.1.

(44) /ʔə́nwiɬ/ 'man the centre of boat'

– μ √ʔən=wiɬ	HEAD-MAX	RT=FT&FTBIN-μ	WBYP	FTBIN-σ	FTFORM=TROCHEE	*μ/R
a. μ (**ʔə́n**)(wiɬ)			**!	**	*	
b. μ μ (**ʔə́n**)(wiɬ)			*	**!	*	*
c. μ (**ʔən**)(wíɬ)	*!		**	**	*	
d. μ (**ʔən**wíɬ)	*!	*	**	*	*	
e. μ (**ʔə́n**wiɬ)		*!	**	*		
☞ f. μ μ (**ʔə́n**wiɬ)			*	*		*

The tableau shows that the best analysis of a disyllabic head–theme Root=LexS word involving an inherently unaccented lexical suffix is one that encloses the entire word in a disyllabic moraic trochee (44f), and at the same time is faithful to the accentual status of the (unaccented) lexical suffix. Unlike stress in modifier–head compounds, which could be determined solely on the basis of morphological factors relating to accent and headedness, a complete analysis of stress in head–theme compounds requires a joint effort between morphological and phonological factors.

In contrast to Root=LexS compounds in a modifier–head relation, headedness plays no role in the assignment of stress in head–theme compounds. In fact, its inclusion among the constraints evaluating head–theme compounds leads to the wrong conclusion, as the tableau in (45), which features a partial reanalysis of the head–theme compound /√c'əhús/ 'get hit in the face' (see earlier analysis in tableau 14), shows.

(45) /c'əhús/ 'get hit in the face'

μ √c'əh=us	HEAD STRESS	DEP-NUC	FTFORM=TROCHEE
→ a. (**c'ə.h**ús)	*!	*	*
*☞ b. (**c'ə́.h**us)		*	

In head–theme incorporated forms, the root is always head,[23] and as such is presumed to constitute the preferred site for stress. However, because phonological rules hold sway within the stem, stress falls on the suffix, which has a full vowel, rather than on the obstruent-final schwa-based root. In essence, then, because both morphemes belong to the same stress domain, they are not in competition for stress. The same is not true of modifier–head compounds, where the head of the construction gets the stress without

[23]"[In incorporated forms consisting of a root and a lexical suffix] the function that maps morphological structure into prosodic structure assigns prominence to the root, which is the constituent into which the lexical suffix incorporates and consequently, is the head of the construction" (Revithiadou 1999:230).

regard to what phonological rules have to say about stress in its individual parts. Word stress in this case is not governed by phonological considerations, but entirely by morphological ones, and the relationship between the constituents is everything.

This section examined stress in Root=LexS concatenations in which the lexical suffix played a thematic role relative to the predicative root, which headed the construction. This is a frequent role for somatic suffixes, where the body part represented by a particular suffix is the target of some action of the root, which has verbal/adjectival meaning. The root and suffix were posited as residing in the same phonological (as well as morphological) stem, and consequently the stress results were generally predictable in terms of the size, shape, and alignment of feet, except when the root contained no full vowel or when the occasional presence of lexical accent in one of the morphemes required that a constraint on accentual faithfulness be brought into play.

6.2.6. Discussion and conclusions

In the preceding sections I discussed and illustrated the similarities and dissimilarities in stress outcomes of Root=LexS words. I argued, first of all, that, as in Moses-Columbian, Root=LexS words are compound-like and form one of two distinctly different types of compound structures: (i) a modifier–head compound structure, in which one morpheme, usually the root, modifies the other, usually the lexical suffix, and (ii) a head–theme predicate structure, in which the lexical suffix has a thematic role relative to the root, which always heads the construction. Following Bar-el and Watt (2000), I argued that, unlike in Moses-Columbian, where head–theme, or incorporated-noun compounds, are found in the morphosyntax, both head–theme and modifier–head compounds are lexical in Squamish.

I have demonstrated in these sections that the two types of Root=LexS compounds described here occupy different prosodic stems, as indicated by the (partial) schema in (46).

(46) Phonological domain for lexical suffixation in Squamish
Phonological domain
$[_{PS}\ \sqrt{}\text{ROOT} = \text{LS}_{inc}]_{PS}\ [_{PS} = \text{LS}_{cmp}]_{PS}$

The evidence for this position comes mainly from two observations about the different ways in which stress behaves in these compound types. First, while a blend of phonological factors and factors pertaining to lexical accent are highly successful in predicting the occurrence of stress in head–theme compounds (for instance, in /qəx̣=ús/ and /cə́xʷ=iʔəqʷ/ 'get hit on the head', where schwa in the second example gets stressed only because the lexical suffix with which it is combined is unaccented), the same combination of factors has no power of prediction in modifier–head compounds. Second, while stress shift commonly occurs in head–theme compounds as a strategy to prevent stress from surfacing on adjacent syllables (for instance, compare the stress configuration in the reduplicated stem /ʔíʔimàš/ 'be walking' with that in its root morpheme, /ʔímaš/), such a strategy is not employed in modifier–head compounds, where stress clash is a fairly common occurrence (for instance, in /staqìwúlɬ/ 'colt' and /shùhupìtúlɬ/ 'baby rabbit').

Finally, I have shown that head–theme compounds differ from modifier–head compounds in that the latter, but not the former, exhibit stress patterns that refer to the head of the structure in order to determine the outcome of stress. In head–theme compounds, the root is always head, but it really does not matter, as stress is determined on the basis of the phonology and lexical accent. Modifier–head compounds, on the other hand, tend to stress the head, ignoring the phonology and lexical accent; if for some reason stress cannot occur on the head (as, for instance, when it is unaccented), it will fall on a between-morphemes epenthetic schwa in preference to falling on the non-head morpheme (for instance, in /tayə́wiɬ/ ‘race-canoe’).

The tableaux and discussion in these sections have shown that applying the constraints and rankings proposed in Revithiadou’s (1999) theory of head stress and head dominance to the analysis of stress in Squamish words containing lexical suffixes allows for a coherent and comprehensive account of stress in such words. In this account, lexical suffixes are not pre-assigned to a particular stem, nor are they designated as inherently weak or strong (as posited in Bar-el and Watt 2000), since a particular lexical suffix may be incorporated into the root (“weak” structure) in one context but may form a compound with the root (“strong” structure) in another. The differential effect this has on stress has been demonstrated with a variety of lexical suffixes in both contexts.

Having said this, it must be noted that exceptions do exist, as attested to by the data listed in (47).

(47) a. c’áq^{w}iʔəq^{w} ‘bald’ (=iʔəq^{w} ‘top of head’)
qíx̣us ‘blind’ (=us ‘face’)

b. x̣ə́wƛ’iwas ‘paddle, oar’ (x̣əwƛ’ ‘be broken’; =iwas, was, us ‘stick’)
šíč’us ‘harpoon for killing seals’ (šič’ ‘be all around’)
q’^{w}íq’^{w}lwas ‘stick for holding salmon over the fire’ (q’^{w}əl ‘cooked’; sq’^{w}əlm ‘roast salmon’)

It will be noted that the list of exceptions in (47) does not include Root=LexS words that are clearly predicative in nature: in fact, head–theme predicate structures are very consistently analysable in terms of the interaction between phonological factors and lexical accent (if present) described above.

In contrast, the exact nature of the relationship between constituents in a non-predicative structure is frequently difficult to pin down. As well, the process of forming Root=LexS words with non-predicative meaning appears in general to be less than productive, and many of the words that look like modifier–head compounds are lexicalized in that, while the lexical suffix may be identifiable in other words as well, the root, if found elsewhere at all, tends to be found in specialized, non-independent, contexts. For instance, the root morpheme in /√c'áq=iʔeqʷ/ 'bald' (=iʔəqʷ 'top of head') appears only in this context[24] and never occurs as a free morpheme; in a true modifier–head compound, one would expect stress to surface on an epenthetic schwa between the two morphemes rather than on the (non-head) root, as the suffix is unaccented (recall that suffixes are considered unaccentable if they never surface with primary stress, even with a schwa-based root, which ordinarily is not stressed when there is a full vowel elsewhere in the word (but see Chapter 4). Similarly, the root in /√qíx̣=us/ 'blind' (=us 'face') does not stand alone and is not found in other contexts[25]; the expected stress result if a modifier–head compound would be /qix̣ús/, given that the suffix is without lexical accent.

The combinations in (47b) again show quite specialized uses, but with the difference that the root involved in each case is also freestanding. In addition, at least in the case of

[24] This is assuming there is no relation between /c'áqiʔeqʷ/ 'bald' and /c'áqšləqʷ/ 'black cod'.

[25] A connection with /√qix̣/ 'swerve, sway' is, in Kuipers' words, "semantically difficult" (Kuipers 1967:354).

/q’ʷíq’ʷlwas/ the particular concatenation of morphemes themselves (that is, not just the English gloss) seems to indicate a modifier–head relation; again, if this were the case, stress would be expected to fall on the lexical suffix. It is apparently not the case that the lexical suffix involved (/=iwas/ ‘stick’) is unaccented, since alongside /x̣ə́wƛ’iwas/ ‘paddle, oar’ exists the phonologically identical head–theme predicate compound /x̣əwƛ’íʔwas/ ‘(have a) broken paddle’; note that stress under the latter interpretation is entirely predictable on the basis of phonological factors. In contrast to /x̣ə́wƛ’iwas/ ‘paddle, oar’, final stress in /putíwʔas/ ‘oar’ (√put ‘boat’) is predictable under the analysis advocated here for modifier–head compounds. Note that while the latter word for ‘oar’ is completely transparent as a modifier–head compound, the former is not: in strictly lexical terms, its gloss is, in fact, exactly identical to the word meaning ‘have a broken paddle’ (that is, both gloss as √be broken=stick).

The problem /x̣ə́wƛ’iwas/ ‘paddle, oar’ presents for the analysis in general (and for a Revithiadou-style analysis in particular) is that it does not fit the stress pattern proposed for either modifier–head or head–theme concatenations with lexical suffixes, as under both analyses the lexical suffix would be expected to carry the stress: under a modifier–head analysis, because the lexical suffix, as (presumed) head of the construction, commandeers stress; and under a head–theme analysis, because the phonologically determined outcome of stress in this type of compound rules out the possibility of stressing schwa in the presence of full vowels elsewhere in the word. Instead, stress on the schwa-based root follows the expected pattern for a head–modifier compound headed by the root; however, neither the gloss nor the actual meaning indicate such an interpretation.

In summary, then, while stress in Root=LexS words in a head–theme relation can be straightforwardly explained by Revithiadou's hypothesis for stress in Salishan languages, those that do not fit this description cannot. The particular use to which individual lexical suffixes are put appears in general to be specialized; for instance, as mentioned in section 6.2.3, those referring to body parts are found predominantly in head–theme relations, while others (like /=ulɬ/ 'young specimen') are found strictly in modifier–head relations, as pointed out in section 6.2.4. It stands to reason that nonstandard uses would be less productive and, as such, more likely to be lexicalized. Regarding the productivity of lexical suffixes, Kuipers (1967:118) remarks, referring specifically to body-part suffixes, that while these suffixes "are found in nominal as well as verbal complexes", only the latter are productive.

Chapter 7

Stress in polymorphemic words involving grammatical suffixation

7.0. Introduction

The analysis of stress in both non-reduplicative and reduplicative prefixed forms in Chapter 5, as well as that in words involving lexical suffixation in Chapter 6, provided evidence for the existence in Squamish of prosodic domains at the levels of PRoot, PStem, and PWord. In what follows, I provide additional motivation for all three domains through an examination of stress patterns in words involving grammatical suffixes. Specifically, I argue that, like incorporating lexical suffixes, grammatical suffixes such as the /-at/ control transitive and the /-iʔ/ inchoative share a PStem with the morphological root, and that, like compound lexical suffixes, grammatical suffixes such as the causative reflexive /-namʔut/ occupy a PRoot position located in an additional PStem within the PWord. However, the majority of grammatical suffixes (for instance, the /-an/ transitive) are not only external to the PStem, but also to the PWord, while still occupying a position within the PPhrase. This indicates the schema in (1).

(1) Phonological domain for grammatical suffixation in Squamish

$[_{PP}\ [_{PW}\ [_{PS}\ [_{PR}\ \sqrt{}\text{Root}]_{PR}\ \textit{-at, -iʔ}]_{PS}\ [_{PS}\ [_{PR}\ \textit{-namʔut}]_{PR}\ ]_{PS}\ ]_{PW}\ \textit{-an}]_{PP}$

Recall from the discussion of Root=LexS words that stress in the PStem is determined on the basis of phonological and morphological considerations, including, but not limited to, vowel quality, moraic weight, and lexical accent: the root bears stress if it contains weight unless superceded by lexical accent in an affix (for instance, compare and contrast the manifestation of stress in /√cíq=ayus/ 'get stabbed in the eye' and /√t'x̣=áyus/ 'make lightning', where neither morpheme contains lexical accent and where vocalic quality in the root clearly makes a difference, vs. /√caq=áyaʔn/ 'have one's ear bleeding', in which the suffix is accented; and /s-√qʷəh=áyaʔn/ 'hole through the ear', which again has an accented lexical suffix, vs. /n-√cáq=iʔəqʷ/ 'bald' and /√cə́xʷ=iʔəqʷ/ 'get hit on the head', in which the lexical suffix is inherently unaccented).

At the PWord level, the computation of stress is a matter of evaluating competing PStems in terms of interacting morphological and morphosyntactic factors: the stem that contains the functional head of the construction bears primary word stress except when it is inherently unaccented, in which case stress falls on a between–morphemes epenthetic schwa rather than surfacing on a non-head morpheme (for instance, compare and contrast stress in /√p'ák'ʷ=wiɬ/ 'launch a canoe' and /ʔə́n=wiɬ/ 'man the centre of a boat', which involve incorporating constructions headed by the root, vs. /tay-ə́=wiɬ/ 'race-canoe' and /√x̣əyx̣-ə́=wiɬ/ 'war-canoe', which are compound structures headed by the suffix; recall that /=wiɬ/ is an inherently unaccented suffix). At this level, the outcome of stress is dependent on morphosyntactic factors, including lexical accent in the individual morphemes involved and headedness in the word as a whole.

In contrast to both PStem and PWord level operations, the outcome of stress in the PPhrase is based solely on phonological considerations: ordinarily, primary stress will surface exactly as determined at the PWord level, with the possibility of additional stress being assigned according to a pattern of alternating syllable stress (for instance, compare /t-q'á+√q'an-ácut/ (< -at-sut) 'be returning the way one has come' and /q'an+√q'án-acut/ 'walk back and forth'[1]). In the event that the PWord contains no weight, main stress will tend to surface on a suffix that is situated outside the PWord, provided that that suffix both (a) contains a full vowel and (b) is eligible for stress under principles governing alternating stress (compare /√qʷa-númut/ (< √qʷəh) 'escape' vs. /√tə́l-numut/ 'to realize s.t.' and /√kʷə́laš-numut/ 'shoot oneself accidentally').

Evidence for PStem-level grammatical suffixation comes in part from the observation that stress in Root-*at* and in Root-*iʔ* concatenations is assigned on the same basis as is that in single-stem Root=LexS combinations (analysed in Chapter 6, section 6.1), in that stress falls on the root if it contains a full vowel or a schwa–resonant sequence, but otherwise on a full vowel in the suffix. Note that schwa-based suffixes never bear primary word stress if a full vowel is present in the root, and that grammatical suffixes in the main do not have morphological accent.

Significantly, while stress in morphological concatenations involving the /-at/ and /-iʔ/ suffixes is determined on the basis of phonological factors centring around the general unstressability of schwa when followed by an obstruent, the ability of stress to surface on a PPhrase grammatical suffix (like the /-an/ control transitive), is strictly controlled in that the suffix's syllable if not an even number of syllables to the right of main PWord stress

[1]Recall that transcriptions in the Kuipers corpora do not differentiate between primary and secondary stress, and that only primary stress surfaces obligatorily in a word.

(the comparative examples cited earlier were /t-q’á+√q’an-ácut/ ‘be returning the way one has come’ and /q’an+√q’án-acut/ ‘walk back and forth’), then nevertheless in a different foot (for instance, in /√x̣íc=q-an/ ‘to fell (a tree)’). If in a legitimate position for stress, the suffix may bear the main word stress (leaving an optional secondary stress in the PWord), but is consistent in doing so only in cases where the primary stress would otherwise fall on a schwa.

That /-namʔut/ is a PRoot suffix in the second of two juxtaposed PStems is suggested by the fact that in combinations that include this suffix, stress patterns exactly as it does in modifier–head Root=LexS words (see Chapter 6, section 6.2.2). Recall that stress in these dual-stem compound-type structures is assigned on the basis of morphosyntactic headedness at the PWord level, where phonological factors and lexical accent, so important in PStem stress analysis, are generally ignored.

The domains analysis advocated here for grammatical suffixation in particular, is indicated in part by the observation that widely differing stress behaviours are found in concatenations with different suffixes belonging to the same suffix class, for instance, the /-an, -at/ control transitives. Although such stress differences will be discussed at length in the following sections, the examples listed in (2) will serve as a preliminary illustration of the diverse ways in which stress manifests itself in words containing these suffixes.

(2) Root + control transitive

a. /-an/

i.	√cáy-n	‘follow, chase’	√ɬút’-un	‘sip (a fluid)’
ii.	√ɬə́m-n	‘pick berries’	√kʷə́l-n	‘warm near fire’
iii.	√pə́c-n	‘bend, fold’	√cə́xʷ-n	‘throw at’

b. /-at/

i.	pál-t	‘skim off’	kʷáš-at	‘be cut’
ii.	pə́n-t	‘bury’	q’ʷə́l-t	‘cook’
iii.	cx̣-ə́t	‘push’	ƛ’xʷ-ə́t	‘win, master’

The examples in (2) show that while in concatenations with the /-an/ suffix stress always surfaces on the root, even when the root is schwa-based, as in (2a.ii-iii), in concatenations with the /-at/ suffix stress surfaces on the root only when the root contains weight in the form of a full vowel, illustrated by the examples in (2b.i), or a post-schwa resonant, as in (2b.ii). The fact that these (functionally similar) suffixes behave in such different ways in terms of stress gives a strong indication that a head-dominant analysis of grammatical suffixes, like that proposed in Revithiadou (1999; see discussion in Chapter 6, section 6.2.1), is not adequate to account for stress in Squamish inflected forms. If headedness were what mattered, grammatical suffixes would be expected to dictate stress in words containing them in the same way as did lexical suffixes in Root=LexS words showing a modifier–head relation (in Chapter 6, section 6.2.2). That is, a stressable grammatical suffix should surface with primary stress in the word simply because it is head of its construction; at the same time, an unstressable grammatical suffix would be expected to surface with stress on an epenthetic schwa superimposed between the two morphemes (for instance, see analysis of /tayə́wiɬ/ ‘race-canoe’ in Chapter 6, section 6.2.4). In fact, however, Squamish has only one grammatical suffix, namely, the reflexive /-namʔut/, for which this analysis can be said to work unequivocally, and similarly to the case of control transitives, other forms of the reflexive exist which do not assign stress in this way (for instance, compare /k’ʷak’ʷčstə́namʔut/ ‘look at oneself’, which has stress on epenthetic schwa between the causative stem and the suffix, with /k’ʷáčusnumut/ ‘see one’s own face’ and /qʷanúmut/ (< √qʷəh/) ‘escape, get (oneself) through’, where stress is phonologically determined, as shown by the fact that stress falls on the first full vowel in the suffix and not on the schwa-based root).

A theory of head stress, then, can clearly not be used to account for stress in Squamish words involving grammatical suffixes, and I argue in the following sections that domain distinctions and not headedness are primarily responsible for the way stress falls in inflected words.

Grammatical suffixes in Squamish fall into three main categories: personal suffixes, primary suffixes (for instance, the inchoative), and verbalizing (generally, transitive and intransitive) suffixes. In addition, Squamish has a limited number of suffixes which add modal and adverbial meaning (for instance, /-ka/, used to express the imperative, /-č’/ ‘apparently’, and /-xʷ/ ‘still, yet’), and which can be attached to clitics as well as to content words. However, for the most part, aspectual, temporal, modal, and other predicative meaning in Squamish is conveyed by means of clitics.[2]

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[2] A list of clitics used in Squamish is included in Appendix B.

7.1. Stress in /-at/ vs. /-an/ control transitives: a basis for domains analysis

Squamish has four main transitive markers.[3] Of these, the causative /-s/ suffix and the non-volitional /-nəxʷ/ have no effect on word stress at all, and are, in fact, unstressable, /-s/ because it is vowelless, and /-nəxʷ/ because it is schwa-based. In contrast, the /-at/ and /-an/ suffixes, which add volitional transitive meaning, do affect stress, but in markedly different ways, as was suggested in the preceding section, and as subsequent discussion will show.

While Kuipers' (1967) portrays the control transitives as /-(V)t, -(V)n/, I assume them to be complexes consisting of a control element /-a-/ and the transitive /-t, -n/ suffixes.[4] In claiming the control-designating element to be a separate morpheme, I follow analyses of a similar element in other Salishan languages, for instance, in Thompson (see Thompson 1976, 1985) and Upper Chehalis (see Rowicka 2001). That such a control affix in Squamish must be taken as underlyingly /-a-/ is suggested by the fact that this is the form it usually takes under stress (for instance, compare the suffix's vowel in /č'ít-n/ 'bring close' and

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[3]In addition, Squamish has three oblique-marking suffixes, referred to by Kuipers (1967) as complex transitivizers, since their specification includes the /-t, -n/ transitive suffix. Regarding the use of these "petrified complexes", Kuipers states that

> /-šit/ [e.g., in *x̣ə́lʔšit* 'write for (someone)'] refers to the destinee of the action (do for, give to, take from; in all my examples the destinee is human); /-nit/ [e.g., in *ʔlʔə́linit* 'dream about'] refers to an object that is not the destinee of the action but bears some other relation to it; /-minʔ/ [e.g., in *qxʷúsminʔ* 'gang up on someone; tr.'] was recorded with three stems only, and with one of these it is a less usual alternative of /-nit/ (Kuipers 1967:78).

As the obliques neither bear stress nor affect word stress in any way, they will not be discussed further here.

[4]Demers and Horn (1978) took the transitive suffix as underlyingly /-an/.

/ɬík'ʷ-in/ 'hang, hook up', where stress is on the root, with that in /mik'ʷšn-ánʔ/ 'wash s.o.'s feet', which has stress on the suffix), although elsewhere it surfaces, if at all, as an echo of the vowel in the root to which it is affixed. In fact, with the /-n/ transitive, the form of the control suffix under stress is always [a]; this is not necessarily the case with the /-t/ transitive, where stress tends to be on the suffix only in combinations with schwa-based roots, in which case the control suffix takes the form [ə] in harmony with the vowel in the root (for instance, in /cx̣ə́t/ 'push'). As we will see, this fundamental difference in the surface form taken by the control morpheme adds to the evidence in favour of a differential analysis of the /-an/ and /-at/ transitives in terms of prosodic domains.

In the stance adopted here *vis a vis* the control morpheme, I veer from an earlier analysis (in Dyck 1998) in which I took the view that a control transitive constituted a single morpheme consisting of the final consonants /-t, -n/ preceded by an associated empty vowel slot. A similar position was taken by Urbanczyk (1999) in a paper on echo vowels in Coast Salishan. Riepl (2000), on the other hand, posits for (non-Coast) Upper Chehalis that the vowel slot associated with the transitive must be fully specified, as I do here for Squamish. I differ from him in my view of the control transitives as complex morphemes consisting of a control element and a transitive suffix, although this is not important to the analysis here. For this reason, I refer to them henceforth as /-at, -an/.

7.1.1. The /-at/ control transitive: a GrS in the PStem domain

Examples of words combining a root with the /-at/ control transitive are listed in (3). The suffixed forms in (3a-c) are based on monosyllabic roots containing a full vowel (3a), a schwa–resonant sequence (3b), and a schwa–obstruent sequence (3c), respectively, while transitive forms built on disyllabic roots are listed in (3d).

(3) Root + control transitive /-at/

a. Full-vowel roots: stress on root

pál-t	‘skim off’	c’áyx̣-t	‘rush’
čáw-at	‘help’	k^{w}áš-at	‘be cut’
líx^{w}-t	‘put down’	sín-it	‘move’
cíx^{w}-it	‘reach’	łít’-it	‘spend gifts, distribute’
šúk’^{w}-ut	‘bathe’	q’^{w}úy-ut	‘beat’

b. Schwa-based roots with resonant as C_2: stress on root

pə́n-t	‘bury’	čə́nʔ-t	‘to support, steady’
q’^{w}ə́l-t	‘cook’	tə́lʔ-t	‘know’
q^{w}ə́h-t, q^{w}á-t	‘save, rescue’	č’ə́mʔ-t	‘bite’
yə́w-t	‘to praise’	tə́lq-t	‘answer’
hə́yq^{w}-t	‘propose, suggest (to do s.t. together)’		

c. Schwa-based roots with obstruent as C_2: stress on suffix

cx̣-ə́t	‘push’	ƛ’x^{w}-ə́t	‘win, master’
q^{w}č-ə́t	‘spit (blood)’	q’^{w}š-ə́t	‘play with (s.o. or s.t.)’
t’q-ə́t	‘insult’	qp’-ə́t	‘close’

d. Disyllabic roots: stress on root

k^{w}ə́laš-t	‘shoot’	ʔə́x^{w}aʔ-t	‘give’
ʔína-t	‘say what?’	ʔámʔəq’-t	‘deliver’

The data in (3) show that when the /-at/ control transitive is added to either a root with a full vowel, as in (3a), or one containing a post-schwa resonant, as in (3b), stress is on the root; in contrast, when the root is schwa-based and C_2 is an obstruent, as in (3c), stress is on the suffix. For roots with full vowels and for obstruent-final schwa-based roots, these patterns exactly mimic the stress patterns found in similarly shaped head–theme Root=LexS words, examined in Chapter 6 (sections 6.1 and 6.2.5). As well, the stress patterns seen in

(3b), in which the schwa-based root has a post-schwa resonant, are reminiscent of patterns seen in approximately half of similarly shaped Root=LexS words (recall that there was some confusion as to whether stress in these words should be left- or right-oriented, a confusion which is not carried over to /-at/ control transitives, where stress is consistently on the schwa-based root if it has a post-schwa resonant). Therefore, the stress outcomes exhibited by the inflected forms in (3) can be derived in the same way as were the lexically suffixed forms.

The tableau in (4) provides an analyses of /k^wášat/ 'be cut', a transitive formed on a monosyllabic root containing a full vowel. The constraints and constraint rankings utilized in (4) have all been previously established (in earlier chapters). ONSET and the WSP′ are excluded from the tableau: each of the listed candidates obeys the former, and incurs a single violation against the latter.

(4) /k^wášat/ 'be cut'

μ μ √k^waš-at	*μ/K	RT=FT& FTBIN-μ	ALIGN L-WD	ALIGN R-WD	WBYP	FTBIN -σ	FTFORM= TROCHEE	PARSE -σ
a. μ μ (k^wá)(šat)		*!			*	**	*	
☞ b. μ μ (k^wá.šat)					*			
c. μ μ (k^wa.šát)					*		*!	
d. μ μ (k^wá)šat		*!		*	*	*		*
e. μ μμ k^wa(šát)	*!		*			*		*

In (4), candidate (e), which assigns a mora to an obstruent in coda position, is ruled out early. Candidates (a, d) are eliminated due to violations against RT=FT&FTBIN-μ; both candidates also violate FTBIN-σ. The remaining candidates all feature a single disyllabic foot formed on the complex word; of these, candidate (b) is considered the better candidate because it obeys FTFORM=TROCHEE, whereas (c) does violates it.

Although the analysis in (4) is able to produce the correct results for the transitive form in question, which is based on a root with the full vowel /a/, it would not be able to do so if the root contained a vowel other than /a/ (for instance, the analysis of /√šuk'^{w}-at/ 'bathe' would produce */šúk'^{w}at/, and not /šúk'^{w}ut/, as the optimal form). This is because the vowel of the control suffix undergoes a process of harmonizing to that in the root.

Vowel harmony in Squamish can be achieved by means of the constraints in (5-6), which rule on featural identity between the input and output vowel on the one hand, and between the root vowel and that contained in the control suffix on the other hand. Note that the constraint in (6) must specify exactly which morphemes are affected: vowel harmony in Squamish is limited to these morphemes.[5] As well, vowel harmony is confined to the prosodic foot (compare /-an/ transitive forms /ɬútun/ 'to sip (a fluid)' vs. /x̣icqán/ 'to fell (a tree)'[6]), as pointed out in Urbanczyk's (1999) examination of echo vowels in a number

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[5]Vowel harmony is also seen in diminutive reduplication, no longer a productive process (Bar-el 2000). For instance, Kuipers (1967) lists the diminutive form of /latám/ 'table' as /lílitam/, in which the root's leftmost vowel is an echo of the vowel in the diminutive reduplicant, which is always /i/.

[6]Examples are pulled from /-an/ transitivization because there is insufficient evidence from /-at/ transitives that vowel harmony is delimited by foot boundaries: by far the majority of /-at/ transitive forms listed in the Kuipers corpora involve CVC roots; however, the few

of Salishan languages, including Squamish.[7] This prosodic restriction must also be stipulated in the constraint.

(5) IO-IDENT
Ident[VF]-IO: Corresponding vowels in the input and output must have identical place features.

(6) RTSFX-IDENT[8]
Ident[VF]-RtSfx: Corresponding vowels in the *root* and *control suffix* must have identical place features if contained within a single prosodic foot.

Given an input /√šuk'ʷ-at/, which has dissimilar vowels in the root and the suffix, the function of IO-IDENT is to ensure that each vowel will retain the same features in the output form as it had in the input form; thus, the expected result would be */šuk'ʷat/. In contrast, the purpose of RTSFX-IDENT is to ensure that the vowel in the root and that in the suffix are identical within the same foot; here the expected outcome is either /šuk'ʷut/ or */šak'ʷat/. Since the actual output has matching vowels in the root and suffix, and in this way shows

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examples involving disyllabic roots or stems tend to surface without the suffix vowel (e.g., /kʷə́lašt/ 'to shoot; tr.). In contrast, the evidence from /-an/ transitives is extensive. (Proof that the suffix and root vowels in CVCC-*an* words are situated in different feet is proffered in the next section; see also discussion in Chapter 4, section 4.3.)

[7]Demers and Horn (1978) claim that the /-an/ suffix undergoes vowel harmony if it is unstressed.

[8]Shaw (p.c.) points out that, as formulated, the faithfulness constraint in (6) is defined as holding between corresponding segments within the same output string, whereas standard correspondence constraints generally hold between different levels (for instance, between Input-Output, Output-Output, or Reduplicant-Base). However, constraints calling for correspondence between segments in the output of a word have been previously employed, for instance, by Walker (2000), who utilizes a notion of "intersegmental correspondence" to explain long-distance voicing agreement effects between consonants in the Niger-Congo language of Ngbaka as well as in the Chadic language of Kera.

a disregard for IO faithfulness to features for one of the vowels, it is clear that a ranking RTSFX-IDENT >> IO-IDENT obtains between these two constraints. The fact that it is the root vowel that remains constant and the suffix vowel that undergoes harmony can be explained in terms of the meta-constraint ROOTFAITH >> AFFIXFAITH, discussed in Chapter 6 (see section 6.2). Accurately reflecting the preference for IO identity in the root's vowel over that in the suffix requires that the IO-IDENT constraint in (5) be restated as (7-8).

(7) IO-IDENT(ROOT)
Ident[VF]-IO(Root): Corresponding vowels in the input and output forms of a root morpheme must have identical place features.

(8) IO-IDENT(AFFIX)
Ident[VF]-IO(Affix): Corresponding vowels in the input and output forms of an affix must have identical place features.

The interaction of the faithfulness constraints proposed in (6-8) is illustrated in (9). The tableau shows that the ranking RTSFX-IDENT >> IO-IDENT(ROOT) >> IO-IDENT(AFFIX) must obtain in order to ensure the correct outcome. The placement of these constraints relative to other constraints in the language is not certain at this point.

(9) RTSFX-IDENT >> IO-IDENT(ROOT) >> IO-IDENT(AFFIX)

/√šuk'ʷ-at/ 'bathe'	RTSFX -IDENT	IO-IDENT (ROOT)	IO-IDENT (AFFIX)
a. (šuk'ʷat)	*!		
☞ b. (šuk'ʷut)			*
c. (sak'ʷat)		*!	

In (9), candidate (a), which is an exact copy of the input form, is eliminated because it does not have matching vowels in the root and suffix. Each of the remaining candidates is in adherence with exactly one of IO-IDENT(ROOT) and IO-IDENT(AFFIX), and candidate (b) wins because, unlike (c), it is faithful to the root's vowel.

The tableaux in (10-11) analyse stress in /-at/ transitives based on monosyllabic roots with schwa. The analyses show similar results to those found with Root=LexS words, since stress falls on the root when it contains a post-schwa resonant, as in (11), but on the suffix when the post-schwa consonant in the root is an obstruent (10). Recall that this differential stress outcome is due to fundamental differences in the way tautomorphemic nonfinal CR and CK sequences are parsed into syllables, in that a resonant is parsed as coda to the same syllable as that occupied by the preceding consonant (which is onset), while an obstruent is parsed as onset to the following syllable. In the case of the resonant, a (CəR.VC) foot structure is condoned by the constraint ranking CODA-R >> ONSET; however, in the case of the obstruent, the parsing (Cə.KVC) is enforced: where CODA-R does not apply, ONSET is undominated.

The analysis in (10) is of the transitive form /cx̣ə́t/, which features the obstruent-final schwa-based root /cəx̣/. Only candidates that pass the high-ranking ONSET constraint are considered in (10); this constraint is therefore omitted in the tableau, along with ALIGNL-WD and ALIGNR-WD, which all listed candidates obey. The relative position of RTSFX-IDENT >> IO-IDENT(ROOT) >> IO-IDENT(AFFIX) *vis a vis* previously established constraint rankings is not known. These constraints are also excluded; candidates with mismatching vowels in the root and suffix, such as (cə́x̣at), are therefore not listed. As a result of vowel harmony, some outputs (for instance, 10a, b) for transitive forms of schwa-based roots have schwa in both syllables. Note that even though the suffix’s vowel is schwa in the listed candidates, a mora is associated with it: given the underlying form /-an/, the vowel’s weight is inherent, and failure to include this information in the output would constitute a violation against IO faithfulness (cf. discussion in Chapter 4, section 4.1). While the presence of schwa in the root incurs a violation against DEP-NUC, its presence in the suffix does not: since the suffix has the underlying form /-an/, it has nuclear content in the input, unlike the root, which, being schwa-based, does not. The anti-deletion constraint MAX-NUC guards against loss of the suffix’s nucleus.

(10) /cx̣ə́t/ ‘push; tr.’

μ /√cx̣=at/	*μ/K	RT=FT& FTBIN-μ	WBYP	FTBIN -σ	WSP′	DEP- NUC	MAX -NUC	FTFORM= TROCHEE
a. μ (cə́.x̣ət)		*	*		*!	*		
b. μ (cə.x̣ə́t)		*	*			*!		*
c. μ (cx̣ə́t)		*	*	*!				
☞ d. μ (c .x̣ə́t)		*	*					*
e. μ (cə́x̣t)	*!	*	*	*		*	*	
f. μμ (cə́x̣t)	*!*			*		*	*	

In (10), candidates (e, f) are eliminated because they assign moras to obstruents, in the case of (f), in spite of being the only candidate to obey RT=FT&FTBIN-μ. Candidate (c), which, along with (e, f), posits a monosyllabic form, is ruled out by FTBIN-σ. In what remains of the field, candidate (a) is eliminated by the WSP′, and (b) by DEP-NUC, thereby allowing (d) to emerge as the winner. The winning candidate thus features a disyllabic foot with a non-nuclear syllable in the penult.

The stress pattern and foot structure for transitives /kʷášat/ and /cx̣ə́t/, analysed in (4) and (10), respectively, resemble closely those obtained for similarly structured head–theme Root=LexS words (cf. the analyses of /p’íčač/ and /c’əhús/ in Chapter 6, section 6.2.1). In contrast, the results for an /-at/ transitive form involving a schwa-based root ending in a resonant differ from those for a similarly shaped Root=LexS word (cf. the analysis of /t’ə́mus/ in Chapter 6, section 6.1.2). Although stress in both cases falls on the root’s syllable, the best candidate for /√pə́n-at/ is partially parsed and has a monosyllabic foot shape, as in (11c), while that for /√t’ə́m=us/ in Chapter 6 is fully parsed and has a disyllabic foot shape (13e). As a result of vowel harmony, the suffix vowel in the transitive form loses its essential vowel features, thus becoming more susceptible to attrition.

It was argued in Chapter 4 (section 4.1) that, in comparison to that for obstruents, the cost of associating a mora with resonants is very low (FTFORM=TROCHEE >> *μ/R). In tableau (11), WBYP, which incurs noncrucial violations from each of the listed candidates, the WSP′, which is noncrucially violated by candidates (a, b), and PARSE-σ, which is disobeyed by candidate (c), are not shown due to lack of space. Recall from earlier chapters that ALIGNR-WD is responsible for the alignment of a foot at the right edge of the prosodic word. Recall also the constraint rankings RT=FT&FTBIN-μ >> ALIGNR-WD >> WBYP and FTFORM=TROCHEE >> PARSE-σ.

(11) /pə́nt/ 'bury; tr.'

μ √pn=at	CODA -R	ONSET	RT=FT& FTBIN-μ	ALIGN R-WD	FTBIN -σ	DEP- NUC	MAX -NUC	FTFORM= TROCHEE	*μ/R
a. μ (pə́.nət)	*!		*			*			
b. μ μ (pə́n.ət)		*!				*			*
☞ c. μ (pə́n)t				*	*	*	*		*
d. μ (pə́nt)			*!		*	*	*		*
e. μ (p. nə́t)			*!					*	

In (11), candidate (a) is ruled out by CODA-R, candidate (b) by ONSET, and candidates (d, e) by RT=FT&FTBIN-μ. This leaves candidate (c) to win, even though it fails to align a foot at the extreme right edge of the word in accordance with ALIGNR-WD.

The analysis thus far has not fully accounted for the fact that some transitive forms (like the just analysed /pə́nt/) surface without the suffix vowel. To facilitate discussion, some of the data previously listed in (2) are repeated here in (12).

(12) Root + control transitive /-at/

a. Full-vowel roots: stress on root

čáw-at	'help'	pál-t	'skim off'
cíx^{w}-it	'reach'	líx^{w}-t	'put down'

b. Schwa-based roots with obstruent as C_2: stress on suffix

cx̣-ə́t	'push'	q'^{w}š-ə́t	'play with (s.o. or s.t.)'

c. Schwa-based roots with resonant as C_2: stress on root

pə́n-t	'bury'	yə́w-t	'to praise'

d. Disyllabic roots: stress on root

kʷə́laš-t	‘shoot’	ʔə́xʷaʔ-t	‘give’
ʔína-t	‘say what?’	ʔámʔəq’-t	‘deliver’

An examination of the data in (12) shows that the suffix vowel surfaces predictably only under stress, as is the case in (12b); in fact, the only instance in which the vowel manifests in the data is in combinations with a monosyllabic root containing a full vowel, (12a), and even there its appearance is not consistent. In the Kuipers corpora, approximately two-thirds of disyllabic transitive stems containing a full vowel in the root also include a suffix vowel in the output. This suggests that a given input /√CAC-at/ should yield the two possible outputs /CACAt/ and /CACt/, although judging from number counts, the first of these forms is preferred. According to Kuipers (1967), however, there appears to be little speaker variation for a form based on a given root, while at the same time, the presence or absence of the vowel is apparently not predictable; these factors indicate that lexicalization is involved. Given the circumstances, the variation is probably best explained in terms of the relatively low ranking of the MAX-NUC constraint, which, as mentioned, stipulates that a nucleus in the input must also be present in the output; a low ranking for MAX-NUC is indicated by the fact that unstressed vowel reduction and elision are a common occurrence in the language.

Although the suffix vowel is present in the output of more than half of /-at/ transitives involving a monosyllabic root with a full vowel, it is unusual for the vowel to surface in combinations with disyllabic roots, as the exemplary data in (12d) show (for instance, /√kʷəlaš-at/ surfaces as /kʷə́lašt/, never as */kʷə́lašat/; cf. /kʷášat/, which is formed on a monosyllabic root). The fact that the vowel shows up in combinations with monosyllabic roots, but not in those with disyllabic roots, suggests that it is more likely to be retained when it is part of a wellformed, binary syllabic foot than when it is not.[9]

The tableau in (13) contains an analysis of a transitive form based on a disyllabic root. Only candidates that adhere to the high-ranking CODA-R and ONSET are considered in the tableau; these constraints are therefore excluded, along with the low-ranked *μ/R, which is violated by all candidates.

(13) /kʷə́lašt/ 'shoot; tr.'

μ μ √kʷláš=at	RT=FT& FTBIN-μ	ALIGN R-WD	WBYP	FTBIN -σ	WSP′	DEP- NUC	MAX -NUC	FTFORM= TROCHEE
a. μ μ μ (kʷə́ l a)(šat)	*!		*		**	*		*
☞ b. μ μ (kʷə́ l ašt)			**		*	*	*	
c. μ μ (kʷə́ l aš)t		*!	*		*	*	*	
d. μ μ μ (kʷə́ l a.šat)	*!		*	*	**	*		

In the tableau, RT=FT&FTBIN-μ eliminates candidates (a, d); the former contains one illformed, monomoraic and monosyllabic foot (along with a moraically and syllabically wellformed one), the latter, an illicit trisyllabic foot. Given that vowel harmony is bound by the foot, it might be expected that the suffix would optimally reside outside the foot which contains the disyllabic root, as in (a, c); especially, the formation in (13c) resembles

[9]Recall from Chapter 3 that vocalic nuclei are virtually never empty in the surface forms of bare roots, which are optimally equal to a binary foot; this is so even when the root contains two schwa-based syllables (for instance, /wə́x̣əs/ 'frog').

that of the optimal candidate for /pə́nt/ (11c) in this regard. However, these candidates (that is, 13a, c) are ruled out by RT=FT&FTBIN-μ and ALIGNR-WD, respectively, and in the end the best candidate is one that encloses the entire form in a single foot.

7.1.2. The /-an/ control transitive: a GrS in the PPhrase domain

The preceding subsection showed that in words consisting of a root extended by the /-at/ transitive, stress is not only clearly dependent on phonological factors,[10] but it utilizes the same configuration of constraints required in the assignment of stress in Root=LexS words in which both components are contained within a single stem. It was evident, too, that, as in bare roots, moraic weight plays an important role in determining stress in these forms. For these reasons, it was argued that the /-at/ suffix, like lexical suffixes in a head–theme relation to the root, joins the morphological root in the PStem. Applying the same analysis to words involving the /-an/ transitive does not work, however, even though the two suffixes appear to be functionally identical.[11] The fact is that the two control transitives

[10]Correspondence theory plays a role in determining vowel quality.

[11]Both /-at/ and /-an/ are volitional transitives, and no productive distinction exists between the two. Kuipers (1967) has the following to say about the two forms:

> In the few cases where /t/- and /n/-forms occur of the same root, the former refers to an action which affects its object as a whole, the latter to one which affects it partially or superficially, cf. /ɬx̣ʷ-ut/ 'spit (something) out' *vs.* /ɬə́x̣ʷ-n/ 'spit (at someone)', /qʷa-t/ 'save, rescue (someone)', lit. 'pull through', *vs.* /qʷa-n/ 'perforate (something)'; originally also /cu=t/ 'say (something)' *vs.* /cu-n/ 'tell, order (someone)' ... The distinction is not productive; from a synchronic point of view the suffixes /-(V)t/ and /-(V)n/ may be regarded as non-automatic allomorphs of one transitivizer (Kuipers 1967:69);

and further:

behave quite differently in terms of stress assignment. In short, whereas stress in words involving the /-at/ transitive is phonologically determined, the same is not true for those with the /-an/ transitive. The data listed in (14a-b) show that, in contrast to /CVC-at/ combinations, which surface with stress on the root only when it contains either a full vowel or a syllabic resonant (and never when it contains a post-schwa obstruent), /CVC-an/ combinations always surface with root stress.

(14) CVC root + transitive /-an/ suffix

a. Full-vowel roots: stress on root

√cáy-n	‘follow, chase’	√q’áɬ-n	‘stop’
√k^{w}áy-an	‘hide’	√wáɬ-an	‘chase away’
√číh-n	‘lift, raise’	√č’ít-n	‘bring close’
√x̣ím-inʔ	‘pull s.o.’s hair’	√p’íc’-in	‘squeeze’
√túy-n	‘leave, abandon’	√x^{w}úk’^{w}-n	pull, drag’
√múy-un	‘soak’	√núq’^{w}-un	‘poke’

b. Schwa-based roots: stress on root

√pə́c-n	‘bend, fold’	√cə́x^{w}-n	‘throw at’
√ɬə́m-n	‘pick berries’	√k^{w}ə́l-n	‘warm near fire’

c. Disyllabic roots: stress on root

√p’áyaq-n	‘correct, cure’	√táyaq’-n	‘give’
√ʔísawʔ-n	‘chew’	√t’anʔíwʔ-n	‘remove out of sight’
√t’ánam-n	‘weigh, measure’	√níq’^{w}am-n	‘make smooth’

An examination of /-an/ transitive stems in the corpus shows that, like /-at/, the /-an/ transitive frequently surfaces with an echo vowel when affixed to a monosyllabic strong root; some examples are found in (14a). If it is true, as was suggested in the last section, that the occurrence of vowel harmony in Squamish is circumscribed by the prosodic foot

The type /CáC-an/ is hard to distinguish from /CáC-n/ in careless speech; though there is no doubt that they are of two different types, it is possible that I have erred in one or the other direction in individual instances (Kuipers 1967:75).

boundary, then the fact that the vowel of the /-an/ suffix takes on the features of the root vowel indicates that the √CVC-*an* composite is again contained within a single prosodic foot. Such an analysis of √CVC-*an* is strengthened by the observation that in words where the stem for suffixation is longer than CVC, the form of the suffix is always either /-n/ or (especially under stress) /-an/, but importantly, never /-An/, where the vowel is an echo of a full vowel in the root. These sorts of cases will be examined later in the section, as they have relevance for another aspect of the analysis of -*an* suffixation.

Although the /-an/ suffix is presumably like the /-at/ suffix in that it forms a single prosodic foot with a CVC root (since foot-bound vowel harmony takes place), it cannot be analysed as sharing a PStem with the morphological root: unlike /-at/, /-an/ in CVC-*an* does not get the word stress even when the root contains no weight; compare and contrast /ɬə́m-n/ 'pick berries' versus /pə́n-t/ 'bury', and /pə́c-n/ 'bend, fold' (and crucially, not */pc-ə́n/) versus /cx̣-ə́t/ 'push'.

Suffix stress would again be the expected result if the suffix occupied a second PStem, as was posited in Chapter 6, section 6.2.2 for Root=LexS concatenations in a modifier–head relation. In fact, were this the case, one would expect not only */ɬm-ə́n/ and */pc-ə́n/, but also */q'aɬ-án/, as the head always bears the stress in such constructions unless it is unaccented. Although none of the forms with /-an/ in (14) surface with suffix stress, the suffix is patently stressable. The example sets in (15-16) show that when the /-an/ suffix appends a CVCC root or complex stem, the suffix is indeed able to surface with primary stress, especially in the case of schwa-based roots; clearly, the suffix is not unaccented.

(15) CVCC root + transitive /-an/ suffix[12]

a. Full-vowel roots: stress on suffix or on root

√x̣ícq-n ‘fell (a tree)’ (also √x̣icq-ánʔ)
√hiwq-ánʔ ‘shove, push’

b. Schwa-based roots: stress on suffix

√tmɬ-án	‘paint’	√c’ls-án	‘scour’
√čəkʷx̣-án	‘fry’	√p’əsk’ʷ-án	‘squeeze’

c. Disyllabic roots: stress on suffix

√lixʷiq-án ‘pass out food (at potlatch)’
√wiʔqa-ʔán ‘perform a (certain) dance’ (cf. √wíʔqa ‘man’)

(16) Complex CVCC stem + transitive /-an/ suffix

a. Full-vowel roots: stress on suffix or root

√q’ac’=č-ánʔ ‘embrace’ √mik’ʷ=šn-ánʔ ‘wash s.o.’s feet’
√wiq’=c-ánʔ ‘pull, force open’ (also wíq’=c-nʔ)
√x̣ʷilʔ=qʷ-ánʔ ‘cut off s.o.’s head’ (also √x̣ʷílʔ=qʷ-n)

b. Schwa-based roots: stress on suffix

√pn=qʷ-ánʔ ‘bury’ (√pən) n-√t’əq’ʷ-č-ánʔ ‘cut in half’ (√across)
√kʷəɬ=č-ánʔ ‘split in half’

c. Disyllabic roots: stress on suffix or root

√timʔá=qs-n ‘make a full turn (in canoe)’
√siɬaʔ-án-t-as ‘buy (3s obj tr)’

Although the exemplary data in (15-16) include forms based on roots containing full vowels, namely, in (15a, 16a), there appears to be considerable variation as regards the location of stress in these words (cf. /√x̣icq-ánʔ/, / √x̣ícq-n/ ‘fell (a tree)’)[13]. In contrast,

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[12]A few examples, notably /√ɬit-ánʔ/ ‘sprinkle (s.t.)’ and /√pik’ʷ-ánʔ/ ‘to smoke (meat, fish, etc.)’, unexpectedly surface with stress on the suffix in combinations with a CVC root.

[13]With respect to stress in combinations based on roots with full vowels, Kuipers points out:

forms based on roots with schwa, examples of which are listed in (15b, 16b), consistently surface with stress on the suffix.

A comparison of the CVC-*an*/ transitives in (14a-b) with the CVCC-*an* transitives in (16a-b, 15) leads to the question of why the transitive suffix never bears stress in the first instance, but frequently bears stress in the second instance. In fact, while stress is variable in CVCC roots or stems with full vowels, it is always on the suffix when the vowel in CVCC is schwa; this is in contrast to /-an/ forms of CVC roots, where stress is on the root regardless of the quality of its vowel. Thus, to find an answer to why stress patterns as it does in words consisting of root and transitive /-an/ suffix, it is necessary to examine forms based on full-vowel and schwa-based roots separately.

It was pointed out earlier in this section that the /-an/ suffix does not pattern with PStem suffixes (exemplified by incorporating lexical suffixes and the /-at/ transitive) in that the presence or absence of moraic weight in the root has no bearing on stress in words with /-an/ (unlike, for instance, in words with /-at/). If /-an/ is not subject to PStem constraints, it must be subject to constraints at a higher level of the P-Hierarchy. It was argued earlier that suffixes like /-an/ are affixed at the highest prosodic level, therefore the PPhrase: the fact that the addition of post-clitics (for instance, compare /čn‿x̣ícq-n/ and /x̣icq-ánʔ‿čn/ 'I shall fell it') can affect the outcome of surface stress in the word supports this conclusion.

In the stem-type CVCC with V other than /ə/ the stress may fall on stem or suffix or even on both; the suffix is unstressed /-n/, stressed /-án(ʔ)/, e.g. /čn‿x̣ícq-n/ *vs.* /x̣icq-ánʔ‿č-n/ 'I (shall) fell it', /n-x̣ʷílʔ-c-án/ 'open' (e.g. a door; recorded in isolation with two equal stresses), /č-n‿nx̣ʷílʔc-n/ 'I open it', /nx̣ʷilʔc-án-ka/ 'open it!' (imperative suff. /-ka/). (Kuipers 1967:76).

While the outcome of stress in CVC-*an* words has nothing to say about this, that in CVCC-*an* words does. A comparison of stress in these structures shows that the /-an/ suffix does not govern stress in the way suggested by Revithiadou's (1999) theory of head stress: if it did, it would be expected to bear stress in CVC-*an* words as well as in CVCC-*an* words, since in both cases it heads its construction. Instead, (at least in combinations with full-vowel roots) stress falls more predictably on the /-an/ suffix when it is not head, but is dominated by a following suffix or clitic, as described above; thus, we get /nx̣ʷilʔc-án-ka/ 'open it!', and not */nx̣ʷilʔc-an-ká/, which would be the expected result under a strict headedness theory like Revithiadou's.

Turning now to an OT analysis of /-an/ transitive forms, it was noted earlier in this section that the stress outcomes for CAC-*an* and CəR-*an* transitives do not differ from those in their /-at/ transitive counterparts: stress surfaces on the root in each case. In contrast, CəK-*an* transitives do differ from their CəK-*at* counterparts in that stress falls on the root in the first instance, but on the suffix in the second.

The tableaux in (17-18), which analyse CəR-*an* and CəK-*an* words, respectively, show that both forms favour an analysis similar to that for CəR-*at* transitives (for instance, like that of /pə́nt/ in tableau 11). Recall that ALIGNR-WD is responsible for the alignment of a foot at the right edge of the prosodic word. As a PPhrase suffix, *-an* is located outside the PWord. All listed candidates are in adherence with both CODA-R and RT=FT&FTBIN-μ; these constraints are therefore not included in the tableau.

(17) /ɬə́mn/ ‘pick berries’

μ [[[√ɬm]$_{PR}$]$_{PW}$-an]$_{PP}$	ONSET	ALIGN R-WD	WBYP	FTBIN -σ	WSP′	DEP-NUC	MAX -NUC	FTFORM= TROCHEE	*μ/R
a. (ɬə́m)]n			*!	*		*	*		
☞ b. μ (ɬə́m)]n				*		*	*		*
c. μ μ (ɬə́m)]ən	*!		*	*	*	*			*
d. μ μ (ɬə́m.]ən)	*!	*	*		*	*			*
e. μ μμ (ɬə́m)](ən)	*!		*	**	*	*		*	*

In (17), ONSET is violated by candidates (c-e), and WBYP by (a). This leaves candidate (b) to win. The optimal form for CəC-*an* transitives is shown as being essentially similar to that for CəR-*at* transitives (11c) except for alignment differences due to the classification of /-at/ as a PStem suffix and /-an/ as a PPhrase suffix (the /-at/ suffix is internal, and the /-an/ suffix external, to the prosodic word). Although these alignment differences do not result in a difference in surface stress for CəR- transitives with /-at/ and with /-an/, since stress is on the root in both cases, they do result in a stress difference for CəK- transitives, since stress surfaces on the root with /-an/, but on the suffix with /-at/. Compare the analysis of /pə́cn/ in (18) with that of /cx̣ə́t/ in (10).

(18) /pə́cn/ 'bend, fold'

μ $[[[\sqrt{}\text{pc}]_{PR}]_{PW}\text{-an}]_{PP}$	ONSET	*μ/K	RT=FT& FTBIN-μ	ALIGN R-WD	WBYP	FTBIN -σ	DEP-NUC	MAX -NUC	FTFORM= TROCHEE
☞ a. (pə́c)]n					*	*	*	*	
b. μ (pə́c)]n		*!				*	*	*	
c. μ (pə́c)]ən	*!				**	*	*		
d. μ (pə́.c]ən)			*!	*	**		*		
e. μμ (pə́.c]ən)				*!			*		

In (18), disyllabic candidates (d, e) are eliminated for violating RT=FT&FTBIN-μ and ALIGNR-WD, respectively. Each of the other candidates features a single monosyllabic foot formed on the root, but (c) fails on ONSET, (b) violates *μ/K, and the winning candidate is therefore (a). The optimal form, then, is one that posits a single degenerate foot on the monosyllabic root, obliging the suffix consonant to be parsed by the PPhrase.

The analyses of /ɬə́mn/ in (17) and /pə́cn/ in (18) show that the optimal form for a CəC-*an* transitive (as for CVC-*an* transitives in general) is one that aligns a foot at the right edge of the PWord, which, for -*an* transitives formed on CVC roots, coincides with the PRoot (as well as the PStem; recall that the -*an* suffix is located outside the PWord). As a result, stress in CVC-*an* transitives invariably falls on the root, whether or not it contains weight. In contrast, in transitives formed on CVCC stems, the boundary between PRoot and

PWord is not isomorphic,[14] and this allows for a different stress outcome, especially for combinations involving CəCC stems, which surface with a single stress on the suffix. This is demonstrated with the analysis of /k^{w}əɬčánʔ/ ‘split in half’ in (19).

(19) /k^{w}əɬčánʔ/ ‘split in half’

μ [[[√k^{w}ɬ]$_{PR}$=č]$_{PW}$-an]$_{PP}$	ONSET	RT=FT& FTBIN-μ	ALIGN R-WD	WBYP	FTBIN -σ	DEP- NUC	FTFORM= TROCHEE
a. μμ (k^{w}əɬč)(án)	*!	*		**	**	*	*
☞ b. μμ (k^{w}əɬ)(čán)			*	*	**!	*	*
c. μμ (k^{w}ə́ɬ)(čan)			*	*	**!	*	*
d. μμ (k^{w}əɬ.čán)			*	*	*	*	*

In (19), candidate (a), which is the only candidate to correctly align a foot at the right edge of the PWord, is ruled out because, by doing so, it incurs violations against ONSET and RT=FT&FTBIN-μ, the former crucially. Candidates (b, c, d) fare equally poorly on ALIGNR-WD and WBYP, and eventually (d) beats out (b, c) on FTBIN-σ.

A comparison of the results for the CəCC-*an* transitive analysed in (19) with those for CəC-*an* transitives, analysed in (17-18), shows why stress configures differently in the two

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[14]Although Kuipers differentiates between CVCC roots and CVCC stems, as indicated in the separate listings of the exemplary forms in (15) and (16), respectively, bare roots with the form CVCC are rare, and can usually be argued to consist of a CVC root and a consonantal suffix. For instance, /x̣ícq/ ‘fallen timber’ includes the root /√x̣íc/ ‘lying down, prostrate’ and the lexical suffix /=q/ ‘bottom, trunk’. In the analysis of transitive forms here, CVCC will therefore be analysed as a complex stem comprised of a root and a suffix, as indicated by [[√CVC]$_{PR}$ =C]$_{PS}$.

types of forms. Because of the demands of ONSET, a fully parsed CəC-an transitive will necessarily violate RT=FT&FTBIN-μ, as the root-final consonant must form the onset of the suffix's syllable, which is vowel-initial. A better analysis is therefore one that eliminates this requirement by failing to parse the suffix; this is made easier by the process of vowel harmony, which results in a reduced vowel (schwa) in the suffix, thereby permitting its erasure: MAX-NUC is relatively low in the constraint rankings. In contrast, a CəCC-*an* transitive has a built-in onset for the suffix in the form of the final consonant of the stem. For this reason, and because the CVCC stem is analysed as a complex form consisting of a root and a consonantal lexical suffix, a complete parsing is able to satisfy the requirements of both ONSET and RT=FT&FTBIN-μ. The result is a best candidate for CəCC-*an* that consists of a single disyllabic foot, where stress falls on the final syllable, which is the only syllable with weight.

In contrast to -*an* transitives formed on CəCC stems, which always surface with stress on the suffix, stress in CVCC-*an* words containing a full vowel in the stem is somewhat unpredictable, surfacing variably on the root, on the suffix, or on both root and suffix. The analysis in (20) is of /x̣icqn/ 'to fell a tree' (/x̣ícq/ 'fallen timber' > /√x̣ic/ 'lying down, prostrate', /=q/ 'bottom, trunk').

(20) /x̣ícqn/ ~ /x̣ícqán/ ~ /x̣icqán/ ‘to fell (a tree)’

µ µ √x̣ic=q-an	ONSET	RT=FT& FTBIN-µ	ALIGN R-WD	WBYP	FTBIN -σ	WSP′	MAX -NUC	FTFORM= TROCHEE
a. µ µµ (x̣ícq)(an)	*!	*		**	*	*		*
b. µ µ (x̣íc.qan)			*	**!		*		
c. µ µµ (x̣íc)(qan)			*	*	**	*!		*
d. µ µµ (x̣ic)(qán)			*	*	**	*!		*
☞ e. µ µµ (x̣íc)(qán)			*	*	**		*	
f. µ µ (x̣íc)(qn)			*	*	**	*!	*	*

The tableau in (20) shows that certain analyses will not be considered, for instance, that in (a), which violates ONSET, and that in (b), which incurs an excessive number of violations against WBYP. The remaining candidates fare equally on WBYP and FTBIN-σ, and the ranking WSP′ >> MAX-NUC favours candidate (e), which shows stress on both root and suffix. In fact, however, any one of (d, e, f) is a possible outcome for this word (and others like it), and this suggests that there may be some ambivalence as to the ranking order of the WSP′, MAX-NUC, and FTFORM=TROCHEE in the grammar (however, this ranking order is called for elsewhere).

Although a reading of Kuipers (1967) appears to indicate that primary stress in CVCC-*an* sequences with a full vowel in the stem is free to surface on either the stem or the suffix vowel (or both), a closer examination of stress in these words as they occur in texts suggests that suffix stress is more likely to occur when the word is extended by a post-clitic. For instance, compare the way stress configures in /čn‿x̣ícq-n/ *vs.* /x̣icq-ánʔ‿čn/ ‘I (shall) fell it', where primary stress falls on the root when the first person singular subject clitic /čn/ precedes the word, but on the suffix when the same clitic follows the word.[15] The difference in stress between /čn‿x̣ícq-n/ vs. /x̣icq-ánʔ‿čn/ 'I (shall) fell it', then, can be seen as due to the additional syllable the clitic provides at the rightmost edge of the word; although nonfinality is not a crucial issue in Squamish stress, a final syllable is somewhat less likely to show up with stress than a nonfinal syllable.[16] An analysis of /x̣icq-ánʔ‿čn/ is given in (21).

(21) /x̣icqán čn/ ~ /x̣ícqán čn/ 'I shall fell it (tree)'

μ μ √x̣ic=q-an čn	ONSET	RT=FT& FTBIN-μ	ALIGN R-WD	WBYP	FTBIN -σ	WSP′	FTFORM= TROCHEE
a. μ μμ (x̣icq)(án.čn)	*!	*		***		*	*
b. μ μ (x̣íc.qan)čn			*	***!		*	
c. μ μμ (x̣ic)(qán.čn)			*	**	*	*!	*
☞ d. μ μμ (x̣íc)(qán.čn)			*	**	*		
e. μ μμ (x̣íc)(qan.čn)			*	**	*	*!	*

The analysis in (21) suggests that, in terms of stress, the best surface form for /x̣ic=q-an čn/ is one with stress on both root and transitive suffix, with the clitic being incorporated into the foot that contains *-an*.

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[15]The fact that a post-clitic can affect stress in the grammatical word suggests that it must be considered part of the PPhrase.

[16]At least this is true where the Kuipers corpora are concerned; in more recent transcriptions (for instance, in Bar-el and Watt 1998, 2000), it is not the case.

This section has provided an analysis of stress in words with the /-an/ transitive. Of particular importance is the way in which stress configures differently in transitives formed, on the one hand, on CVC stems, where stress is invariably on the stem, and, on the other hand, on CVCC stems, where the location of stress is mainly dependent on vowel quality in the root, falling invariably on the suffix if the root is schwa-based. In the case of CVCC-*an* transitives with a full vowel in the root, stress is sometimes observed to fall on the root, and at other times on the suffix, the latter especially when the suffix is not final in the grammatical word (as in /x̣icqán‿čn/ 'I shall fell it'). The variable stress found when the root contains a full vowel may be a matter of free variation, as Kuipers (1967) suggests; it may also be influenced by contextual factors, such as topicalization or emphasis.

Importantly, except for the variation found when the CVCC stem contains a full vowel, the outcome of stress in /-an/ transitives is entirely predictable on the basis of the analysis that has served for virtually every other word form (excepting only modifier–head compound formations). There is therefore no reason to believe that syntactic headedness plays any role whatsoever in the analysis of words of this type, contrary to Revithiadou's prediction.

The analysis provided in this section is supported by the way stress patterns in words in which stems are extended by the /-iʔn/ suffix, which is a variation on the /-an/ transitive.

7.1.3. /-iʔn/: a variation on the /-an/ transitive

In some cases the /-an/ transitive takes the form /-iʔn/. Two main classes of examples exhibit the use of this form. The first group is composed of what Kuipers (1967:71) refers to as “recessive” transitive verbs, or verbs that, in spite of their transitive marking, behave like intransitives with respect to certain inflectional morphological operations (for instance, the 3rd singular person subject suffix, /-as/, which is required in transitive but not in intransitive constructions with 1st or 3rd person objects, is missing in these forms; see Kuipers 1967:93 for comparative paradigms); examples are listed in (22a). The second body of examples with /-iʔn/ is found in transitive renderings of stems ending in the lexical suffixes /=ač/ ‘hand’, /=ayaʔn/ ‘ear’, /=aʔan/ ‘cheek’, /=ayax̣aʔn/ ‘arm’; see (22b).

(22) Transitive /-iʔn/

a. Recessive transitive constructions

i. Stress in stem

√q^{w}ə́łq-iʔn[17]	‘rap, knock’	√x̣^{w}ə́š-iʔn	‘splash’
√pə́k’-iʔn	‘puff, splash’	√píč’-iʔn	‘flash’
√k^{w}ə́m-iʔn	‘thump’	√cík’^{w}-iʔn	‘start, twitch (of fright)’
√sáy(ʔ)-iʔn	‘be audible’	√ʔə́x̣^{w}-iʔn	‘cough’

ii. Stress in stem and on suffix

√č’iík’^{w}n-íʔn ‘gnash one’s teeth’

b. Transitives of stems ending in/=ač/, /=ayaʔn/, /=aʔan/, /=ayax̣aʔn/

i. Stress in stem

√p’aʔ=áč-iʔn[18]	‘grab someone by the hand’
√p’aʔ=áyaʔn-iʔn	‘grab someone by the ear’ (also √p’aʔ=áyaʔn-íʔn)
√ciq=áyaʔn-iʔn	‘stab someone’s ear’ (also √ciq=áyaʔn-íʔn)
√q^{w}əh=áyaʔn-iʔn	‘perforate someone’s ear’
√ciq=aʔán-iʔn	‘stab someone’s cheek’
√mik’^{w}=ayáx̣aʔn-iʔn	‘wash someone’s arms’ (also mik’^{w}=ayáx̣aʔn-íʔn)

[17]In terms of stress, this form does not fit the general pattern: the analysis of CVCC stems (see previous section) predicts */q^{w}əłqíʔn/, that is with stress on the suffix rather than on schwa in the root. I have no explanation for this exception.

[18]The root is variable, catalogued in Kuipers (1967) as *p’iʔ (=p’ihʔ), p’aʔ (=p’əhʔ), p’əh* (see Appendix A).

ii. Stress on suffix (and optionally on root)

√mik’ʷ=ač-íʔn	‘wash someone’s hands’ (cf. √mík’ʷ=us-n, etc.)
√q’ap’=ač-íʔn	‘seize s.o.’s hand (with beak, etc.)’ (also √q’áp=ač-íʔn)

The examples in (22) show that stress in words featuring the /-iʔn/ variant of the transitive /-an/ suffix functions in the same way as it does in words with the plain /-an/ transitive. Thus, when the suffix is affixed to a bare monosyllabic root, as exemplified in (22a.i), stress surfaces on the root, while in combinations with disyllabic roots with penultimate stress (22a.ii), where the stressed syllable in the root is a multiple of two syllables away from the vowel in the suffix, stress surfaces on the suffix (as well as on the root). Similarly, when the stem consists of a root and a lexical suffix, examples of which are given in (22b), stress will show up on the transitive suffix only if it is in an alternating syllable position to the designated site for stress in the stem, which is the case for the examples listed in (22b.ii), but not for those in (22b.i). Note that it is the grammatical suffix rather than the stem that retains the stress when only one of two possible stresses surfaces (as evidenced, for instance, by the variant forms /√q’ap’=ač-íʔn/ ~ /√q’áp’=ač-íʔn/). It is unlikely that this is due to any stress-related differences between /-an/ and /-iʔn/; rather, the probable cause is that, unlike for /-an/, placing stress on the vowel in /-iʔn/ does not result in stress being situated in a word-final illformed foot: since /-iʔn/ is disyllabic, it constitutes a wellformed foot.[19]

[19]Recall that resonants are syllabic after another consonant, including the glottal stop; therefore, the sequence *iʔn* is syllabified as [i.ʔn].

7.1.4. Summary

It remains to be explained why the /-an/ transitive differs from the /-at/ transitive in terms of stress behaviour in combinations with both CəC roots and CəCC roots or stems; a summary comparison is given in (23).

(23) Comparison of stress behaviour in /-an, -at/ transitives of CəC and CəCC stems

	-an	-at	
CəC-	Cə́C-n	Cə́R-t	C(ə)K-ə́t
CəCC-	C(ə)CC-án	Cə́RC-t	C(ə)KC-ə́t

The table in (23) shows that stress in transitives involving the /-at/ suffix is determined phonologically in that it surfaces on a root with weight (that is, one that contains a syllabic resonant), otherwise on the suffix. In contrast, the quality of the second consonant of the root or stem has no bearing on stress in transitives with the /-an/ form. Instead, stress in transitives involving the /-an/ suffix is determined by rules governing the patterning of alternating stress, a PPhrase-level phenomenon. Thus, it is only when the suffix vowel is situated in a syllable that is an even number of syllables from the main stem stress that stress can (and does, in the case of a schwa-based root) surface on the suffix. What this difference in stress behaviour suggests is that /-at, -an/ transitives are resident in different domains, with the /-at/ transitive forming part of the PStem domain, while the /-an/ transitive resides outside both PStem and PWord in the PPhrase. This is illustrated in (24). In order to simplify the illustration, the PRoot domain is not included in (24); however, recall that PStem is minimally satisfied by the presence of PRoot.

(24) Phonological domain for /-an, -at/ suffixation
$[_{PP}\ [_{PW}\ [_{PS}\ \sqrt{}\text{Root}\ \textit{-at}]_{PS}\ ]_{PW}\ \textit{-an}]_{PP}$

The preceding discussion has provided evidence for the view that a theory based on headedness cannot adequately explain the way stress patterns in grammatical constructions in Squamish. In particular, the examination of two suffixes that appear to have exactly the same function, namely, the /-at/ control transitive and the /-an/ control transitive, but which differ markedly in stress patterns, indicated that no analysis can be complete that does not include a reference to prosodic domains. A headedness- and accent-based analysis such as that proposed in Revithiadou (1999) for other Salishan languages, cannot explain the stress differences observed in concatenations with /-at/ on the one hand, and those with /-an/ on the other, for several reasons. First, although both suffixes are stressable, they are not inherently accented; if they were, they would be expected (based on observations of stress patterning elsewhere in the language) to surface with stress with much greater frequency than they do, in fact, in all cases where they are not affixed to an accented root. In the same vein, they are not inherently unaccented because if they were, they should never be stressed unless affixed to a root that is also unaccented. Second, if the theory of head stress were explanatory for these data, the suffix ought to govern word stress regardless of accent elsewhere in the word: this is precisely what happens in Root=LexS words in a modifier–head relation (see Chapter 6, section 6.2.3), but not here.

In the remainder of this chapter, I provide further evidence for a domains analysis of grammatical suffixes, beginning with an examination of the inchoative /-iʔ/, which, like the /-at/ transitive, is presumed to be a PStem-level suffix. Following that, the survey of stress patterns found in words involving personal suffixes provides additional evidence for the PPhrase, while also showing, in the /-namʔut/ reflexive, that grammatical suffixes can reside within PRoots, similarly to compounding lexical suffixes; thus, grammatical suffixes are represented at all three of the prosodic levels posited for lexical suffixes in Squamish, namely, PRoot, PStem, and PWord, as well as in the PPhrase.

7.2. The /-iʔ/ inchoative: a GrS in the PStem domain

It is proposed that the /-iʔ/ inchoative is contained within the PStem. Recall that at the PStem level, the root (or the stem for suffixation, for instance, a reduplicated stem) gets the stress if it contains a full vowel or (although not consistently) a schwa–resonant sequence, otherwise stress falls on the suffix. Examples of inchoative forms are listed in (25), where (25a) contains inchoatives formed on full-vowel roots, and (25b), those formed on schwa-based roots.

(25) Root + /-iʔ/ inchoative

a. Full-vowel roots: stress on root

√q’áx^{w}-iʔ ‘become callous’
√wúq’^{w}-iʔ ‘go downstream’
√qlím-iʔ ‘become weak’
q’əx^{w}+√q’áx^{w}-iʔ ‘become very callous’
√táyʔaq-iʔ ‘move (from one place to another)’
t’í+√tiq^{w}-iʔ ‘be getting cold’
t’í+√t’ix^{w}-iʔ ‘be descending from a hill’
q’á+√q’ax^{w}-iʔ ‘gradually become callous’
wú+√wuq’^{w}-iʔ ‘be going downstream’
√t’íq^{w}-iʔ-nit-m ‘be caught by cold weather’

b. Schwa-based roots: stress on suffix
√p’s-íʔ ‘to land, go to shore’ (√p’əs)
√x̣ʷs-íʔ ‘get fat’ (√x̣ʷəs)
√qi-íʔ ‘get bad’ (√qəy)
pə+√pxʷ-íʔ ‘be fading, getting pale’ (√pəxʷ)
tə+√ts-íʔ ‘feel cold’ (√təs)
sə+√sp-íʔ ‘become stiff’ (√səp)
ɬə+√ƛ’q’ʷ-íʔ ‘be getting dark’ (√ƛ’əq’ʷ)
√ƛ’q’ʷ-íʔ-nit-m ‘be caught by darkness’

While stress in the examples with full-vowel roots (25a) patterns exactly as would be expected in the PPhrase domain (as well as in the PStem),[20] the fact that combinations with monosyllabic schwa-based roots, such as /x̣ʷəs/ in /x̣ʷs-íʔ/ ‘get fa t’, surface with stress on the suffix suggests that /-iʔ/ is not a PPhrase suffix. If it were, stress would be expected to surface on the root (or in the reduplicated stem) rather than on the suffix (cf. /kʷə́l-n/ ‘warm near fire; tr.’, < *-an*).

Instead, stress in inchoative forms behaves exactly as it did in /-at/ transitive forms, as well as in Root=LexS words with an incorporated reading (Chapter 6, section 6.2.5);

[20]Some apparent exceptions are listed in (i):

(i) (č’ə+)√č’ixʷ-íʔ ‘get dry’ (√č’iʔxʷ, č’ixʷ-)
(tə+)√tawʔ-íʔ ‘become bright, light’ (cf. tu+√táwʔ-iʔ < təw+√táwʔ-iʔ)
√č’ixʷ-í=qin ‘be thirsty’ (lit., ‘have one’s throat be dry’)
√tawʔ-íʔ-nit-m ‘be caught by bright light’

Note that stress on the reduplicant in, for instance, /t’í+√t’iqʷ-iʔ/ ‘be getting cold’, does not argue against the pattern because the stem for suffixation here is the reduplicated stem, which, for CV- reduplication, places stress on the reduplicant (see Chapter 5, section 5.2.2).

recall that the correct stress results in those concatenations were obtained by the interaction between prosodic factors (mainly to do with the presence or absence of moraic weight in a syllable) and (in the case of lexical suffixation) morphological accent. The suffix in this case is clearly stressable, and stress can therefore be explained on the basis of phonological factors alone. Thus, the correct stress results for inchoative forms can be obtained by an analysis similar to that used for /-at/ suffixation.[21]

The tableaux in (26-27) contain analyses of inchoative forms built, respectively, on a root with a full vowel (/q’áx^{w}iʔ/ ‘become callous’) and on one with schwa (/x̣^{w}síʔ/ ‘get fat’).

(26) /q’áx^{w}iʔ/ ‘become callous’

μ μ √q’ax^{w}-iʔ	ONSET	RT=FT& FTBIN-μ	ALIGN L-WD	ALIGN R-WD	WBYP	FTBIN -σ	FTFORM= TROCHEE	PARSE -σ
a. μ μ (q’áx^{w})(iʔ)	*!				**	**	*	
☞ b. μ μ (q’á.x^{w}iʔ)					*			
c. μ μ (q’a.x^{w}íʔ)					*		*!	
d. μ μ (q’á)(x^{w}iʔ)		*!			*	**	*	
e. μ μ (q’á) x^{w}iʔ		*!		*	*	*		*
f. μ μ q’a(^{w}xíʔ)		*!	*		*	*		*

[21]However, unlike the /-at/ suffix, the inchoative’s vowel does not take on the features of that in the root.

In (26) candidate (a) violates ONSET, while (d-f) all violate RT=FT&FTBIN-µ. This leaves the two candidates that form a single foot on the disyllabic concatenation (b, c), and it falls to FTFORM=TROCHEE to pick (b) as the better of these candidates.

When the root does not contain a full vowel (for instance, in /x̣ʷsíʔ/ 'get fat'), the contest is decided by DEP-NUC; thus the best candidate in (27) is (c), which does not have schwa in the output form. The analysis in (27) considers only candidates that have passed the high-ranking ONSET constraint.

(27) /x̣ʷsíʔ/ 'get fat'

µ √x̣ʷs-iʔ	*µ/K	RT=FT& FTBIN-µ	ALIGN L-WD	FTBIN -σ	WSP′	DEP- NUC	FTFORM= TROCHEE	PARSE -σ
a. µ (x̣ʷə́.siʔ)		*			*!	*		
b. µ (x̣ʷə.síʔ)		*				*!	*	
☞ c. µ (x̣ʷ.síʔ)		*						
d. µ (x̣ʷə)(síʔ)		*		*!*		*	*	
e. µ x̣ʷə(síʔ)		*	*!			*		*
f. µµ x̣ʷə(síʔ)	*!		*	*		*		*

In (27), the only candidate to obey RT=FT&FTBIN-µ is eliminated at a higher level for assigning a mora to the obstruent in the coda. Candidate (e) is ruled out by ALIGNL-WD, while (d) and (a) fail on FTBIN-σ the WSP′, respectively. Both of the remaining candidates are disyllabic, and (c) wins at DEP-NUC.

The tableaux in (26-27) show that the best analysis for a Root-*iʔ* concatenation formed on a monosyllabic root is one that includes both morphemes within a single prosodic foot.

Finally, the analysis in (28) shows that in a concatenation in which the inchoative suffix is added to a disyllabic root, the best candidate is one that leaves the rightmost syllable (which includes the suffix) unparsed. Although this candidate violates ALIGNR-WD, all other candidates are ruled out at an earlier stage of the analysis. All candidates listed in the tableau fare equally with respect to WBYP and the WSP′, which are therefore not shown.

(28) /táyaqiʔ/ 'move'

μ μ μ √tayaq-iʔ	ONSET	RT=FT& FTBIN-μ	ALIGN L-WD	ALIGN R-WD	FTBIN -σ	FTFORM= TROCHEE	PARSE -σ
a. μ μ μ (tá.ya.qiʔ)		*!			*		
b. μ μ μ (táyaq) iʔ	*!		*	*			*
c. μ μ μ (táya)(qiʔ)		*!			*	*	
☞ d. μ μ μ (táya)qiʔ				*			*
e. μ μ μ ta(yá.qiʔ)			*!				*

In (28), candidate (b) is eliminated by ONSET, while (a, c) fail on RT=FT&FTBIN-μ. The moraic wellformedness of (d, e) permits these candidates to slip past RT=FT&FTBIN-μ, and candidate (e) is subsequently ruled out by ALIGNL-WD, leaving (d) to win.

This completes the initial evidence for a domains analysis of stress in Squamish words involving grammatical suffixation. The analyses contained in these sections have shown that grammatical suffixes are found at two prosodic levels: the /-at/ and /-an/ control transitives were used to demonstrate that grammatical suffixation occurs at the levels of the PStem and the PPhrase, respectively, while the inchoative /-iʔ/ served to cement the PStem level analysis. Importantly, a headedness theory (like that proposed by Revithiadou 1999) played no role in the account of stress in words involving grammatical suffixation at either the PStem or the PPhrase levels.

The next section examines stress in words involving personal suffixation, which provide further evidence for a domains analysis.

7.3. Personal suffixes: further evidence for a domains analysis of GrS

Squamish designates information about subject and direct object (including plurality) by means of suffixes added to the stem[22]; in addition, except for 1st and 2nd person singular, which are prefixal, possessive affixes are in the form of suffixes. For the most part, these main classes of personal affixes are not shown with stress in the data; however, the partial paradigm in (29) of the factual construction suggests that as suffixes they may surface with (probably secondary) stress if they are not word-final.

[22] 1st and 2nd person subject information can also be in the form of clitics, in which case the form is preceded by /č-/, for instance, as in /čn/, which relays the information '1st person sg. subject' (cf. the corresponding prefix /ʔn/). The clitic can either precede or follow the word (e.g., as /čn‿x̣ícq-n/ vs. /x̣icq-ánʔ‿čn/ 'I shall fell it').

(29) Partial factual paradigm based on /s-√čáw-at/ (NOM-√help-TR) (Kuipers 1967:91)

a. ʔn-sč’áwat-umi
1s.PS- -2.OB
‘my helping you (sg.)’

b. ʔn-sč’áwat-umi-wit
1s.PS- -2.OB-PL
‘my helping you (pl.)’

c. sč’áwat-umi-čət
-2.OB-1p.PS
‘our helping you (sg.)’

d. sč’áwat-umi-čát-wit
-2.OB-1p.PS-PL
‘our helping you (pl.)’

e. ʔn-sč’áwat-an[23]
1s.PS- -1s.SB
‘my helping him’

f. ʔn-sč’áwat-án(-wit)
1s.PS- -1s.SB(-PL)
‘my helping them’

The forms in (29) show that stress, where it surfaces on personal suffixes, is not limited to particular suffix classes, as it can occur at least on possessive suffixes, as seen in (29d), and on subject suffixes, as shown by (29f). Moreover, stress does not surface on a personal suffix that constitutes the final syllable of a word, as exemplified by (29a, c, e), while the same suffix may surface with stress when (at least implicitly) followed by /-wit/, a suffix added to 3rd personal (singular) suffixes to indicate plurality.

It can further be noted that the second stress in these forms surfaces on a syllable that is a multiple of two syllables to the right of the stem stress. This is exactly the pattern found in words with the /-an/ transitive, and indicates that personal suffixes are similarly in the PPhrase domain.

In addition, Squamish has a number of reflexive and reciprocal suffixes, which contribute to the stress pattern in different ways, and these are discussed here in sections 7.3.1 and 7.3.2, respectively.

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[23] The 3rd person object has a zero form.

7.3.1. Reflexive suffixes

Reflexive suffixes in Squamish take one of three forms: /-sut/, which attaches to transitive /(-an)-t-/ stems; /-numut/, which adjoins bare stems as well as stems extended by the /-m-/ intransitive; and /-namʔut/, which is affixed to causative /-s-t-/ stems. The use of these reflexives is illustrated in (30-31).

(30) Control reflexive /-sut/

√mík’^{w}-in-cut	‘wash oneself’
√k’^{w}ə́laš-cut	‘shoot oneself’
q’an+√q’án-acut	‘walk back and forth’
t-q’á+√q’an-ácut	‘be returning the way one has come’
√x̣^{w}iaq’^{w}-án-cut	‘work one’s way through’
√x^{w}ak’^{w}i-án-cut	‘get drunk’ (lit. ‘make oneself drunk’)
√ʔə́q^{w}-n-cut	‘moult’ (√fall out (ab. hair))
√ʔəcq’-ánʔ-cut	‘throb’
pə+√pt-ícut	‘have a match, competition’
√šq-ə́cut (<-t-sut)	‘finish, get ready’
√yə́w-cut (<-t-sut)	‘brag (= praise oneself)’

(31) Non-control reflexive /-numut/

√k’^{w}áč=us-numut	‘see one’s own face’
√šúk’^{w}-um-numut	‘get a chance to take a bath’
√k^{w}ə́laš-numut	‘shoot oneself accidentally; get a chance to shoot’
√t’áyaq’-numut	‘get angry’
q^{w}a-númut	‘escape’ (lit., ‘get through’) (√q^{w}əh ‘perforate’)
√tə́l-numut	‘to realize s.t.’

With one exception in the corpus (namely, /√q^{w}a-númut/ ‘escape’, lit., ‘get through’, based on a schwa-based root, namely, /√q^{w}əh/ ‘to perforate’; but cf. /√tə́l-numut/ ‘to realize something’, which is also formed on a root with schwa, but has stress on the root), these forms never surface with stress. Moreover, /-numut/ has no observable effect on stress in words based on full-vowel roots, but it appears to have an effect when the root is schwa-based, as is the case in /√q^{w}a-númut/ (< √q^{w}əh), although there is limited evidence. This suggests that this suffix, like both the /-at/control transitive and inchoative /-iʔ/, is attached at the level of the PStem, where stress falls on the root if it contains a full vowel, but on the suffix if the root is schwa-based. It is clearly not attached at the PWord level, where */√q^{w}a-numút/ would be the expected outcome; recall that at this level a word-final syllable is preferred for stress over a schwa-based syllable in the root, provided that it is in an alternating syllables pattern relative to the root's syllable. Stress on the root in /tə́l-numut/, the only other form in (31) that contains a schwa-based root, is also in line with a PStem analysis; recall that suffixes at this level tended to assign stress to a root with weight (e.g., /pə́n-t/ 'bury; tr.' vs. /cx̣ə́t/ 'push; tr.').

However, the /-sut/ form of the reflexive (30) cannot be a PStem suffix. If the /-an/ suffix is operative at the PPhrase level, then the same must hold true for /-sut/, given that /-sut/ follows /-an/ in words in which both of these suffixes are present (for instance, in /x^{w}k'^{w}i-án-cut/ 'get drunk'). The /-sut/ reflexive must therefore be in the PPhrase domain, and fails to surface with stress here only because it is never found in a non- word-final position.

In contrast to the control and non-control reflexive constructions seen in (30) and (31), respectively, those based on causative constructions exhibit an entirely different stress pattern, as the data in (32) show.

(32) Causative reflexive /-namʔut/

k’ʷa+√k’ʷč-s-t-ə́namʔut	‘look at oneself’ (cf. k’ʷák’ʷč-t ‘look at; tr.’)
√ʔalʔ-s-t-ə́namʔut	‘feel hurt, insulted’ (cf. ʔalʔ-s ‘feel sorry for someone’)
q’əc’+√q’ac’=č-s-t-ə́namʔut	‘hug oneself’ (cf. q’ac’-č-ánʔ ‘embrace’)
n-s-ʔi+√ʔx̣-s-t-ə́namʔut	‘take care of oneself’ (lit., ‘cause oneself to have shame’; cf. ʔíx̣-i ‘have shame, be ashamed’; ʔəx̣+ʔí+√ʔx̣-in ‘call names, call down; tr.’)

The examples listed in (32) show that words containing the causative reflexive always surface with primary stress on an epenthetic vowel situated between the causative stem and the reflexive suffix. This stress pattern resembles exactly that found in a subset of words with the lexical suffix /=wiɬ/ (see Chapter 6, section 6.2.2), specifically, words in which the root and lexical suffix were in a modifier–head relation. Recall from that section that Root=LexS words exhibiting this type of relation were analysed as dual-stem compounds in which the lexical suffix, as head, commanded stress regardless of any phonological and regardless of morphological accent elsewhere in the word. Because /=wiɬ/ was lexically unaccented, it could not itself bear stress; however, it could and did prevent stress from surfacing in the stem occupied by the root, and it did this by preposing a schwa into its own stem for stress purposes. The fact that causative reflexive constructions show the same sort of stress pattern indicates that this suffix must be considered a PRoot level suffix, like /=wiɬ/, which resides in the second of two PStems.

7.3.2. Reciprocal suffixes

Squamish has two reciprocal suffixes that, in terms of usage, pattern somewhat similarly to the reflexive forms; the two forms are /-way/, which, like the reflexive /-numut/, is affixed to unmarked stems, and /-nəwʔas/, which attaches to both causative and control transitive stems. Examples of reciprocal constructions are listed in (33-34).

(33) Control/causative reciprocal /-way, -ayʔ/[24]

√tác-anʔ.t-way	'stroke each other'
√cíq-inʔ.t-way	'poke, stab each other'
√c'áp-n.t-way	'punch each other'
nəx^{w}-√ʔáyʔ-s.t-way	'exchange (with each other)'
č'ə+√č'əw-át-ayʔ	'help each other' (√č'aw)
√ɬ'íʔ-s.t-way	'love each other' (lit., 'cause each other to be dear')
√č'ə́mʔ-t-way	'bite each other'
q'ə+√q'x̣-át-ayʔ	'argue with each other'

(34) Non-control reciprocal /-newʔas/

√k'^{w}áč-nəwʔas	'see each other'
nəč'+√náč'-nəwʔas	'differ from each other'
šə+√šmʔán-m-nəwʔas	'be enemies' (√šman 'enemy')
tx^{w}-√nčəʔámʔ-nəwʔas	'be how (related) to each other?' (cf. tx^{w}-√nčəʔ-ámʔ 'be how? be how much?')
√čə́mʔ=us-nəwʔas	'be of assistance to each other' (√čə́mʔ=us 'meet')
√qə́x^{w}-nəwas	'gather together; itr.' (√be gathered together)
ʔəs-t'á+√t'q'-nəwʔas	'lie across each other' (√t'aq', t'əq' 'across, transverse')
√mə́s-nəwʔas	'stick together, adhere; itr.' (√məs 'be stuck to')

The data sets in (33-34) show that, like the reflexive /-sut/ (see section 7.3.1), neither /-way/ nor /-nəwʔas/ has any effect on stress in the word: stress is exactly as it would be

[24] The reduced form, namely, /-ayʔ/, occurs following a stressed syllable.

without these suffixes (for instance, stress surfaces on the schwa-based, weightless root in /√qə́x^{w}-nəwas/ 'gather together' even though the suffix contains a full vowel, and therefore weight). This indicates that they are neither PStem nor PRoot, but rather PPhrase, suffixes. This conclusion is not negated by the failure of either suffix to surface with stress when it is in a position to bear alternating stress: both /-way/ and /-nəwʔas/ are prevented from surfacing with stress because the result for both would mean stressing a word-final syllable.

The classification of /-way/ (33) with PPhrase-level suffixes is bolstered by the observation that this suffix, like /-sut/, is positioned to the right of the /-an/ transitive (for instance, in /tác-anʔ-t-way/ 'stroke each other'), which was shown in section 7.1.2 to be operative at the PPhrase level. In contrast, /-nəwʔas/ (34) attaches to an unmarked stem, but as the new examples in (35) indicate, /-nəwʔas/ can itself be followed by the /-an/ control transitive, resulting in an additional stress in the word.

(35) Non-control reciprocal with control transitive: /-newʔas-an/

√t'áq'-nəwʔás-n	'to cross (two things)' (√t'aq', t'əq' 'across')
√mál=q^{w}-nəwʔás-n	'mix; tr.'
√x̣^{w}iɬʔ-nəwʔás-n	'take apart' (√come off, out)
√mə́s-nəwʔás-n	'stick together, adhere; tr.'
√ɬa-nəwʔás-n	'pile up' (√ɬəʔ, ɬa(ʔ) 'be touched')

As the examples in (35) show, adding the /-an/ transitive to a reciprocal stem results in a second prominence showing up on the final syllable of the /-nəwʔas/ reciprocal suffix. Recall that primary and secondary stress are not differentiated in the Kuipers corpora; however, notice that stress in words with a single stress occurs in the suffix and not in the lexical stem (for instance, as in /√x̣ʷiɬʔ-nəwʔás-n/ and /√ɬa-nəwʔás-n/): this suggests that the rightmost stress is the main stress in the word. This again supports the classification of this suffix as a PPhrase-level suffix: it is in a position for alternating stress and stressing it does not tend to result in word-final syllable stress.

7.4. Prosodic domains versus headedness

According to Revithiadou (1999), the fact that a grammatical suffix is the functional head of a word in which it is situated gives it special status with respect to stress in the word: specifically, unless it is unstressable it will bear the primary word stress. The survey of inflected forms in the preceding sections has shown that this analysis does not work for Squamish, where the prosodic domains of PRoot, PStem, PWord, and PPhrase form an integral part of the analysis. While at first glance the outcome of stress in words involving inflectional suffixes at the PPhrase level (most notably, the /-an/ control transitive) suggests that headedness may have a role to play in the stress assignment process in that stress is more likely to be seen on or closer to the head of the grammatical word (which is the grammatical suffix), the effect (if any) is diminished by the greater importance given to phonological factors in stress assignment, including a reluctance to stress inexhaustively parsed or degenerate-footed word-final syllables, as well as syllables that are not properly positioned to receive alternating stress. Moreover, with the exception of one suffix, namely, the /-namʔut/ (causative) reflexive, which is argued, on the basis of its similarity to the lexical suffix /=wiɬ/ in its effect on stress, to be a PRoot-level phenomenon, the headedness factor has no bearing whatsoever on stress in words involving PRoot and PStem suffixes.

Justification for a domains-based analysis of inflected forms in Squamish comes from the observation that given classes of suffixes behave in markedly different ways when it comes to their effect on word stress. For instance, the different stress outcomes observed in words transitivized by /-at/ on the one hand, and /-an/ on the other, demands an interpretation of the one as a PRoot-level suffix, and the other as a PPhrase-level one, even though both are not only transitive suffixes, but control transitive suffixes. Likewise, stress in reflexive constructions is also clearly domain-driven, as a different stress pattern is observed with each of the three (morphologically determined) forms of the reflexive suffix; consequently the control /-sut/ and non-control /-numut/ are classed as PPhrase- and PStem-level suffixes, respectively, while the causative /-namʔut/ is identified as being situated in the PRoot of the second of two PStems, and thus subject to PWord-level constraints.

Importantly, and this fact bears repeating, headedness is completely irrelevant to the outcome of stress in Squamish words involving suffixes found in the PStem of a single-stem word, for instance, /-at/, /-iʔ/ and /-numut/, and it plays at most a highly constrained role in the outcome of stress in words involving PPhrase suffixes, such as /-an/, and suffixes that fall within the PRoot, such as /-namʔut/. Given the variable ways in which stress patterns in inflected Squamish words, an analysis of stress in these forms is patently impossible without reference to prosodic domains.

7.5. Summary: lexical and grammatical suffixation

The general purpose of this chapter and the preceding one has been to examine the effects of suffixation on stress in Squamish words. This subject was discussed with respect to the role of lexical accent in Squamish stress, the effects on stress of adding lexical suffixes to a root/stem, and the effects on stress of adding grammatical suffixes to a stem. A particular aim throughout these chapters has been to evaluate the Squamish stress facts from the standpoint of Revithiadou's (1999) theory of head stress and head dominance, as data from a number of Salishan languages were used by Revithiadou to argue for the extension of her hypothesis to polysynthetic languages. The main findings of these chapters are summarized in the following paragraphs.

To begin with, it was found that the role of lexical accent is limited in that relatively few morphemes can be proven to have lexical accent; just as stress in roots is largely predictable, so is that in morphologically complex forms involving suffixation. The limited extent to which morphological accent plays a role in the stress system of Squamish is in contrast to Revithiadou's analysis of other Salishan languages (and non-Salishan ones as well), which relies heavily on the analysis of a substantial number of morphemes in those languages as lexically accented, a fact that Revithiadou herself remarks on; as stress across languages is mostly predictable, the occurrence in individual languages of words or morphemes with lexical accent must be considered to be highly marked.

The examination of suffixed forms in Chapters 6 and 7 shows that the theory of head stress and head domination put forward by Revithiadou has limited application to the outcome of stress in Squamish words involving suffixation. In fact, it is only at the level of the PWord, where the suffix is head, that the head truly asserts its authority, and it does not do so without exception here. In the PStem, where the root is always head, stress is determined by the interaction between morphological accent and vowel quality in the root;

here reference to the head status of the root is never required: the preference for root stress when all things are equal can be explained in more general terms, for instance, by McCarthy and Prince's (1995) ROOT FAITH >> AFFIX FAITH. Furthermore, while there is a suggestion that the head has influence on stress in the PPhrase, the effect of this influence is scarcely felt, as it is diminished both by the requirements of alternating-syllables stress and by a general ban on stressing word-final syllables that are either unparsed or parsed as degenerate feet. Whereas headedness has limited applicability to stress in suffixed forms in Squamish, the influence on stress of prosodic domains is strongly felt.

The Squamish facts provide clear evidence that, as Downing (1999) argued for Bantu, the prosodic stem and prosodic word are not equivalent, contrary to McCarthy and Prince (1986, 1993; see also Nespor and Vogel 1986, Selkirk 1986). Furthermore, the data provide some evidence that, as posited by Czaykowska-Higgins (1996, 1998) for Moses-Columbian (see also Downing on Axininca Campa), the phonological root must be considered as separate and distinct from both morphological word and prosodic word. This suggests a P-Hierarchy (Inkelas 1989, 1993; Downing 1999) that subsumes four distinct levels, as summarized in (36).

(36) Prosodic levels in Squamish

Domain	How stress affected	Examples
PRoot	Stress is subject to the default (penultimate) Moraic weight is a consideration	√Root $=\text{LS}_2$, -namʔut
PStem	Stress is evaluated on the basis of lexical accent and phonological considerations Moraic weight is a consideration	$\text{PRoot}=\text{LS}_1$ PRoot-iʔ, -numut
PWord	Stress is dictated by the functional head Lexical accent is generally irrelevant Phonological considerations don't count	$\text{PStem}=\text{LS}_2$ PStem-namʔut
PPhrase	Alternating stress pattern prevails Phonological considerations (e.g., relating to schwa stressability) are taken into account	PWord-an PWord-sut, -way

The schema in (37) compares morphological and phonological domains for suffixation in Squamish, based on the patterns of lexical and grammatical suffixation examined in Chapters 6 and 7.

(37) Comparison of morphological and phonological domains for suffixation

a. Morphological domain:

$[_{\text{MW}}\ \ [_{\text{MS}}\ [_{\text{MR}}\sqrt{}\text{Root}]_{\text{MR}}\ =\text{LS}_{\text{inc}}\ \ \ =\text{LS}_{\text{cmp}}\ \ ]_{\text{MS}}\ \ ]_{\text{MW}}$

-at, -iʔ   -namʔut   -an

b. Phonological domain:

$[_{\text{PP}}\ [_{\text{PW}}\ [_{\text{PS}}\ [_{\text{PR}}\ \sqrt{}\text{Root}]_{\text{PR}}\ =\text{LS}_{\text{inc}}]_{\text{PS}}\ [_{\text{PS}}\ [_{\text{PR}}=\text{LS}_{\text{cmp}}]_{\text{PR}}\ ]_{\text{PS}}\ ]_{\text{PW}}\ \ ]_{\text{PP}}$

-at, -iʔ   -namʔut   -an

The distribution in (37b) shows that suffixes in Squamish are active at three distinct levels of the phonology: incorporating lexical suffixes and grammatical suffixes like the inchoative and the /-at/ transitive are found at the PStem level; compounding lexical suffixes and grammatical suffixes such as the /-namʔut/ reflexive are found in the PRoot; and the /-an/ transitive joins the majority of grammatical suffixes in the PPhrase. This differs from the morphological domain (37a), where suffixes are found only at the stem and word levels. Although no suffix belongs specifically to the PWord level, the inclusion of PWord is necessary to account for activity that occurs outside the PStem, but still at the lexical level, for instance, the competition for stress between competing stems in compound Root=LexS formations in a modifier–head relation.

The findings attest to two main boundary discrepancies between the two domains. The first of these places both lexical suffix types, all part of one morphological stem, in separate phonological stems; and the second puts morphological word-level grammatical suffixes like the /-an/ transitive, in the phonological phrase.

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Appendix A
Squamish Roots

This appendix contains a listing of roots found in Kuipers (1967, 1969), along with their glosses, segmental structure, and (for monosyllabic roots), whether the form occurs in Kuipers as a free root. Stress is as indicated in Kuipers; as such, it is consistently included only for roots containing more than one vowel. Individual roots are categorized in terms of vocalic content, and appear in the following order: full vowel roots, schwa-based roots, mixed roots, variable roots. For each of these categories, roots with one vowel are listed first, those with two vowels follow, and so on. Roots contained in each table are listed in the alphabetic order utilized by Kuipers (as in Kuipers, the glottal stop is ignored in the alphabet order):

p p’ m t t’ c c’ s n č č’ š ɬ ƛ’ l k k’ kʷ k’ʷ xʷ q q’ q’ʷ x̣ x̣ʷ h w y ə a u i

Table A1. Full-vowel roots: 1 vowel

Root	Gloss	Structure	Free?
ptúsm	cross oneself (maybe pt=us-m)	KKVKR	F
pan	?	KVR	
pumʔ	swell	KVRʔ	F
puš	cat	KVK	F
p’lač’m	[small type of cedar canoe]	KRVKR	F
p’ac’	to sew	KVK	
p’ač’	hot	KVK	F
p’akʷ	float	KVK	
p’ic’	get squeezed, trapped	KVK	F
p’iq’ʷ	?	KVK	
p’íč’t	charcoal, ashes, black paint; coal	KVKK	F
mam	father, daddy (address)	RVR	F
mat	mat (Eng.)	RVK	F
man	father	RVR	F
maɬ	?	RVK	F
máʔkʷɬ	get hurt	RVʔKK	F
maq’	thick, coarse (ab. rope, yarn, wool)	RVK	F
may	forget	RVR	F

Root	Gloss	Structure	Free?
muʔ	drop	RVʔ	F
mut	?	RVK	
ʔmút	assume a sitting position	ʔRVK	F
muy	submerge, be soaked	RVR	F
mik’ʷ	be washed, clean	RVK	
miq’	fish without net (in river)	RVK	F
tmixʷ	earth, land, dirt (cf. Cw. tə́məxʷ)	KRVK	F
tqat	ask what’s going on, etc.	KKVK	F
tam	[interrogative]	KVR	F
taqʷ	to drink	KVK	F
tax̣	?	KVK	
tawʔ	bright, light	KVRʔ	F
tay	canoe-race	KVR	F
túmlqɬ	starfish	KVRRKK	F
tuqʷ	?	KVK	
tuy	go across a body of water	KVR	F
tim	stretch	KVR	
tin	?	KVR	
tic	?	KVK	
tiqʷ	muddy	KVK	F
tiq’ʷ	to bump; run aground (ab. boat)	KVK	F
t’náx̣ʷtn	[man’s name]	KRVKKR	F
t’lqʷímʔ	nurse; itr.	KRKVRʔ	F
t’q’ax̣	fall backward	KKVK	F
t’am	throw white bone in /sləhíl/ game	KVR	F
t’amk’ʷ	salmon-eggs	KVRK	F
t’al	?	KVR	F

Root	Gloss	Structure	Free?
t’ax^{w}	to come out	KVK	F
t’ut	former	KVK	F
t’uɬ	?	KVK	
t’uk’^{w}	go home	KVK	F
t’uq^{w}	?	KVK	
t’úyʔt	medicine	KVRʔK	F
t’ix^{w}	descend	KVK	F
t’íʔq^{w}m	flame	KVʔKR	F
t’iq^{w}	cold (ab. weather)	KVK	F
cam	two	KVR	
cač	send (things)	KVK	F
cax^{w}	?	KVK	
caq^{w}	bleed	KVK	F
cayʔ	come out of house to look at s.t. unusual	KVRʔ	F
cu	say, tell	KV	F
cúmn	eyebrow	KVRR	F
cut	toy	KVK	F
ciʔ	there is (available)	KVʔ	F
cix^{w}	get somewhere, reach, arrive	KVK	F
ciq	get stabbed, speared, poked	KVK	F
cix̣	act quickly, hurry	KVK	F
c’mʔálʔ	arrow	KRʔVRʔ	F
c’mʔílʔ	thin, flat	KRʔVRʔ	F
c’k’^{w}íʔns	tuberculosis	KKVʔRK	F
c’q^{w}aɬč	marshy land	KKVKK	F
c’aɬ	?	KVK	
c’aq	bald	KVK	

Root	Gloss	Structure	Free?
c’aq’	get hit	KVK	F
c’ayʔ	be sheltered	KVRʔ	F
c’ayx̣	?	KVRK	
c’uʔ	come out	KVʔ	F
c’umɫ	just, a little while ago	KVRK	F
c’uɫ	cold	KVK	F
c’uys	crazy	KVRK	F
c’imʔ	eat grease	KVRʔ	F
c’iq	to leak	KVK	F
c’iqt	[type of woodpecker]	KVKK	F
c’iwʔ	s.t. that closes up solidly (like a wound)	KVRʔ	F
smác’n	proud	KRVKR	F
smʔús	head	KRʔVK	F
smic	meat	KRVK	F
stamš	warrior (cf. Cw. stáməš)	KKVRK	F
stíʔsč	size, measure	KKVʔKK	F
st’l.múʔt	old person	KKRRVʔK	F
st’lúʔm	cockle	KKRVʔR	F
st’ášm	disrespected people	KKVKR	F
sc’tíšm	harpoon-line (cedar)	KKKVKR	F
sc’náyʔ	bullhead	KKRVRʔ	F
sc’ams	Victoria	KKVRK	F
sc’iq’	mud	KKVK	F
sč’ač	splinter	KKVK	F
sʔnám	spearhead, spear	KʔRVR	F
sčáʔkʷm	smelt	KKVʔKR	F
sɫáʔlq’ʷ	in-laws	KKVʔRK	F

Root	**Gloss**	**Structure**	**Free?**
sɬíšm [əy]	rope made of twisted cedar leaves	KKVKR	F
sɬíq^{w}	flesh	KKVK	F
slmčís	ring	KRRKVK	F
sláwt’	herring	KRVRK	F
sláyʔ	bark of tree	KRVRʔ	F
slil	bunch of native blankets	KRVR	F
sk^{w}cáʔs	island	KKKVʔK	F
sk^{w}ul	school (Eng.)	KKVR	F
sx^{w}pílm	[man’s name]	KKKVRR	F
sx^{w}ax^{w}	pigmy-owl	KKVK	F
sqláwʔ	beaver	KKRVRʔ	F
sqálx̣	stick for digging clams	KKVRK	F
sqáwc	potato	KKVRK	F
sqíʔmʔq^{w}	devilfish	KKVʔRʔK	F
sqíwʔx̣	steelhead	KKVRʔK	F
sq’iʔ	dried smoked salmon	KKVʔ	F
sq’^{w}lám	berry (generic)	KKRVR	F
sq’^{w}ax̣	slough	KKVK	F
sx̣áʔmc	sap, juice	KKVʔRK	F
sx̣áltx^{w}	[man’s name]	KKVRKK	F
sx̣^{w}íʔsn	deer	KKVʔKR	F
sx̣^{w}íx̣^{w}	[type of small bird]	KKVK	F
swam	horse clam	KRVR	F
swat	who?	KRVK	F
swáls	throw away, scatter	KRVRK	F
swítn	net, spider web	KRVKR	F
syáʔtn	widow(er)	KRVʔKR	F

Root	Gloss	Structure	Free?
sat	give	KVK	
sʔaxʷ	land-/rock-slide	KʔVK	F
sáwʔt	younger children/cousins	KVRʔK	F
saʔx̣	parent/child-in-law	KVʔK	F
sax̣ʷ	rub	KVK	
sumʔ	to smell, give off odor	KVRʔ	F
sítn	basket (generic)	KVKR	F
síst’q’ls	single-bladed	KVKKRK	F
sínƛ’	elder children	KVRK	F
sil	?	KVR	
síʔl	grandparent	KVʔR	F
siq	to fly	KVK	F
siqč	shingles	KVKK	F
nsʔít	act completely, really	RKʔVK	F
naʔ	be on, at; be there	RVʔ	F
namʔ	to go	RVRʔ	F
nat	night	RVK	
natɬ	morning (cf. Cw. nɛ́təɬ)	RVKK	F
nax̣č	hand	RVKK	F
nuqʷ	noontime	RVK	F
nuq’ʷ	get poked	RVK	F
niʔč	be out in deep water; high sea	RVʔK	F
niɬ	[anaphoric]	RVK	F
člʔáqɬ	?	KRVKK	F
čan	three	KVR	F
čay	follow	KVR	
číšm	place above where one is	KVKR	F

Root	Gloss	Structure	Free?
číškʷ	to recede, ebb	KVKK	F
čiɬ	upper part, top	KVK	F
č’máš	brother-/sister-in-law	KRVK	F
č’q’ʷap	tie up hair (Indian fashion)	KKVK	F
č’umʔ	to split shakes	KVRʔ	F
č’i	near, close by	KV	F
č’iʔ	to fast	KVʔ	F
č’it	be near	KVK	F
č’iʔxʷ	dry	KVʔK	F
č’iq	rise, come up (ab. sun, moon)	KVK	F
šmán	enemy	KRVR	F
štám	to dive	KKVR	F
šam	low tide	KVR	F
šat	ammunition	KVK	F
šawʔ	bone	KVRʔ	F
šúpn	to whistle	KVKR	F
šuk’ʷ	bathe	KVK	
šič’	be all around	KVK	F
šikʷ (maybe [əy])	clam	KVK	F
ɬqáyč’	moon; month	KKVRK	F
ɬq’íʔs	know	KKVʔK	F
ɬx̣ílš	stand up	KKVRK	F
ɬásm	Indian rice	KVKR	F
ɬač	dark	KVK	F
ɬawʔ	recover	KVRʔ	F
ɬup	be way off	KVK	F
ɬumʔ	eat soup	KVRʔ	F

Root	Gloss	Structure	Free?
ɬuc’	be scabby; itch	KVK	F
ɬus	slide down	KVK	F
ɬukʷ	be out of the way	KVK	F
ɬimʔ	be accepted, approved	KVRʔ	F
ɬit’	distribute gifts at potlatch	KVK	F
ɬíc’m [əy]	emit sparks	KVKR	F
ɬič’	be cut	KVK	F
ɬik’ʷ	get hooked (up)	KVK	F
ɬiq’	(do) always	KVK	F
ɬíx̣ʷm	slug (zool.)	KVKR	F
ƛ’áɬm	salt, salt water	KVKR	F
ƛ’aqt	long (space, time)	KVKK	F
ƛ’áwkʷx̣n	goose	KVRKKR	F
ƛ’ay	be/do still	KVR	F
ƛ’úq’m	be shiny	KVKR	F
ƛ’iʔ	dear, difficult	KVʔ	F
ƛ’is	green	KVK	F
ƛ’iq	arrive	KVK	F
ƛ’íq’ʷm	to smoke	KVKR	F
ƛ’iwʔ	run away	KVRʔ	F
ʔlqáyʔ	[mythical animal]	ʔRVRʔ	F
lam	whisky	RVR	F
lamʔ	house	RVRʔ	F
law	?	RVR	
lúx̣ʷls	Lillooet people	KVKRK	F
lixʷ	fall down	RVK	F

Root	Gloss	Structure	Free?
kimʔ	nurse	KVRʔ	F
k^{w}cíʔc	person with magic power	KKVʔK	F
k^{w}táms	husband	KKVRK	F
k^{w}ay	to hide; itr.	KVR	F
k^{w}áyl	tomorrow	KVRR	F
k^{w}uʔs	spring salmon	KVʔK	F
k^{w}úsn	star	KVKR	F
k^{w}úɬn	borrow; itr.	KVKR	F
k^{w}uy	joke, be funny	KVR	
k^{w}im	?	KVR	
k^{w}íntl	to fight	KVRKR	F
k’^{w}ay	be impossible	KVR	F
k’^{w}in	how much?	KVR	F
k’^{w}ač	look	KVK	F
k’^{w}ač’	dogfish	KVK	F
k’^{w}as	be warm	KVK	F
k’^{w}uc	?	KVK	
k’^{w}uƛ’k^{w}	salt water	KVKK	F
k’^{w}úyk^{w}m	to troll; itr.	KVRKR	F
k’^{w}ič’	clean (fish, etc.)	KVK	F
k’^{w}íʔx^{w}m	screech-owl	KVʔKR	F
k’^{w}íʔqtn	fur, skin	KVʔKKR	F
x^{w}q^{w}íčn	make a net; itr.	KKVKR	F
x^{w}ač	stop raining	KVK	F
x^{w}iʔ	be lost	KVʔ	F
x^{w}ik’	guess right	KVK	F

Root	Gloss	Structure	Free?
x^{w}ik’^{w}	grey	KVK	F
x^{w}iq	?	KVK	
x^{w}íʔq^{w}lʔs	steamship	KVʔKRʔK	F
qlúmʔ	eye	KRVRʔ	F
qlím	weak	KRVR	F
qał’	be cloudy	KVK	F
qalʔq	wild rose bud	KVRʔK	F
qáqx̣ltn	[man’s name]	KVKKRKR	F
qayʔt	fin	KVRʔK	F
qix̣	sway	KVK	
q’ap’	catch a disease	KVK	F
q’átx̣mltx^{w}	[man’s name]	KVKKRRKK	F
q’ac’	be embraced	KVK	
q’ał	obstruct passage	KVK	
q’alʔ	believe	KVRʔ	F
q’ax^{w}	be callous	KVK	F
q’aw	be paid	KVR	F
q’ayt	to holler	KVRK	F
q’i	tie, knot	KV	
q’it	morning	KVK	F
q’is	be tied, knotted	KVK	F
q’ił	be healed up	KVK	F
q’ix̣	black	KVK	F
q’iwʔ	go around	KVRʔ	
q^{w}píčn	sand (cf. Cw. pq^{w}ə́cən - note metathesis)	KKVKR	F
q^{w}táycn	sturgeon	KKVRKR	F
q^{w}a	escape	KV	

Root	**Gloss**	**Structure**	**Free?**
q^{w}áɬšn	clear up (weather)	KVKKR	F
q^{w}u	water	KV	
q^{w}uy	get snagged	KVR	F
q^{w}in	be hairy	KVR	
q’^{w}ac’	tide coming in	KVK	F
q’^{w}umʔ	kelp	KVRʔ	F
q’^{w}uc	fat	KVK	F
q’^{w}uɬ	?	KVK	
q’^{w}uy	die	KVR	F
x̣ač’t	fireweed	KVKK	F
x̣awʔs	new	KVRʔK	F
x̣ip’	get nipped	KVK	F
x̣ic’	itch	KVK	F
x̣icq	fallen tree, timber	KVKK	F
x̣íʔnm	to growl	KVʔRR	F
x̣iš	cramp	KVK	
x̣iƛ’	chop, cut	KVK	
x̣iq’	be scratched	KVK	F
x̣^{w}ač	?	KVK	F
x̣^{w}ay	become senseless; faint	KVR	F
x̣^{w}uc’	be bruised	KVK	F
x̣^{w}úq^{w}m	[type of bowl]	KVKR	F
x̣^{w}uhq’^{w}	loon	KVRK	F
x̣^{w}ilʔ	come out/off	KVRʔ	F
x̣^{w}iq’^{w}	be arrested	KVK	F
hamʔ	be covered	RVRʔ	F

Root	Gloss	Structure	Free?
haʔɬ	good	RVʔK	F
haw	be not the case	RVR	F
huy	be finished	RVR	F
hinʔ	be/take a long time	RVRʔ	F
hilk^{w}	get ready (to go)	RVRK	F
hiq	be under	RVK	
hiwʔ	be upstream	RVRʔ	F
wáʔtq	to man stern of boat	RVʔKK	F
wan	lose mental equilibrium	RVR	
wač	watch (timepiece)	RVK	F
waš	be away from fire	RVK	
wuq’^{w}	go downstream	RVK	F
wip	?	RVK	
wíʔx^{w}m	fall, slide down	KVʔKR	F
yaʔ	tight	RVʔ	F
yámn	even if, although	RVRR	F
yáʔt	vomit (cf. Cw. yɛ́ʔɛt)	RVʔK	F
yaɬ	finally	RVK	F
yaq’	fall down	RVK	F
yaq^{w}	?	RVK	
yaq’^{w}	calm	RVK	F
yuɬ	burn	RVK	F
yuh	be careful	RVR	F
ʔac	surface	ʔVK	
ʔácq	outside	ʔVKK	F
ʔásq^{w}	seal	ʔVKK	F
ʔan	very	ʔVR	F

Root	Gloss	Structure	Free?
ʔáʔɬqn	wet snow	ʔVʔKKR	F
ʔáwʔt	be behind	ʔVRʔK	F
ʔáyʔx̣	crab	ʔVRʔK	F
ʔúpn	ten (objects)	ʔVKR	F
ʔúmsm	wake up	ʔVRKR	F
ʔúcq	go outside	ʔVKK	F
ʔus	show	ʔVK	
ʔux̣ʷ	cut, carve	ʔVK	
ʔuy	enter	ʔVR	
ʔi	and	ʔV	F
ʔímn	also	ʔVRR	F
ʔit	be finished	ʔVK	F
ʔiɬ	cousin (address)	ʔVK	F
ʔíɬn	eat; itr.	ʔVKR	F
ʔil	?	ʔVR	
ʔiq'ʷ	be rubbed	ʔVK	F
ʔix̣ʷ	?	ʔVK	

Table A2. Full-vowel roots: 2 vowels

Root	**Gloss**	**Structure**
pk’ʷúyin	crossbar in canoe	KKVRVR
pípa	paper (Eng. borr.)	KVKV
p’áq’ʷaɬ	be scared	KVKVK
p’áyaq	get well, recover	KVRVK
p’úƛ’am	to smoke (ab. a fire)	KVKVR
p’úq’ʷam	to foam	KVKVR
p’úhc’us, p’əʔúc’us	cradle	KVRKVK
p’uáyʔ	black-dotted flounder	KVVRʔ
mlášiš	molasses (Eng.)	RRVKVK
máqaʔ	snow	RVKVʔ
máqʷam	swamp; moss	RVKVR
míɬaʔ	(Indian) dance; to dance	RVKVʔ
míx̣aɬ	black bear	RVKVK
tála	dollar (Eng. borr.)	KVRV
timʔá	be like	KVRʔV
tímin	muscle, strength	KVRVR
tináʔ	be from, originate from	KVRVʔ
t’amʔí	go away	KVRʔV
t’ámin	animal hair	KVRVR
t’áqaʔ	salalberry; be bruised (so skin resembles salalberry)	KVKVʔ
t’áqʷalʔ	dry	KVKVRʔ
t’áyaq’	get angry	KVRVK
t’íʔqi	soak dried salmon	KVʔKV
t’íqʷap	[man’s name]	KVKVK
cáwʔin	cohoe salmon	KVRʔVR
c’q’ʷúʔum	blackcap	KKVʔVR

Root	Gloss	Structure
c’alút	grass mat used by medicine man as head cover	KVRVK
c’áliʔ	heart (physiol.)	KVRVʔ
c’áwan	fresh (ab. water)	KVRVR
c’úk’ʷam	scale (of fish)	KVKVR
c’ít’ax̣ʷ	diving duck	KVKVK
spáq’am	flower	KKVKVRʔ
smanʔáɬ	high-class person	KRVRʔVK
stáyaɬ	brother’s/sister’s child	KKVRVK
scúyayʔ	leather	KKVRVRʔ
sc’áʔqin	cattail, bulrush	KKVʔKVR
sc’úqʷiʔ	fish (generic)	KKVKVʔ
sc’uʔúcn	[a locality in Ladner]	KKVʔVKR
snɬálya	[woman’s name]	KRKVRRV
sčíʔi	strawberry	KKVʔV
sč’úɬaʔ	leaf (of tree)	KKVKVʔ
sɬák’ʷam	breath	KKVKVR
sɬawʔínʔ	bed-cover	KKVRʔVRʔ
sɬiqʷáyɬ	parent/child-in-law	KKVKVRK
skʷáʔwač	sturgeon	KKVʔRVK
skʷíc’ayʔ	sea-eggs	KKVKVRʔ
sk’ʷíwas	co-parent-in-law	KKVRVK
sxʷácit	torch	KKVKVK
sqʷaʔíls	copper	KKVʔVRK
sq’ʷúmayʔ	hair (on head)	KKVRVRʔ
sx̣íx̣nam	Chilcotin	KKVKRVR
sx̣ʷúp’aʔn	necklace	KKVKVʔR

Root	**Gloss**	**Structure**
sx̣ʷíwʔač	[type of fish]	KKVRʔVK
s(h)átaʔ	aunt	KRVKVʔ
swúq’ʷał	blanket (Indian)	KRVKVK
sʔáx̣ʷaʔ	medium-sized clam	KʔVKVʔ
sáx̣ʷiʔ	grass, hay, straw	KVKVʔ
sáyam	sour, bitter; harsh	KVRVR
sayʔáx̣	a crack, leak	KVRʔVK
sáyips	cloth-pin	KVRVKK
sútič	Squamish wind (cold north wind)	KVKVK
súk’ʷam	cedar bark	KVKVR
súyiʔč	big wall mat	KVRVʔK
nač’ímʔ	beautiful, pretty	RVKVRʔ
níčim	speak, talk	RVKVR
níq’ʷam	smooth	RVKVR
čnʔáwʔas	recline, lie down	KRVRʔVK
čáʔła	for a little while	KVʔKV
čuáš	wife	KVVK
činúkʷ	Chinook	KVRVK
čiáł	soon	KVVK
čiáq	salmon-weir	KVVK
čiáy	be, act to small degree; a little	KVVR
č’łáʔlu	white lice	KKVʔRV
č’úq’ʷa	skunk cabbage	KVKV
č’ínk’ʷu	[name of mythical serpent]	KVRKV
č’iíp	be at end/edge	KVVK
šáwaq	carrot	KVRVK
šáʔyay	gills (of fish)	KVʔRVR

Root	**Gloss**	**Structure**
šáʔyu	corpse	KVʔRV
šúkʷa	sugar (Eng. borr.)	KVKV
šuáɬ	trail; door	KVVK
šišáʔɬ	Sechelt	KVKVʔK
ɬlp'úsiʔ	loose skin, wrinkles	KRKVKVʔ
ƛ'asíp	maple sugar/syrup (Fr.?)	KVKVK
ƛ'íʔna	eulachon oil	KVʔRV
lapát	cup (Fr.)	RVKVK
latám	table (Fr.)	RVKVR
kapú	coat (Fr. capote)	KVKV
kʷašú	pig (Fr. cochon)	KVKV
kʷúpic	elder sibling	KVKVK
k'ʷát'an	mouse	KVKVR
k'ʷáxʷaʔ	box	KVKVʔ
k'ʷúnut'	porpoise	KVRVK
xʷák'ʷi	get drunk	KVKV
qáyiẋ	[man's name]	KVRVK
qáʔis, qaʔís	soon	KVʔVK
qiʔát	(do) again	KVʔVK
q'áʔmay	maiden	KVʔRVR
q'át'am	sweet	KVKVR
q'uát	drumstick	KVVK
q'iáẋ	intestines, guts	KVVK
q'iíʔč	moose, elk	KVVʔK
qʷanís	whale	KVRVK
qʷáyaẋʷ	hire; itr.	KVRVK

Root	Gloss	Structure
qʷuʔúp	crab apple	KVʔVK
q’ʷúqʷaqʷ	seaweed	KVKVK
q’ʷíʔus	spring (season)	KVʔVK
q’ʷiítq	gull	KVVKK
q’ʷiílš	to dance	KVVRK
x̣íxʷa	sea-egg	KVKV
x̣áču̓ʔ	lake	KVKVʔ
x̣ʷicús	move perpendicular to a force (Rt = x̣ʷəy ?)	KVKVK
huyáʔ	to leave, depart (Rt = huy ‘be finished’ ?)	RVRVʔ
hiʔqʷín	light, torch	RVʔKVR
hiúyʔm	be in good order	RVVRʔR
hií	big	RVV
wanáxʷ	true	RVRVK
wánim	orphan	RVRVR
wítax̣	[type of canoe]	RVKVK
yásaʔqʷ	[head-cover]	RVKVʔK
yáq’ʷam	sweat	RVKVR
yáwap	sail	RVRVK
yúlaʔ	Indian rhubarb	RVRVʔ
ʔánuɬ	agree	ʔVRVK
ʔaɬtáč	parents	ʔVKKVK
ʔaɬx̣án	downstream area	ʔVKKVR
ʔáɬi	get hurt	ʔVKV
ʔáʔxʷa	light (ab. weight)	ʔVʔKV
ʔáq’aɬ	stick in throat	ʔVKVK
ʔáx̣ʷayʔ	house-fly	ʔVKVRʔ

Root	Gloss	Structure
ʔawʔíc	fast	ʔVRʔVK
ʔáyat	black codfish	ʔVRVK
ʔúmat	be lazy	ʔVRVK
ʔúsaʔ	large blueberry	ʔVKVʔ
ʔúyumʔ	slow down	ʔVRVRʔ
ʔíƛ’i	still	ʔVKV
ʔísun	to paddle	ʔVKVR
ʔíłči	to man bow of boat	ʔVKKV
ʔíkʷi	and	ʔVKV
ʔiwʔás	fish with line in river	ʔVRVK
ʔiás	have good time	ʔVVK
ʔímac	grandchild	ʔVRVK
ʔímaš	to walk	ʔVRVK
kíʔya	mother (address)	KVʔRV
kʷax̣nís	sea-lion	KVKRVK
kʷáx̣nis	dog-salmon	KVKRVK
q’lʔáq’a	crow	KRʔAKA
x̣áʔlu	[type of spoon]	KVʔRV
x̣ʷalítn	white person	KVRVKR

Table A3. Full-vowel roots: 3 vowels

Root	Gloss	Structure
pápiaq	Vancouver Lighthouse	KVKVVK
manác'i	drum	RVRVKV
cíačis	five (objects)	KVVKVK
sɬayʔámin	[geog. place name]	KKVRʔVRVR
slíl.ʔutuɬ	Burrard Inlet	KRVRʔVKVK
sx̣imáɬaɬ	Esquimalt	KKVRVKVK
sínuɬqayʔ	[name of mythical serpent]	KVRVKKVRʔ
sʔíxʷiwat	to be jumping (ab. fish)	KʔVKVRVK
šupálitn	iron	KVKVRVKR
q'iáx̣an	fence	KVVKVR
qʷuláyus	high tide	KVRVRVK
yásawʔi	[type of tree]	RVKVRʔV

Table A4. Schwa-based roots: 1 vowel

Root	Gloss	Structure	Free?
pəc	be bent, folded	KəK	F
pən	be in the soil, dirt; be buried	KəR	
pəɬ	thick	KəK	
pəlqʷ	be kneeling	KəRK	F
pək'ʷ	form puffs or clouds of dust, smoke, spray, etc.	KəK	
pəxʷ	faded, pale	KəK	
pəx̣	?	KəK	
pəy	be in the water, awash	KəR	
p'əs	to land, go to shore	KəK	F
p'əsk'ʷ	be squeezed	KəKK	F
p'əɬ	be sober	KəK	F
p'əq'	white	KəK	F
p'əqʷ	be split off and slab-shaped	KəK	F
məc'	?	RəK	
məs	stick to, adhere	RəK	F
məsn	gall	KəKR	F
mənʔ	child, offspring	RəRʔ	F
məčn	black louse	KəKR	F
məl	round	RəR	
məlqʷ	larynx	RəRK	F
məkʷ$_1$	be wrapped up, covered	RəK	
məkʷ$_2$	be lump-shaped	RəK	
məkʷm	pick up, find things; itr.	KəKR	F
məqsn	nose	RəKKR	F
məq'	be full (from eating)	RəK	F

Root	Gloss	Structure	Free?
məx̣ʷ	dimple	RəK	
məy	sink	RəR	F
təmɬ	red paint	KəRK	F
təs	cold	KəK	
təɬ	?	KəK	
təl(ʔ)	acquire knowledge; learn, study	KəR(ʔ)	
tək’ʷ	tight (e.g., ab. clothes)	KəK	F
təx̣ʷ	settled	KəK	F
təh	?	KəR	
t’əm	be cut, wounded, hurt	KəR	
t’əmš	braiding	KəRK	F
t’əlm	wild cherry	KəRR	F
t’əkʷ	get stuck in the mud, mired	KəK	F
t’əkʷs	explode, be fired (gun)	KəKK	F
t’əq’ʷ	break; itr.	KəK	F
t’əx̣	open, branch out	KəK	
cəm(ʔ)	?	KəR(ʔ)	
cəlq’ʷ	be kicked	KəRK	F
cəq	?	KəK	
cəx̣	be pushed	KəK	
cəxʷ	get hit	KəK	F
cəqʷɬ	dark brown substance	KəKK	F
c’čəl	kingfisher	KKəR	F
c’əm	?	KəR	
c’əs	nine (objects)	KəK	F
c’əls	be shiny	KəRK	F

Root	Gloss	Structure	Free?
c’əkʷ	seven	KəK	
c’ək’ʷ	?	KəK	
c’əxʷ	be rotten	KəK	F
c’əqt	[kind of woodpecker]	KəKK	F
c’əx̣	be gone	KəK	F
c’əx̣t	gravel beach	KəKK	F
skʷəc’	willow grouse	KKəK	F
čəmx̣	pitch, resin	KəRK	F
sp’əlʔxʷm	lung	KKəRʔKR	F
sp’əhc’	blackberries	KKəRK	F
smətqsn	snot	KRəKKKR	F
st’əlx̣ʷc’	devilfish	KKəRKK	F
scəx̣ʷm	waterfall, falls	KKəKR	F
sc’əm	to angle	KKəR	F
sčənʔq	Gibson’s landing	KKəRʔK	F
sčəlʔq	Howe Sound	KKəRʔK	F
sč’əpxʷlʔ	wart	KKəKKRʔ	F
sč’əlq’s	slingshot	KKəRKK	F
skəmʔc	[small clam]	KKəRʔK	F
sk’ʷəkʷčs	red huckleberry	KKəKKK	F
sxʷəwqn	white swan	KKəRKR	F
sqəwq’	raven	KKəRK	F
sq’ʷčəm	boil, abscess	KKKəR	F
sq’ʷəlmʔxʷ	blackberry	KKəRRʔK	F
sx̣əwʔ	dried salmon backbone	KKəRʔ	F
sx̣ʷəmʔ	presents, gifts	KKəRʔ	F

Root	Gloss	Structure	Free?
səp	stiff	KəK	F
səl	turn, spin around	KəR	F
sʔəlqn	top	KʔəRKR	F
səq’	to crack, split	KəK	F
səx̣	bitter, strong (taste)	KəK	F
səhc	be left over	KəRK	F
nəp	follow closely	RəK	
nəs	oil	RəK	
nəkʷ	move, stir, shake	RəK	
čəm(ʔ)	close	KəR(ʔ)	
čəɬqʷ	pass through opening/hole	KəKK	F
čəlm	salt-water plants	KəRR	F
čəq	?	KəK	
čəx̣ʷ	?	KəK	
č’qʷəɬp	Gibson’s landing	KKəKK	F
č’əmʔ	bite; itr.	KəRʔ	F
č’ətxʷ	carve	KəKK	F
č’əxʷ	increase; itr.	KəK	F
č’əw	?	KəR	
šqʷənʔ	go far out into sea	KKəRʔ	F
šəq	be finished, complete	KəK	F
ɬx̣ənptn	floor	KKəRKKR	F
ɬəm	pick berries	KəK	
ɬəmč’	get chipped off	KəRK	F
ɬəmʔxʷ	rain	KəRʔK	F
ɬətx̣m	tremble	KəKKR	F

Root	**Gloss**	**Structure**	**Free?**
ɬəš	[a game]	KəK	F
ɬək’	wide, broad	KəK	F
ɬəq’^{w}	come off (bark of tree)	KəK	
ɬəx̣^{w}	spit	KəK	
ƛ’əp	cover	KəK	
ƛ’ətx̣m	slippery	KəKKR	F
ƛ’əx^{w}	be won, mastered	KəK	
ƛ’əq’	black	KəK	F
ƛ’əq’^{w}	dark	KəK	F
ƛ’əx̣^{w}	hard, strong	KəK	F
ƛ’əyq’	get trapped, caught	KəRK	F
ləs	bottom	RəK	F
ləwx̣	rib(s)	RəRK	F
kləx^{w}	[a game]	KRəK	F
k^{w}ən	start, begin	KəR	F
k^{w}əɬ	?	KəK	
k^{w}əɬč	be split open	KəKK	F
k^{w}əl	?	KəR	
k’^{w}əɬ	spill; itr.	KəK	F
k’^{w}əl	?	KəR	
k’^{w}əlʔ	stomach	KəRʔ	F
k’^{w}əq	be split (ab. tree)	KəK	F
x^{w}ət	wren (?)	KəK	F
x^{w}ək^{w}	be used	KəK	F
qəp’	close, shut	KəK	
qəms	be packed together	KəRK	F

Root	Gloss	Structure	Free?
qətx̣mʔ	to slip, slide	KəKKRʔ	F
qənp	set, go down (sun, moon)	KəRK	F
qəč	be full (ab. moon)	KəK	
qəl	spoil, go to waste	KəR	
qəxʷ	be gathered together	KəK	
qəx̣	much, many	KəK	F
q'xʷəwʔɬ	West Coast Chinook canoe	KKVRʔK	F
q'ət	?	KəK	
q'əc	fall short	KəK	
q'əs	get tired (waiting)	KəK	
q'əlq'	be wound around	KəRK	F
q'əx̣	?	KəK	
qʷətq	pass	KəKK	F
qʷəč	vomit	KəK	
qʷəɬ	drift ashore	KəK	F
qʷəy	be at lowest ebb	KəR	F
q'ʷəc'	wet	KəK	F
q'ʷəš	play	KəK	F
q'ʷəl	ripe	KəR	F
x̣cəm	cedar box	KKəR	F
x̣əp'	to split, break	KəK	F
x̣əm	heavy	KəR	F
x̣əč	remember	KəK	
x̣əlʔ	write; itr.	KəRʔ	F
x̣əwʔsčm	half-tide	KəRʔKKR	F
x̣əwƛ'	break; itr.	KəRK	F

Root	Gloss	Structure	Free?
x̣əyx̣	war	KəRK	F
x̣ʷəs	be fat	KəK	F
x̣ʷəy	?	KəR	
həmlc	[contagious disease]	RəRRK	F
wəɬ	be rough, wild	KəK	F
wəɬx̣s	time of last snow	RəKKK	F
wəƛ’č’	twenty	RəKK	F
yəm	cranky	RəR	F
yəc’	be full	RəK	F
yəƛ’q’	rub, paint	RəKK	F
yəl	[a plant]	RəR	F
yəqʷ	clothes	RəK	F
yəx̣ʷ	?	RəK	F
yəw(ʔ)	spiritual power	RəRʔ	F
ʔəlqsn	Point Grey	ʔəRKKR	F
ʔəqʷ	fall out (hair)	ʔəK	F
ʔəx̣	wild goose	ʔəK	F

Table A5. Schwa-based roots: 2 vowels

Root	Gloss	Structure
ƛ’əʔə́nq, ƛ’ənq	potlatch	KəʔəRK, KəRK
wəq’ə́q’	snail	RəKəK
wəx̣ə́s	frog	RəKəK
yəqə́y	to creep	RəKəR

Table A6. Mixed roots: 2 vowels

Root	Gloss	Structure
pə́lxʷla	Bella Coola	KəKRV
pícməq	[man's name]	KVKRəK
p'q'ə́lwit	white blanket	KKəRRVK
tíwət	[Indian tribe]	KVRəK
cə́ša	mother	KəKV
sməsč'ínʔ	birthmark	KRəKKVRʔ
stə́mʔxʷaɬ	[type of cloth]	KKəRʔKVK
stək'ín	Haida	KKəKVR
st'áʔməs	[geog. place name]	KKVʔRəK
st'ə́waq'ʷ	[kind of mud]	KKəRAK
sc'ə́mkʷa	tommie-cod	KKəRKV
sčámʔəqʷ	great-grandparent/child	KKVRʔəK
sɬəqtálʔ	double blanket	KKəKKVRʔ
sƛ'əɬálm	grizzly bear	KKəKVRR
sləhíl	gambling	KKəRVR
slə́wayʔ	cedarbark	KRəRVRʔ
sq'ʷúnəq	[term of pity]	KKVRəK
sxʷlawə́ʔ	turnip	KKRVRəʔ
sx̣ə́ɬ.nat	Sunday	KKəKRVK
sx̣ʷílʔ.nəč	[onion-like plant]	KKVRʔRəK
səpíq	yellow salmon	KəKVK
sə́x̣ʷaʔ	urine	KəKVʔ
nə́wa	spouse (address)	KəRV
č'ə́sp'i	ugly	KəKKV
šə́way	grow; itr.	KəRVR

Root	Gloss	Structure
ɬə́mq’ʷa	[type of flounder]	KəRKV
ɬáwləqʷ	big raft	KVRRəK
ƛ’kʷə́ni	deaf	KKəRV
ƛ’əʔášn	feast	KəʔVKR
kšáwəs, kšaws	bluejay	KKVRəK
k’ə́xʷaʔ	lacrosse	KəKVʔ
kʷə́laš	shoot	KəRVK
kʷəq’tán	shoulder	KəKKVR
kʷəwʔíʔ	leave	KəRʔVʔ
xʷəč’síʔ	interspace	KəKKVʔ
xʷəwʔáxʷ	(be) not yet (the case)	KəRʔVK
xʷmʔə́lwit	[wife of Frog]	KRʔəRRVK
qə́naxʷ	throat	KəRVK
q’ə́lya	(take a) steambath	KəRRV
x̣ə́ta	far	KəKV
x̣ʷəʔít	wedge	KəʔVK
hatə́hʔ	aunty (address)	RVKəRV
həmʔí	come	RəRʔV
hə́waʔ	accompany	RəRVʔ
hə́wan	dog	RəRVR
həwʔít	rat	RəRʔVK
wəx̣náč	half-tide	RəKRVK
yənís	tooth, teeth	RəRVK
yəɬíxʷ	Ash Slough	RəKVK
yəqínm	have tuberculosis	RəKVRR
ʔəcím	little	ʔəKVM

Root	Gloss	Structure
ʔəšánʔ	why?	ʔəKVRʔ
ʔə́li	dream	ʔəRV
ʔəqʷís	thin	ʔəKVK

Table A7. Mixed roots: 3 vowels

Root	Gloss	Structure
mə́lalus	raccoon	RəRVRVK
sməkʼʷəʔál	grave	KRəKəʔVR
stə́waqin	graveyard, corpse	KKəRVKVR
nə́wukʼʷa	coffin	RəRVKV
ƛʼəʔímin	sinew	KəʔVRVR
ləpəskʷí	biscuit (Fr.)	RəKəKKV
yətuán	salmonberry	RəKVVR
yəx̣ʷə́laʔ	eagle	RəKəRVʔ

Table A8. Variable roots

Root	Gloss	Structure	Free?
puh, pəh	blow, swell	CVC	
p'iʔ (=p'ihʔ), p'aʔ (=p'əhʔ), p'əh	grab, seize, get hold of	CVC	
mil, mal	be mixed up	CVC	
təhʔ, taʔ	undergo, etc.	CVC	F
t'ak'ʷ, t'ək'ʷ	dig	CVC	
t'aq', t'əq'	across, tranverse	CVC	F
t'aq'ʷ, t'əq'ʷ	be broken, cut, bruised	CVC	F
cik'ʷ, cək'ʷ	?	CVC	
c'əh, c'a	get hit	CVC	F
saq', səq'	crack, split	CVC	
nəh, naʔ	name	CVC	F
nač', nč'	one	CVC	
niwʔ, nəwʔ, nuʔ	be inside, inserted	CVC	F
čmʔáʔ, čə́mʔə-	carry a load	CVCV	F
ča(ʔ) [əh]	do, act, make	CVC	F
č'aw, č'əw	help	CVC	
č'ič' [əy]	be twisted; tr.	CVC	F
č'i(h), č'əh, č'a	rise, mount, go upward	CVC	F
łəhʔ, ła(ʔ)	be touched	CVC	F
łan, łən(ʔ)	weave	CVC	F
łal, łəl	food	CVC	
łuq'ʷ, łəq'ʷ	come off (ab. skin, bark)	CVC	F
ƛ'əy, ƛ'i-	stop, quit	CVC	
kat, kət	descend	CVC	F
kʷumʔ, kʷəm(ʔ)	to rise	CVC	F

Root	Gloss	Structure	Free?
k’^{w}əh, k’^{w}a	[interjection]	CVC	F
x^{w}əy, x^{w}i-	appear	CVC	F
qəy, qi-	bad	CVC	F
qanʔ, qənʔ	steal, cheat	CVC	F
qa(ʔ)q, qəq	?	CVC	F
q’an, q’ən	return	CVC	
q’ał’, q’ął’	be stopped	CVC	
q’aw(ʔ), q’əw(ʔ), q’^{w}uʔ	side	CVC	F
q’ay, q’əy, q’i	be high up	CVC	
q’il, q’əl	exert mental power	CVC	
q^{w}əh, q^{w}a(ʔ)	be perforated	CVC	F
q^{w}al, q^{w}əl	think	CVC	
q’^{w}uq^{w}, q’^{w}əq^{w}	beat, strike	CVC	F
x̣əy, x̣i-	?	CVC	F
x̣ap, x̣əp	?	CVC	
x̣ay, x̣i	laugh	CVC	
x̣ic, x̣əc	lying down	CVC	
x̣^{w}am, x̣^{w}əm	rushing current	CVC	
ʔəh, ʔa-	hurt	CVC	F
ʔəy, ʔi	good	CVC	
ʔix̣, ʔəx̣	shame	CVC	
ʔis [əy]	have good time	CVC	F

Appendix B
Squamish Affixes

This appendix contains a listing of affixes found in Kuipers (1967, 1969), along with their glosses. Affixes are categorized here by whether they are prefixal or suffixal. Since reduplication is primarily prefixal in Squamish, prefixes are subclassified in terms of whether they are non-reduplicative or personal. Suffixes are subclassified in terms of whether they have lexical (body, other, formative) or grammatical meaning. The appendix concludes with a list of clitics. In general, the listing of entries in each section again follows the alphabetic order preferred by Kuipers (see Appendix A).

Prefixes (Non-reduplicative)

m-	[formative]
t-	[formative]
tm-	‘time, season’
tl-	‘wind’
tx^{w}-	[indicates direction] (DIR-)
tut-	‘a little (distance)’
ti-^{1}	‘from, hither’
ti-^{2}	‘make, build, produce’
sx^{w}- (maybe s-x^{w}-)	‘step-’ (i.e., in *stepmother*)
nəx^{w}-	‘on, in, at, over (a surface), by way of’ (LOC-)
ɬəɬ-	‘partake of, eat, chew, smoke’
x^{w}- (maybe > səx^{w})	[vaguely local meaning]
x̣-	[only in x̣-č’á-ax̣an, x̣-č’ít-ayʔč ‘(the) near side’]
ʔəs-	‘one which X-es, one which is X-ed’
ʔa- (ʔə-, ʔaʔ-)	[formative]
ʔi-	[formative]

Personal prefixes

(ʔ)n-	1st person singular possessive
ʔə-	2nd person singular possessive
ʔə-...-yap	2nd person plural possessive

Suffixes (Lexical - Body)

Note: Some lexical suffixes are separated from the stem by the connective element -ay- (reduced -i-), which may or may not make a difference in meaning (see Kuipers, ¶184). The symbol "ˀ-" indicates the presence of a junctural glottal stop, which regularly surfaces at the boundary between the connective and the following suffix.

-c	'mouth'	
-cq	'chin'	
-č (also -ayˀ-č)	'back'	
-čq	'hip, side'	
-č-us	'forehead'	
-šn	'foot, leg'	
-ɬ.n-ay	'(inside of) throat'	
-q (also -ayˀ-q)	'behind, bottom, trunk'	
-qs	'nose'	
-qs-ayʔ	'elbow'	
-qʷ, -əqʷ	'head'	
-qʷuyˀ-šn	'toenail'	
-qʷuyˀ-ač	'finger'	
-wiɬ (red. -uɬ)	'belly, bowels, container, canoe'	
-apsm, -apsám	'back of neck, arm'	
-aʔn, -aʔán	'cheek, member of a pair'	
-ans	'tooth'	
-ač	'hand, arm'	
-aɬx̣a	'neck, throat'	
-alxʷcaɬ	'tongue'	
-alap	'thigh'	
-ax̣an	'side'	
-ayˀ-əqʷ (red. -iʔəqʷ)	'top, top of head'	
-ayˀ-əqʷ-šn	'knee'	
-ayˀ-am-it	'shoulder'	
-ayˀ-am-ixʷ	'breast'	
-ayˀ-aʔn (red. -ayaʔn, -ayan)	'ear'	
-ayˀ-ax̣-aʔn	'arm'	(red. -i(ʔ)áx̣aʔn, -i(ʔ)aʔx̣an)
-ayˀ-us	'eye'	
-us	'face'	
-inas	'chest'	
-iʔups	'tail'	

Suffixes (Lexical - Other)

-mut	‘separate piece, individual specimen’
-minʔ	‘half, side’ (nominalizer)
-t	‘deceased, late’
-tx^{w}	‘house’
-tn	‘implement’
-ɬal-	‘food, livelihood; breath’
-q	‘o’clock’
-qa	‘side, one of a pair; leg’
-qin (red. -qn)	‘hair; throat, language’
-was, -iwʔas, -us	‘stick, pole’
-ju-nəx^{w}	‘waves’
-ačx^{w}	‘branch, limb of tree’
-aɬ	‘times, instances’
-(a)ɬšaʔ	‘multiple of ten’
-aɬq^{w}u	‘fluid, water (used in cooking)’
-ax^{w}iɬ	‘container’ (used with numerals)
-awanəx^{w}	‘year(s)’
-aw^{ʔ}-tx^{w}	‘house’
-ayʔ (sometimes -ay)	‘bush, tree’ (nominalizer)
-ayʔ	‘to want’ (added to verb stems & followed by itr. -m)
-ay^{ʔ}-č (red. -iʔč)	‘surface, area’
-ayʔɬ (sometimes -ayɬ, -íaɬ)	‘child’
ay^{ʔ}-aqap	‘smell, taste’
-ayumʔ	‘small object’
-ay-us	‘skin, colour, animal hair, feathers, bark of tree’
-uɬ	‘belonging to, connected with’
-ulɬ	‘young specimen (human or animal)’
-ulʔa	‘(little) finger’
-uyʔs	‘large object, piece, chunk’
-iʔ (sometimes -i, -əy)	‘become, assume a state; be in a state’
-ik^{w}up	‘fire’
-iws	‘body, heart, inside’
-iwʔiɬ	‘location’

Suffixes (Formative)

-mn		-miš, məš	
-mix̣^{w}, məx̣^{w}	[in names of (groups of) people]	-talʔ, tl	
-c’	‘bones, spine’	-nač, nəč	
-nup		-č	[in numerals]
-čp		-čis	
-ɬ^1	[in numerals]	-ɬ^2	
-ɬč		-l, -ul	[diminutive ?]
-lwit		-k^w	[in some words having to do with the sea]
-x^w		-q’, əq’	
-q^{w}uy		-hm	
-yəx^w		-ya	
-yas		-yuɬ	
-a		-aʔ	
-am(ʔ)		-amyəx^w	
-amac’		-amin, amʔin, -aʔmin	
-anam, -anm		-ananʔ	
-anum		-aɬ	
-aɬn		-al	
-als		-ax^w	[in numerals]
-aq		-aq’	
-ay(ʔ)		-ay(ʔ)s	
-ayəx^w		-uʔ	
-uɬ		-uy(ʔ)	
-ic’		-ic’a, -c’a	
-it		-ič	[in numerals]
-ilš		-ix^w	
-ičn, -ačn, -əčn	‘back’ (?)	-iqn	
-iw(ʔ)			

Suffixes (Grammatical)

-tan	superlative - (in comb. w. nominalizer -s & 3poss)
-s, -s-t-	causative transitivizer (= patient suffix)
-nəx^{w}, -n-	lack of transitivizer
-(V)t	volitional transitivizer
-(V)n, -(V)n-t-	volitional transitivizer
-ši-t	oblique transitivizer
-ni-t	oblique transitivizer
-mi-n(ʔ)	oblique transitivizer
-(V)m	plain intransitivizer (= agent suffix)
-imʔ	active intransitivizer
-m	passive intransitivizer
-(a)n	1st person singular subject
-(a)x^{w}	2nd person singular subject
-as	3rd person singular subject
-(a)t	1st person plural subject
-a(ya)p	2nd person plural subject
-as-wit	3rd person plural subject
-c	1st person singular object
-mš	1st person singular (alternate) object
-umi	2nd person singular object
-umuɬ	1st person plural object
-umi-(y)ap	2nd person plural object
-wit	3rd person plural object
-s	3rd person singular possessive
-č(a)t	1st person plural possessive
-s-wit	3rd person plural possessive
-numut	reflexive (for unmarked stems & stems ending in -(V)m)
-namʔut	reflexive (for transitive stems ending in -s-t)
-sut	reflexive (for transitive stems ending in -t)
-nəwʔas	reciprocal (for unmarked stems)
-way, -ayʔ	reciprocal (for transitive stems ending in -t)

Clitics (Predicative)

Auxiliary:	č-	'to be, to act as' (precedes 1st & 2nd person subject suffixes)
Personal:	ʔan	'I'
	ʔat	'we'
	ʔax^{w}	'you (sg.)'
	ʔa(ya)p	'you (pl.)'
	ʔas	'he, she, it, they'
Deictic:	na	'there-then' (local-temporal)
	ʔi	'here-now' (local-temporal)
	k^{w}	'now, then' (temporal)
Aspectual:	wa	[continuous or iterative]
Temporal:	ʔaq', ʔit'	[future]
	t	[past]
Modal:	ʔu	'if, when' (conditional)
	q	'as if, when' (irreal)
Relative:	ɬ	'wh-' (in Eng. wh-words)
Adverbial:	ɬk^{w}un	'probably'
Directional:	nam(ʔ)	'go' (local-circumstantial)
	m(ʔ)i	'come, become' (local-circumstantial)
	x^{w}i	'appear' (circumstantial)
Emphatic:	maɬ, ʔa	
Limitative?:	mn	
(Undefined):	ya	
	k'^{w}a	'co-' (as in Eng. 'co-worker' or 'fellow worker')

Special suffixes (predicative)

Modal:	-ka	[imperative]
Adverbial	-č'	'apparently'
	-x^{w}	'still, yet'

Appendix C
Squamish Morphology

Transitivizers (Patient suffixes)[1]

-s	causative
-nəx^{w}(-), -n-	lack of control
-(V)t, -(V)n, -(V)n-t-	volitional
-ši-t, ni-t, mi-n(ʔ)	oblique

Intransitivizers (Agent suffixes)

-(V)m	plain
-imʔ	active
-m	passive

Tense, Aspect, Mood

wa	continuous/progressive actions/states (pre-clitic)
q	irrealis (pre-clitic)
ʔu	conditional (pre-clitic)
t	past time (post-clitic)
ʔaq', ʔit'	future time (post-clitic)

Person Markers

	Subject clitics	**Subject suffixes**	**Object suffixes**	**Possessive affixes**	**Personal substitutes**
1sg	čən	-(a)n	-c, -mš	(ʔ)n-	ʔəns
2sg	čəx^{w}	-(a)x^{w}	-umi	ʔə-	nəw
3sg	-----	-as	-----	-s	-----
1pl	čət	-(a)t	-umuɬ	-č(a)t	nimaɬ
2pl	čap	-a(ya)p	-umi-(y)ap	ʔə-...-yap	nəw-yap
3pl	-----	-as-wit	(-wit)	-s-wit	-----

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[1]Kuipers (1967:68) describes transitives as follows:

	Active		**Passive**
	Final	**Medial**	
/t/-form	/-(V)t/		/-(V)t-m/
/s/-form	/-s/	/-s-t-/	/-s-t-m/
/n/-form	/-(V)n/	/-(V)n-t-/	/-(V)n-t-m/
/nəx^{w}/-form	/-nəx^{w}/	/-nəx^{w}-/ /-n-/	/-n-m/

Reflexive suffixes

-numut	(added to unmarked stems and to stems ending in -(V)m)
-namʔut	(added to stems ending in causative -s-t)
-sut	(added to transitive stems ending in -t)

Reciprocal suffixes

-nəwʔas	(added to unmarked stems)
-way, -ayʔ	(added to transitive stems ending in -t)

Demonstratives

	Definite					**Indefinite**
	Present			**Non-present**		
	Weak	**Strong**		**Weak**	**Strong**	
		Proximal	**Distal**			
Unmarked	ta, ƚ’a	ti	tayʔ	kʷa	kʷəci	kʷi
Feminine	ɬa	ci	ʔaɬi	kʷɬa	kʷɬi	kʷs

Appendix D
Suffixed forms

This appendix consists for the most part of lists of examples of Squamish words containing suffixes, gleaned from Kuipers (1967, 1969). Words featuring lexical suffixes are listed in Table D1, while words with grammatical suffixes appear in Table D2. Under each suffix listed in these tables, examples in which stress surfaces on the suffix are listed in the leftmost column, while those where the suffix is unstressed are listed in the column on the right. As well, the examples listed for each suffix are informally separated in terms of vocalic content, with stems containing a full vowel preceding those containing only schwa. Thus, individual examples do not necessarily follow Kuipers' alphabetic order (see Appendix A), although the suffixes themselves are listed in that order. The appendix concludes with a general summarization of suffix stressability in Squamish.

Table D1. Squamish words containing lexical suffixes

Lexical suffixes	
Stressed	**Unstressed**
=mut 'separate piece, individual specimen' (used with numerals)	
	√k'^{w}ín=mut 'how many (different ones)?'
	√x̣aʔúcn=mut 'four pieces'
	√nč'-úʔ=mut 'one piece' (√nač', nč-)
	√qə́x̣=mut 'many (different ones)'
=minʔ 'half, side' (nominalizer)	
√ʔáy=ałq^{w}=mínʔ 'area below s.o.' (√ ?; =ałq^{w}u 'water')	
√t'əq'^{w}=mínʔ 'broken-off half'	
√səq'=mínʔ 'split-off half'	
√jəq'=mínʔ 'filings' (√be polished, sharpened)	
√q'əx̣=mín [a plant]	√c'ə́x̣=minʔ 'remains of fire'
=łn.ay '(inside of) throat' (cf. x̣^{w}úmłnał 'throat')	
√q'^{w}uc'=ł.náy-n 'choke'	
√p'əsk'^{w}=łnáy-n 'strangle' (√be squeezed)	
=łal 'food, livelihood, breath'	

Lexical suffixes	
Stressed	**Unstressed**
√qan=ɬál-m ‘steal food; eat secretly’ (√qan, qən ‘steal, cheat’; cf. qə́nʔqn ‘thief’)	
√səq^{w}=ɬál-m ‘be out of breath’	
√yəlx̣=ɬál-m ‘look for food’	
=qin ‘hair’	
√ɬíč’-l=qín ‘have one’s hair cut off’	s-√ɬíč’-l=qn ‘dog’
√ɬíč’-l=qín-m ‘cut off one’s hair’	
√x̣əyx̣=qín-m ‘war whoop’	
√ns=qín-m ‘rub oil in one’s hair’ (√nəs ‘oil’)	s-√nə́s=qn ‘hair oil’
s=√ƛ’p-ál=qn ‘feathers’ (√ƛ’əp ‘cover’)	
=q^{w}uy.ač ‘finger’	
√sínƛ’=q^{w}úyʔač ‘thumb’ (√elder children)	√sáwʔt=q^{w}uyʔač ‘little finger’ (√younger children)
	√q’^{w}x̣^{w}úy=q^{w}uyʔač ‘fingernail’ (√nail?)
	√sát=q^{w}uyač-íʔm ‘extend (give) finger (for s.o. to get hold of)’
s-√ʔə́n=wiɬ=q^{w}úyʔač ‘middle finger’ (cf. ʔə́n=wiɬ ‘be in the centre’)	√ɬəx̣^{w}=q^{w}uyʔač-íʔm ‘spit on one’s finger’
=wiɬ ‘belly, bowels, container, canoe’	
	√x̣^{w}íƛ’=wiɬ ‘be half full’
	√p’ák^{w}=(w)iɬ ‘launch a canoe’ (√float)
	p’á+√p’ak^{w}=(w)iɬ ‘play with toy canoe’ (?)
	p’í+√p’ik^{w}=(w)iɬ ‘play with toy canoe’
	√x̣^{w}íl=wiɬ-t ‘laxative’ (lit., ‘to empty the bowels’)
	√cíq=wiɬ-n ‘stab s.o. in the belly’

Lexical suffixes	
Stressed	**Unstressed**
	√ɬq^{w}í=wiɬ ‘suck blood (ab. mosquito)’ (√ ? - any relation to √q^{w}əy ‘be at lowest ebb’ ?)
	√čáʔ-t=wiɬ ‘build a canoe’ (√ča(ʔ), čəh(ʔ) ‘make’)
	√qə́q=wiɬ ‘brand-new canoe’
	s-√ʔə́c=wiɬ ‘container, canoe’ (√ʔac, ʔəc ‘interior’?)
	√pí-at=uɬ ‘go hunting in canoe’ (√pəy ‘be on water’)
	pə+√pi-át=wiɬ ‘be on hunting trip in canoe’ (√pəy)
	√ʔə́n=wiɬ ‘be in the centre’
	√ʔə́n=wiɬ-s
	s-√ʔə́n=wiɬ=q^{w}úyʔač ‘middle finger’
	s-√tam.ə́=wiɬ ‘what kind of boat?’ (√tam ‘what?’)
	√tay.ə́=wiɬ ‘race-canoe’ (√tay ‘race (in canoe)’)
s-√nəx^{w}íɬ ‘Squamish canoe’ (presumably < nəx^w=wiɬ - no root? - nəx^w- is a locative prefix)	√c’ayʔ.ə́=wiɬ=tn ‘canoe-shed’ (√c’ay ‘be sheltered’)
s-nəx^w+√nəx^{w}íɬ ‘Squamish canoes’	√x̣əyx̣.ə́=wiɬ ‘war-canoe’ (√x̣əyx̣ ‘war’)
s-ní+√nix^{w}iɬ ‘toy canoe’	√x̣əp-iʔə́=wiɬ, =uɬ (also x̣əp-iʔ=wíɬ, =uɬ) ‘large wooden platter’ (√x̣ap, x̣əp ‘wood, wooden’ ?)
=was, iwʔas, us ‘stick, pole’ (nominalizer)	
(put+)√put=íwʔas ‘oar’ (√boat)	√yáy=was ‘bed platform’
	√šíč’=us ‘harpoon for killing seals’
	q’^{w}í+√q’^{w}əl=was ‘stick for holding salmon above fire’ (√be cooked)
=yu.nəx^w ‘waves’	
√hi=(y)únəx^w ‘big waves’ (√hií, hi- ‘big, large’)	

Lexical suffixes	
Stressed	**Unstressed**
√qi=(y)únəx^w ‘bad waves’ (√qəy ‘bad’)	
=apsm ‘back of neck’	
s-√tay=ápsm ‘back of head’ (√ ?)	s’-łíč’=apsm ‘women’s modern haircut (till shoulder)’
√cíq=apsám-n ‘stab s.o. in neck’	
√p’aʔ=ápsm-n ‘grab s.o. by the neck’	
s-√cəq=ápsm ‘back of neck’ (√ ?)	
√tmł=ə́psm ‘red necked woodpecker’ (√təmł ‘red paint’)	√t’ə́lčə=psm [type of duck]
=aʔn ‘cheek, member of a pair’	
√cíq=aʔán-iʔn ‘stab s.o. in the cheek’	√cíq=aʔn ‘get one’s cheek stabbed’
	nəx^w-√miíw-aʔn ‘cheek’ (√side, edge)
	√q’^wə́l=aʔn ‘ear’
	√yə́l=aʔn ‘wing’
=ans ‘tooth, teeth’	
√smic=áns ‘gums’ (lit., ‘flesh of teeth’) (√smic ‘meat, flesh’)	√cíq=ans-n ‘poke at s.o.’s teeth’
=ač ‘hand, arm’	
	√p’íc’=ač ‘get one’s hand caught’
	√łíč’=ač ‘cut one’s hand’
	√k’^wás=ač ‘burn one’s hand’ (√be hot, burn)
	√x̣^wáy=ač ‘have a paralyzed arm’ (√become senseless, paralyzed; faint; perish)
√nax̣č=áč-iʔm ‘to signal with the hand’	s-√q^wín=ač ‘hair on hands’
√t’ak’^wus=áč ‘seven (objects)’ (cf. √t’ák’^wus ‘point, indicate’; √t’ak’^w, t’ək’^w ‘dig’)	√c’q^wúʔl=ač ‘glove’ (√ ?)
t’á+√t’ak’^wus=áč ‘seven (animals)’	s-√č’iíp=ač ‘hand’ (√č’iíp ‘be at edge or end’)

Lexical suffixes	
Stressed	**Unstressed**
√p'aʔ=áč-iʔn 'grab s.o.'s hands' (√p'iʔ (= p'ihʔ), p'aʔ (= p'əhʔ), p'əh)	√x̣ícim=ač 'have one's hand itching'
√p'aʔ=áč=iał 'take (a child) by the hand'	√mik'ʷ=ač-íʔm 'wash one's hands'
s-√č'=áč 'splinter in hand' (√č'ih, č'əh, č'a 'rise, go upward' ?)	√mik'ʷ=ač-íʔn 'wash s.o.'s hands'
√nəqʷ=áč-iʔm 'warm one's hands' (√nuqʷ, nəqʷ)	√q'áp'=ač-íʔn 'seize s.o.'s hands (with mouth or beak)' (√be seized)
√q'əwʔ=áč-iʔm 'pull in one's hand'	√x̣is=ač-íʔn.t-m 'have cramp in arm'
√c'əh=áč-iʔm 'lift up one's arm'	√qʷúl=ač-íʔm 'scoop up water with hands'
√tq=áč 'eight (objects)' (√ ?)	√t'áq'=ač 'six (objects)' (lit., 'across-hand') (√t'aq', t'əq' 'across, transverse')
√t'č=áč 'walking-staff'	t'əq'+√t'áq'=ač 'six (persons)' (√t'aq', t'əq')
√k'ʷq=áč 'have a branch hanging off (a tree)' (√k'ʷəq 'be split (ab. tree)')	ts-íʔ=ač 'have cold hands' (√təs 'cold')
√x̣əwƛ'=áč 'break one's arm'	√nəkʷ=ač-íʔm
s-√x̣ʷəc'q'ʷ=áč 'wrist' (lit., 'cut, joint of hand') (cf. s-√x̣ʷəc'q'ʷ 'joint')	√q'c-ámʔ=ač-íʔn 'put out of reach (of s.o.'s hands)' (√q'əc 'fall short, be exhausted'; √q'c-ámʔ 'fall short; faint')
s-√łaʔ+√łč=áč 'top of hand' (cf. łáʔ+√łč 'be on top')	√nə́wʔ-n=ač-t 'pay (s.o.)' (cf. √nə́wʔ-n 'put in; tr.')
=ač.xʷ 'branch, limb of tree'	
s-√t'x̣=áčxʷ 'limb of tree' (√t'əx̣ 'open, branch out')	
ʔəs-t'əx̣+√t'x̣=áčxʷ 'branchy, having many limbs'	
√q'ʷlc'=áčxʷ-m 'be bent, stunted (ab. tree)' (√ ? - maybe q'ʷəl 'be stunted' (?) & =c' 'spine')	
píʔ+√pəq'-l=áčxʷ-m 'get yellow leaves' (cf. √pəq' 'white'; cf. p'əq'ʷ+√p'íq'ʷ 'yellow (paint)')	

Lexical suffixes	
Stressed	**Unstressed**
=aɬ ‘times, instances’	
√k’ʷin=áɬ ‘how often?’	
√x̣aʔucn=áɬ ‘four times’ (√x̣aʔúcn)	
√ciač̓is=áɬ ‘five times’ (√cíač̓is)	
√x̣ʷucn=áɬ-n-cut ‘make a fourth attempt’	
√qəx̣=áɬ ‘many times, often’	
=aɬšaʔ ‘multiple of 10’	
√x̣ucn=aɬšáʔ ‘forty’	
√t’ax̣m=aɬšáʔ ‘sixty’	
√tqač̓=aɬšáʔ ‘eighty’	
√ɬəxʷ=ɬšáʔ ‘thirty’	
√ɬəq’=č̓=aɬšáʔ ‘fifty’	
√c’əkʷ=č̓=aɬšáʔ ‘seventy’ (also c’əkʷ=aɬšáʔ)	
√c’=aɬšáʔ ‘ninety’ (also c’ə=č̓=aɬšáʔ)	
=aɬqʷu ‘fluid, water (used in cooking)’	
√qʷa=áɬqʷu ‘broth’ (√qʷəh, qʷa(ʔ) ‘be perforated’ ?)	√ʔáy=aɬqʷ ‘(be on the) beach; be down below’ (√ ?; =aɬqʷu ‘water’)
√nəkʷ=áɬqʷu-n ‘stir (soup, etc.)’	√ʔáy=aɬqʷ-mínʔ ‘area below s.o.’
√č̓’xʷ=áɬqʷu-n ‘add water (to food in a cooking-pot)’ (√č̓’əxʷ ‘increase’)	
√k’ʷɬ=áɬqʷu-n ‘pour off, strain off’ (√k’ʷəɬ ‘spill; itr.’)	
=aɬ.x̣a ‘neck, throat’	
√ʔitut=áɬx̣a ‘have no appetite’ (lit., ‘sleep-throat’) (√ʔít-ut ‘to sleep; √it ‘be finished, done’)	
√cíq=aɬx̣á-n ‘stab s.o. in the throat’	

Lexical suffixes **Stressed**	**Unstressed**
√mík’^{w}=ałx̣á-m ‘wash one’s neck’	
=alap ‘thigh’	
√cíq=aláp-n ‘stab s.o. in the thigh’	√cíq=alap ‘be stabbed in the thigh’
=ax^{w}ił ‘container’	
	√náč’=ax^{w}ił ‘one (container)’ (√nač’, nč’-)
	√cíačis=ax^{w}ił ‘five (containers)’
=ax̣an ‘side’	
√cíq=ax̣án-n ‘stab s.o. in the side’	√cíq=ax̣an ‘get stabbed in the side’
s-√ʔíuʔc=áx̣an-s ‘it’s sharp edge’ (√ʔí-uʔ-c ‘sharp’; √ʔəy, ʔi- ‘good’ & =c ‘mouth, lip, edge’ (compare √qí-uʔ-c ‘blunt’; √qəy, qi- ‘bad’)x̣-√č’ít-ax̣an ‘(the) near side’	nəx^{w}-√miíw=ax̣an ‘side’
√x̣əta=áx̣an ‘(the) far side’ (√x̣ə́ta ‘far’)	(s-)√miíw=ax̣an ‘side, edge’
=aw.tx^{w} ‘house, room’ (nominalizer)	
√cam=áwʔtx^{w} ‘two houses’ (note: elsewhere he shows stress on the root)	√náč’=awʔtx^{w} ‘one house’ (√nač’, nč’-)
√čan=áwʔtx^{w} ‘three houses’ (note: elsewhere he shows stress on the root)	
s-√tam=áwʔtx^{w} ‘what kind of house?’	
s-√t’aq’-ic’=áwʔtx^{w} ‘log house’ (√t’aq’, t’əq’ ‘across, transverse’; cf. st’aq’-ic’ ‘crosswise’)	
√suk’^{w}am=áwʔtx^{w} ‘lodging made of cedar bark’ (√suk’^{w}am ‘cedar bark’ (stress unknown))	
√sil=áwʔtx^{w} ‘tent’ (√sil < Eng. ‘sail’ ?)	
√sq’iʔ=áwʔtx^{w} ‘shed for drying salmon’ (√sq’iʔ ‘dried smoked salmon, cut up thin’)	
√č’ix^{w}-im=áwʔtx^{w} ‘shed where things are dried’	
√šuk’^{w}-um=áwʔtx^{w} ‘bathhouse’	

Lexical suffixes	
Stressed	**Unstressed**
√ƛ’anq=áwʔtxʷ ‘potlatch-house’	
√ƛ’ašn=áwʔtxʷ ‘party- or dance-house’	
=awanəxʷ ‘year(s)’	
k’ʷin=awánəxʷ ‘how many years old?’	
t-x̣i+√x̣ta=áwanəxʷ ‘the year before last; last year’ (√x̣ə́ta)	t-x̣í+√x̣ta=awan-as ‘(when it is) the year after next’ (<=awanəxʷ-as)
√łəxʷ=łšaʔ=áwanəxʷ ‘thirty years old’ (< =ałšaʔ=áwanəxʷ; √lixʷ, ləxʷ ‘three’)	
=ayʔ.č ‘surface, area’	
√jəx̣ʷ=áyʔč-n ‘untie (bundle, etc.)’	(x̣-)√č’ít=ayʔč ‘shortcut; narrow stretch’
√səyq’=áyʔč ‘cross a mountain ridge’	nəxʷ-√ʔáys=ayʔč ‘go by the inside way’
√t’q’ʷ=áyʔč ‘cut across (taking the shortest way) (√t’aq’ʷ, t’əq’ʷ ‘be broken, cut’)	
=ayʔ ‘bush, tree’ (nominalizer)	
√sčiʔi=áyʔ ‘strawberry bush’ (√sčíʔi)	√kʷlúl=ayʔ ‘alder’
√c’q’ʷuʔum=áyʔ ‘blackcap bush’ (√c’q’ʷúʔum)	√c’íwq’=ayʔ ‘elderberry tree’
√łam=áyʔ ‘grass-like saltwater plant’	√qálʔq=ay ‘wild rose’
s-√tam=áyʔ ‘what kind of tree?’	√t’áqaʔ=ayʔ ‘salalberry bush’
√x̣p=áyʔ ‘cedar-tree, cedar wood’ (√x̣ap,x̣əp ‘cedar’ ?)	√qʷuʔúp=ayʔ ‘crab-apple tree’
√x̣áp=ayʔ-ay ‘young cedar’	łú+√łuq’ʷ=ayʔ ‘arbutus’ (lit., ‘tree that sheds bark’)
x̣ə́+√x̣ap=áyʔ-ay ‘young cedar growth’	ti+√tinús=tn=ayʔ ‘snakeberry bush’ (√ ?)
√č’š=áyʔ ‘Douglas fir’	c’ə+√c’ičáyʔ=ayʔ ‘spruce’ (analysis?)
√t’lm=áyʔ ‘wild cherry tree’	√x̣ʷəʔít=ayʔ ‘red hardwood’ (√x̣ʷəʔít ‘wedge’)
√q’ml=áyʔ ‘maple’ (cf. s-√q’əml ‘paddle’)	(x̣ə-)√x̣əpšín=ayʔ ‘cascara’

Lexical suffixes	
Stressed	**Unstressed**
√q’əɬm=áyʔ ‘yellow cedar’	šə́+√šəwʔ=ayʔ ‘grow all over’ (cf. √šə́wʔ=ay ‘grow’)
t’əq+√t’q=áyʔ ‘vine maple’	
qʷəɬ+√qʷɬ=áyʔ ‘driftwood; pl.’ (√qʷəl ‘drift ashore’)	
√sə́lʔy=áyʔ ‘wild grape’	
√ƛ’mq’=áyʔ ‘red hardwood’	
=ayʔ ‘want, wish’	
	√námʔ=ayʔ-m ‘want to go’
	√mʔí=ay-m ‘want to come’
	√t’íč-imʔ=ayʔ-m ‘want to swim’ (√t’íč-imʔ ‘to swim; itr.’)
	√šúk’ʷ-um=ayʔ-m ‘want to bathe’ (√šuk’ʷ ‘to bathe; itr.’)
	√t’lq’ʷímʔ=ayʔ-m ‘want to nurse’ (√t’lq’ʷ-ímʔ ‘to nurse; itr.’)
tm=áyʔ ‘want; get hungry for’ (√ ?)	ɬəɬ-√míx̣aɬ=ayʔ-m ‘want to eat bear-meat’
√həwʔ=áyʔ-m (also √həwaʔ=áy-m) ‘want to accompany’ (√hə́waʔ)	√klə́xʷ=ayʔ-m ‘want to play’ (√kləxʷ [a type of game])
=ayʔɬ ‘child’	
√šuk’ʷ=íaɬ ‘bathe one’s child’	√k’ʷáč=mixʷ=ayʔɬ ‘show, exhibit (not necessarily to children)’ (√k’ʷač ‘look’; =mixʷ ‘people’)
s-√ɬiqʷ=áyɬ ‘parent- or child-in-law after death of own child, resp. spouse’	ƛ’í+√ƛ’iʔ=ayʔɬ ‘love one’s child’ (√ƛ’i ‘dear’; cf. √ƛ’i-s ‘like, love’)
√k’ʷay=áyɬ-m ‘purify’ (√be purified)	tm-s-ɬi+√ɬác’=mixʷ=ayʔɬ ‘let people mock one(’s name)’
√lixʷ=áyʔɬ-m ‘give one’s daughter in marriage’ (lit., ‘hand down one’s child’; √put down, fall down)	nəxʷ-s-c’i+√c’áyx̣=ayɬ ‘one in the habit of rushing people’

Stressed	Unstressed
Lexical suffixes	
s-√wanim=áyɬ ‘child of deceased sibling’ (√wánim ‘orphan’)	s-qáp’+√qap’=c=ayʔɬ ‘bat’ (lit., ‘one who covers the mouth of children’ (√qap’, qəp’- ‘cover, close, shut’)
√nəkʷ=íaɬ ‘rock one’s baby’	√p’aʔ=áč=iaɬ ‘take (a child) by the hand’
nəxʷ-√niwʔ=íaɬ ‘instruct, educate one’s child’ (√niwʔ, nəwʔ, nuʔ ‘be inside, inserted’)	√x̣əh-ám=ayʔɬ ‘have one’s child crying’ (cf. √x̣əh-m ‘to cry; itr.’)
√č’əh=áyʔɬ-m ‘raise one’s child’ (√č’i(h), č’əh, č’a ‘rise, go upward’)	√t’lqʷ-ím=ayʔɬ ‘nurse one’s child’
√nəh=áyʔɬ-m ‘give a name to a person (of any age)’	s-ƛ’áx̣ʷ+√ƛ’x̣ʷ=ayʔɬ ‘young of any animal’
nəxʷ-s-wə+√wc=áyʔɬ ‘one given to teasing people’	ʔn+√ʔánʔus=ayʔɬ ‘have two children’
nč’+√nč’=áyʔɬ ‘ have one child’	čn+√čánat=ayʔɬ ‘have three children’
	ʔəp+√ʔúpn=ayʔɬ ‘have ten children’
=ay.əqʷ ‘top of head, top’	
√wiʔxʷ=íʔqʷ-m ‘go down rapids’	n-√c’áq=iʔəqʷ ‘bald’
	√cíq=iʔəqʷ ‘get stabbed on the top of the head’
	n-√q’áy=c=iʔəqʷ ‘top of head’ (√be on top)
	n-√tíq’ʷ=iʔəqʷ ‘bump the top of one’s head’
√qp’=áyʔəqʷ-s=tn ‘kneecap’ (√qap’, qəp’- ‘close, cover’)	√cíq=iʔəqʷ-án ‘stab s.o. on top of head’
√c’əp’=iʔə́qʷ ‘gr.-gr.-grandparent or child’ (√ ?)	√q’ʷúqʷ=iʔəqʷ-n ‘strike s.o. on the head’
√həkʷ=iʔə́qʷ ‘gr.-gr.-gr.-grandparent or child’ (√ ?)	√cə́xʷ=iʔəqʷ ‘get hit on the head’
=ay.am.it ‘shoulder’	
√cíq=ayʔámʔit ‘get stabbed in the shoulder’	
√ʔin=ayámʔit ‘my one (other) shoulder’ (√ʔina, ʔin- ‘the one, the other’)	
√cíq=ayʔámʔit-n ‘stab s.o. in the shoulder’	

Lexical suffixes	
Stressed	**Unstressed**
=ay.aʔn ‘ear’	
√caqʷ=áyaʔn ‘have one’s ear bleeding’	
√ciq=áyaʔn-íʔn ‘stab s.o.’s ear’	
n-s-√ʔin=áyʔaʔn ‘my one (other) ear’ (√ʔína, ʔin- ‘the one, the other’)	
√p’aʔ=áyaʔn-íʔn ‘grab s.o. by the ear’	
√tkʷ=áyaʔn ‘listen’ (√ ?)	
√tkʷ=áyaʔn-íʔm ‘listen; itr.’	
ʔəs-√qʷəh=áyaʔn ‘having pierced ears’	
√qʷəh=áyaʔn-iʔn ‘pierce s.o.’s ears’	
(tə+)√tx̣ʷ=áyaʔn-íʔm ‘make sure’ (√təx̣ʷ ‘settled’)	
=ay.aqap ‘smell, taste’	
s-√tam=áyʔaqap ‘what kind of smell, taste?’	
sú+√sum=áyʔaqap ‘stench’ (√sumʔ ‘to smell, stink’)	
√həɬ=áyʔaqap ‘good smell, taste’ (√haʔɬ, həɬ-)	
√qi=áyʔaqap ‘bad smell, taste’ (√qəy)	
=ay.ax̣.aʔn ‘arm’	
√ƛ’aqt=iáx̣aʔn ‘long-armed’ (√long (space, time))	
√x̣ʷilʔ=iáx̣aʔn ‘have one’s arm cut off’	
√xʷak’ʷi=(i)áx̣aʔn ‘have pins and needles in one’s arm’ (√xʷák’ʷi ‘get drunk’)	
ʔin+√ʔin=ayáx̣aʔn ‘thunder(bird)’ (√ʔína, ʔin- ‘the one, the other’)	
√mik’ʷ=ayáx̣an-íʔn ‘wash one’s arms’	

Lexical suffixes	
Stressed	**Unstressed**
√p’=iʔáx̣an-íʔn ‘grab s.o.’s arm’ (√p’iʔ, p’aʔ, p’əh)	
√x̣əwƛ’=iʔáx̣aʔn ‘break one’s arm’	
=ayumʔ ‘small object’	
√x̣aʔúcn=áyumʔ ‘four (pennies, marbles, etc.)’	√šiʔúk’ʷ=ayumʔ ‘small round object’ (√šiʔúk’ʷ ‘round’)
√sayam=áyumʔ ‘an unripe one (berry, etc.)’ (√sáyam ‘sour, bitter’)	
=ay.us ‘eye’	
√t’áqaʔ=áyus ‘have a black eye’ (√having the colour of a salalberry)	n-s-nəxʷ-√ʔín=ayus ‘my one (other) eye’ (√ʔína, ʔin-)
√cíq=ayús-n ‘stab s.o. in the eye’	(n-)x̣ət+√x̣ít=ʔayus ‘far-sighted; seeing at a great distance’ (√x̣ə́ta)
√ƛ’iíqʷ=ayʔús-m ‘squeeze one’s eyes tightly shut’	√xʷí=ayus ‘break through (ab. sun, moon)’ (lit., ‘show its eye’) (√xʷəy, xʷi- ‘appear, become visible’)
√čmx̣=áyus ‘have one’s eyes closed up with pitch’ (√čəmx̣ ‘pitch, resin’)	
t’əx̣+√t’x̣=áyʔus ‘have the eyes open’ (√t’əx̣ ‘open, branch out’)	
√t’x̣=áyʔus-m ‘make lightning’ (lit., ‘open the eyes (ab. the Thunderbird)’)	
√c’əh=áyus-n ‘punch s.o. in the eye’	
√čmx̣=áyus-n ‘close s.o.’s eyes up with pitch’	
=ay.us ‘skin, colour, feathers, animal hair, bark of tree’	
k’ʷí+√k’ʷs=áyus ‘burn off hairs (e.g., of a sealskin)’ (√k’ʷas ‘be warm, hot; burn, singe’)	
həɬ=áyʔus ‘of good colour, appearance’ (√haʔɬ, həɬ- ‘good’)	
√pxʷ=áyʔus ‘faded’ (√pəxʷ ‘faded, pale’)	

Lexical suffixes	
Stressed	**Unstressed**
k’^{w}í+√k’^{w}c=áyus ‘pluck, pull out (feathers)’ (cf. √k’^{w}ə́c-n ‘pluck a fowl’)	
√nəw=áyʔus-m ‘grow into tree (ab. bark)’	
=us ‘face’	
√x̣^{w}íq’^{w}=ús-n ‘hang (a person)’	√qíx̣=us ‘blind’ (√ ?)
√ɬit=ús-n	n-√q’íl=us ‘clever’ (√q’il, q’əl ‘exert mental powers’ ?)
√q’ix^{w}=ús-m ‘go against (wind, current)’	s-√číɬ=us ‘hill’ (√čiɬ ‘top’)
√č’ič’=ús-n ‘strangle’ (√be strangled; itr.)	s-√ʔác=us ‘face’ (√front side)
√qix̣=ús-n ‘wave (a weapon, stick, etc.) at s.o.’ (√sway, wave)	(s-)n-√q^{w}ú=us ‘tears’ (√q^{w}u ‘water’)
nəx^{w}-√iq’=ús-n ‘sharpen (a knife)’ (√yaq’, -iq’ ‘be sharp’)	n-s-nəx^{w}-√ʔín=us ‘my one (other) cheek’ (ʔína, ʔin-)
√q’ac’=ús-n ‘hold one’s arm around s.o.’s head’ (√be enfolded, embrace) (Note: elsewhere he shows stress on root)	n-√c’úys=us ‘crazy-faced’
√č’əsp’i=ús ‘ugly-faced’ (√č’ə́sp’i)	šu+√šáwʔ=us ‘skinny’ (√bone)
√cq=ús-m ‘look up(wards)’	√x̣íc’-im=us ‘have one’s face itching’ (√x̣ic’-im ‘to itch’)
√c’əh=ús ‘get punched in the face’	√mík’^{w}=us-m ‘wash one’s face’
√q’əw=ús-m ‘pull in one’s head’	√mík’^{w}=us-n ‘wash s.o.’s face’
√qx^{w}=ús ‘be assembled (ab. people)’ (√qəx^{w} ‘be gathered together’)	√ɬáq’^{w}=us-n ‘slap s.o.’s face’
√c’əh=ús-n ‘punch s.o. in the face’	√c’íp=us-m ‘shut one’s eyes’ (√ ?)
√qx^{w}=ús-m ‘get together’ (√qəx^{w})	√táx̣=us-n ‘cover (vertically)’
(n-)√čə́m=ús-n ‘meet; fold’	√x̣^{w}íq’^{w}=us-m ‘hang oneself’
qí+√qp’=ús-m ‘look down into the water while shading the eyes’	√p’íč’t=us-m ‘put charcoal on one’s face’ (√charcoal)
x̣^{w}ə+√x̣^{w}i=ús-n ‘tell a story to s.o.’ (√x̣^{w}əy ‘story, myth’)	(n-)√čə́m=us ‘come together, meet’ (√čəm(ʔ) ‘close, come together)

Lexical suffixes	
Stressed	**Unstressed**
√tə́mɬ=ús-m ‘paint one’s face’ (√red paint)	qə́p’+√qp’=us ‘lie facing down’
√k’ʷn≥ús-n ‘aim at’	nəxʷ-c’í+√c’xʷ=us ‘sad-looking’ (√c’əxʷ)
√q’t=ús-n ‘go around front side of’	√ɬə́m+√ɬm=c’=us ‘pock-marked’ (√ɬəm ‘chip’ ?)
=ulɬ ‘young specimen (human or animal)’	
√puš=úlɬ ‘kitten’ (√puš ‘cat’)	
s-√taqiw=úlɬ ‘colt’ (√taqíw ‘horse’)	
s-√ɬniʔ=úlɬ ‘girl’ (cf. s-ɬán-ayʔ ‘woman’; √ɬan, ɬən(ʔ) ‘weave’)	
s-√wiʔqa=úlɬ ‘boy’ (cf. s-√wíʔqa ‘man’)	
minʔ+√minʔ=úlɬ ‘young of human or animal’ (√mənʔ ‘child, offspring’)	
=uɬ ‘belonging to; connected with’	
	s-√čáy.min=uɬ ‘Chinese (adj.)’
	s-√q’íʔx̣-ya=uɬ ‘Negro (adj.)’
	s-√ʔásxʷ=uɬ ‘seal’s’
	s-√xʷalítn=uɬ ‘white man’s’
	√stəl.məxʷ=uɬ ‘Indian (adj.)’
	√siʔám=uɬ ‘chief’s’ (√siʔámʔ)
	√míx̣aɬ=uɬ ‘bear’s’ (√míx̣aɬ ‘black bear’)
=inas ‘chest’	
√ciq=ínas ‘get stabbed in the chest’	√qʷín=inas ‘be hairy-chested’
√cíq=inás-n ‘stab s.o. in the chest’	s-√ʔíl=inas ‘chest’ (√ ?)
=ikʷup ‘fire’	
tu+√táwʔ=íkʷup ‘be bright fire’	√ʔəcím=ikʷup (also √ʔəcím-ay=ikʷup) ‘be small fire’ (√ʔəcím ‘small’)

Lexical suffixes	
Stressed	**Unstressed**
√k'ʷas=íkʷup 'be hot fire'	
√hi =íkʷup 'be big fire' (√hií)	
√x̣əc-n=íkʷup 'big log around which fire is built' (√x̣ic,x̣əc 'lying down, prostrate')	
√səq'-n=íkʷup 'chop firewood' (√səq' 'to crack, split')	
=iws 'body, heart, inside'	
si+√sil=íws 'be afraid' (√ ?)	s-√qʷín=iws 'body hair'
√łč=íws 'be tired' (√ ?)	s-√qáyʔ=iws 'left side'
√q's=íws 'become impatient; get tired waiting' (√q'əs 'get tired (waiting)')	√húy=iws-m 'dress up; itr.'
√p'ł=íws 'sober up' (√p'əł 'be sober')	√húy=iws-án 'dress up; tr.'
s-√məxʷ=íws 'smallpox'	ʔes-√k'ʷáy=iws 'of ignoble descent'
txʷ-√yəh=íws-m 'point to right side'	√x̣ʷáy=iws 'become paralyzed (of whole body)'
n-s-√t'q'=íws 'side (of body)' (√t'aq', t'əq' 'across, transverse')	
nəxʷ-√nəwʔ=íws=tn 'box, container, trunk' (√niwʔ, nəwʔ, nuʔ 'be inside, inserted')	
s=√kʷn=íwʔs-m 'heartbeat' (√ ?)	
√x̣əp'k'ʷ=íws-n.t-m 'be rheumatic' (cf. √x̣əp' 'split, crack')	
s-√ʔəh=íws 'pain in body'	
√jəh=íws 'right side'	
səp+√sp=íws-n.t-m 'have a chill creep up one's back (from cold or fright)'	
=iwʔił 'location' (possible additional stress on final syllable - AHK:129)	
√łáʔłč=iwʔíł '(be) on top of' (cf. √łałč 'be on top, be high up')	√ʔáy-s=iwʔił 'be inside of' (√ʔay-s 'be inside')

Lexical suffixes	
Stressed	**Unstressed**
√lə́s=iwʔíɬ ‘(be) below’ (√ləs ‘bottom’)	√číɬ=iwʔiɬ ‘(be) above’ (√čiɬ ‘top; above’)
	√ʔína=iwʔiɬ ‘be beyond’ (√ʔína, ʔin- ‘the one, the other’)
	√ʔácq=iwʔiɬ ‘(be) outside of (something)’ (√ʔacq ‘the outdoors; outside’)
	√ʔáwʔt=iwʔiɬ ‘(be) behind (something)’ (√be behind, coming after’)
	√táyʔč=iwʔiɬ ‘(be) behind (something)’ (cf. s-√tayʔč ‘space behind’)
	√yawʔánʔ=iwʔiɬ ‘(be) before, ahead’ (√yawʔánʔ ‘first, former’)
	√ʔaɬx̣án=iwʔiɬ ‘(be) downstream of’ (√ʔaɬx̣án ‘downstream area’)
=iʔups ‘tail’	
√ciq=iʔúps-n ‘poke at (an animal’s) tail’	
√x̣iƛ’=iʔúps-n ‘cut off (an animal’s) tail’	
√p’iʔ=iʔúps-n ‘grab s.t. by the tail’	

Table D2. Squamish words containing grammatical suffixes

Grammatical suffixes Stressed	 Unstressed
-minʔ [oblique]	
	nəč+√níčim-(m)inʔ 'bawl out' (√níčim 'speak')
	√qx^w=ús-minʔ 'gang up on s.o.; tr.' (√qəx^w 'gathered'; cf. √qx^w=us 'be assembled')
	√tk^w=áyaʔn-min 'hear, listen to; tr.' (cf. √tk^w=áyaʔn 'listen to; itr.')
	√yəwʔínʔ=c-minʔ 'understand; tr.'
-nit [oblique]	
	√ƛ'í-nit 'wish for' (√ƛ'iʔ-s 'like; tr.'; √ƛ'iʔ 'dear')
	√k^{w}úɬn-nit 'borrow from' (√k^{w}úɬn 'borrow; itr.')
	√t'áyaq'-nit 'get angry at' (√t'áyaq' 'get angry')
	√ʔip'áq'^{w}aɬ-nit 'get frightened of' (√ʔip'áq'^{w}aɬ 'be afraid')
	√ʔl+ʔə́li-nit 'dream about' (√ʔl+ʔə́li 'dream; itr.')
	tx^w-√tə́ta-nit 'talk about' (tx^w-√tə́ta 'discuss; itr.')
	√yəwʔín=c-nit 'understand; tr.'
	√q'án-acut-nit (-at-sut-) 'return to' (√q'án-acut 'return')
	sə́+√slq^w-nit 'be sad about' (sə́+√slq^w 'be sad')
	q'ə+√q'x̱-át-ayʔ-nit 'argue about'
√ɬmč'-nít-m 'be caught by rain; start raining on one' (√ɬəmč' 'get chipped off')	(q'ə+√q'x̱-át-ayʔ 'argue with each other')
-šit [oblique]	
	√námʔ-šit 'take to s.o.' (√namʔ 'go'; √namʔ-s 'take, bring')

Grammatical suffixes	
Stressed	**Unstressed**
	√šát-šit 'give to s.o.' (√šat-an 'give; tr.')
	√c'ic'áp'-šit 'work for s.o.' (√c'ic'áp' 'work; itr.')
	√p'íʔ-šit 'take away from s.o.' (√p'iʔ-t 'seize, grab; tr.')
√cəx^{w}-šít 'toss s.t. at s.o.'	√x̣ə́lʔ-šit 'write for s.o.' (√x̣ə́lʔ 'write; itr.')
-iʔ [inchoative]	
(č'ə+)√č'ix^{w}-íʔ 'get dry' (√č'iʔx^{w}, č'ix^{w}-)	√q'áx^{w}-iʔ 'become callous'
(tə+)√tawʔ-íʔ 'become bright, light' (cf. tu+√táwʔ-iʔ < təw+√táwʔ-iʔ)	√wúq'^{w}-iʔ 'go downstream'
√č'ix^{w}-í=qin 'be thirsty' (lit., 'have one's throat be dry')	(qə+)√qlím-iʔ 'become weak'
√tawʔ-íʔ-nit-m 'be caught by bright light'	q'əx^{w}+√q'áx^{w}-iʔ 'become very callous'
(p'ə+)√p's-íʔ 'to land, go to shore' (√p'əs)	(tay+)√táyʔaq-iʔ 'move (from one place to another)'
pə+√px^{w}-íʔ 'be fading, getting pale' (√pəx^{w})	t'í+√tiq^{w}-iʔ 'be getting cold'
tə+√ts-íʔ 'feel cold' (√təs)	t'í+√t'ix^{w}-iʔ 'be descending from a hill'
sə+√sp-íʔ 'become stiff' (√səp)	q'á+√q'ax^{w}-iʔ 'gradually become callous'
ƛ'ə+√ƛ'q'^{w}-íʔ 'be getting dark' (√ƛ'əq'^{w})	wú+√wuq'^{w}-iʔ 'be going downstream'
(x̣^{w}ə+)√x̣^{w}s-íʔ 'get fat' (√x̣^{w}əs)	√t'íq^{w}-iʔ-nit-m 'be caught by cold weather'
√ƛ'q'^{w}-íʔ-nit-m 'be caught by darkness'	
-tan [superlative]	
s-√qi-tán-s(-wit) 'the worst of them' (√qəy, qi-)	s-√háʔɬ-tan-s(-wit) 'the best of them' (√haʔɬ, həɬ- 'good')
	s-√(h)ií-tan-s(-wit) 'the biggest of them' (√hií 'big, large')
	s-√ʔəcím-tan-s(-wit) 'the smallest of them' (√ʔəcím 'small, little')
-sut [reflexive]	

Grammatical suffixes	
Stressed	**Unstressed**
	√míkʼʷ-in-cut (<-in.t-sut) ‘wash oneself’
	√x̣íq’-in-cut ‘scratch oneself’
	√qʷáy-an-cut ‘mount, ride on horseback’ (√be on top)
	√sín-icut (<-it-sut) ‘move over’
	√híl-icut (<-it-sut) ‘roll’
	√níkʷ-icut (<-it-sut) ‘swing’
	√t’ám-acut (<-at-sut) ‘be leery, on one’s guard’ (√t’am(ʔ), t’əm)
	√p’ákʷ-ancut (<-an.t-sut) ‘come to surface of water’
	√máƛ’-n-cut (<-n.t-sut) ‘make oneself dirty’ (√maƛ’, məƛ’)
	√míƛ’-in-cut (<-in.t-sut) ‘to stoop’
	√šám-anʔ-cut (<-an.t-sut) ‘come to surface of water’
	√láp’-n-cut (<-n.t-sut) ‘be warped’
	√c’ap’-an-cut ‘slow down (in working)’
	√q’ʷáyʔ-acut ‘change to being friendly (after anger)’
	√híč-icut ‘brag, boast’
	√wáy-acut ‘reveal about oneself’
	√t’úyʔt-n-cut (<n.t-sut) ‘take medicine’
	√k’ʷəc’+√k’ʷúc’-un-cut (<-un.t-sut) ‘zigzag’
	√k’ʷə́laš-cut (<-t-sut ?) ‘shoot oneself’
	√kʷí-in-cut (<-in.t-sut) ‘do, accomplish’
	kʷə+√kʷi≥ínʔ-cut (<-inʔ.t-sut)
	q’an+√q’án-acut ‘walk back and forth’
	t-√q’án-acut ‘return’

Grammatical suffixes	
Stressed	**Unstressed**
	t-q’á+√q’an≥ácut ‘be returning the way one has come’
	√cam≥ánʔ-cut (<-anʔ.t-sut) ‘make a second attempt’
	√sič’-án-cut (<-an.t-sut) ‘move around (s.t.)’
	√x̣ʷiaq’ʷ-án-cut ‘work one’s way through’
	√c’á-n-cut ‘thunder’ (√c’əh)
	√ʔə́qʷ-n-cut ‘moult’ (√fall out (ab. hair)’)
	√qms-án-cut ‘pack one’s belongings’
	√ʔəcq’-ánʔ-cut ‘throb’
	pə+√pt-ícut ‘have a match, competition’
	c’ə+√c’xʷ-ícut ‘plead, beg’
	√šq-əcut ‘finish, get ready’
	√mət-ə́cut ‘bend, give way (e.g., plank under some weight)’ (√supple, pliable)
	tm-s-√q’ʷš-ə́cut ‘make a plaything of’
	√yə́w-cut (<-t-sut) ‘brag (= praise oneself)’
	√ʔə́n.micut (<...t-sut) ‘commit suicide’
-nəwʔas [reciprocal]	
√p’íɬq’-nəwʔás-n ‘put side by side’	√k’ʷáč-nəwʔas ‘see each other’
√t’áq’-nəwʔás-n ‘to cross (two things)’ (√t’aq’, t’əq’ ‘across’)	√č’áw-nəwʔas ‘be of assistance to each other’
√mál=qʷ-nəwʔás-n ‘mix; tr.’	√t’íq’ʷ-nəwʔas ‘bump into each other (accidentally); itr.’ (√bump; run aground)
√x̣ʷiɬʔ-nəwʔás-n ‘take apart’ (√come off, out)	√ƛ’í-nəwʔas ‘have a liking for each other’ (√ƛ’i ‘dear’; √ƛ’i-‘like, love’)
	√šmá(n)-nəwʔas ‘get into a fight with each other’ (√šman ‘enemy’)

Grammatical suffixes	
Stressed	**Unstressed**
	nəč’+√náč’-nəwʔas ‘differ from each other’
	šə+√šmʔán-m-nəwʔas ‘be enemies’ (√šman ‘enemy’)
	√mál=q^{w}-nəwʔas ‘be mixed up’ (√mil, mal ‘be mixed up’; =q^{w} ‘head’)
	tx^{w}-√nčəʔámʔ-nəwʔas ‘be how (related) to each other?’ (√ʔə́nča [interrogative substitute]; cf. tx^{w}-√nčəʔ-ámʔ ‘be how? be how much?’)
	√čə́mʔ=us-nəwʔas ‘be of assistance to each other’ (√čə́mʔ, √čə́mʔ=us ‘meet’)
	√qə́x^{w}-nəwas ‘gather together; itr.’ (√be gathered together)
√q’^{w}úʔ-nəwʔás-n ‘join together; gather’	√q’^{w}úʔ-nəwʔas (also √q’ə́wʔ-nəwʔas) ‘meet, get together’ (√q’aw(ʔ), q’əw(ʔ), q’^{w}uʔ ‘side’)
√ɬa-nəwʔás-n ‘pile up’ (√ɬəhʔ, ɬa(ʔ) ‘be touched’)	ʔəs-t’á+√t’q’-nəwʔas ‘lie across each other’ (√t’aq’, t’əq’ ‘across, transverse’)
√mə́s-nəwʔás-n ‘stick together, adhere; tr.’	√mə́s-nəwʔas ‘stick together, adhere; itr.’ (√məs ‘stick on, be stuck to’)
-numut [reflexive]	
	√ʔíl-numut ‘get a chance to eat’
	√q’^{w}úq^{w}-numut ‘strike oneself accidentally’
	√k’^{w}áč=us-numut ‘see one’s own face’
	√šúk’^{w}-um-numut ‘get a chance to take a bath’
	√c’i+√c’áp’-numut ‘get a chance to work’
	√ʔít-ut -numut ‘get a chance to sleep’
	√k^{w}ə́laš-numut ‘shoot oneself accidentally; get a chance to shoot’
	√t’áyaq’-numut ‘get angry’
q^{w}a-númut ‘escape’ (lit., ‘get through’) (√q^{w}əh ‘porforate’)	√tə́l-numut ‘to realize s.t.’

Grammatical suffixes	
Stressed	**Unstressed**
-wayʔ, -ayʔ [reciprocal]	
	√tác-anʔ.t-way ‘stroke each other’
	√cíq-inʔ.t-way ‘poke, stab each other’
	c’áp-n.t-way ‘punch each other’
	nəx^{w}-√ʔáyʔ-s.t-way ‘exchange (with each other)’
	č’ə+√č’əw-át-ayʔ ‘help each other’ (√č’aw)
	ƛ’íʔ-s.t-way ‘love each other’ (lit., ‘cause each other to be dear’)
	√č’ə́mʔ-t-way ‘bite each other’
	√səq-mín.t-way ‘split and share’
	q’ə+√q’x̣-át-ayʔ ‘argue with each other’ (√ ?)

Summary of Suffix Stressability

Stressable Suffixes

Stressable Suffixes (if polysyllabic, no particular syllable stressed)

=minʔ ‘half, side’ (nominalizer)
=ɬnay ‘(inside of) throat’
=ɬal ‘food, livelihood, breath’
=qin ‘hair’
=apsam, =apsm, =psm ‘back of neck’
=ans ‘tooth, teeth’
=ač ‘hand, arm’
=ačx^{w} ‘branch, limb of tree’
=aɬx̣a ‘neck, throat’
=alap ‘thigh’
=ax̣an ‘side’
=awtx^{w} ‘house, room’ (nominalizer)
=awanəx^{w} ‘year(s)’
=ayʔ ‘bush, tree’ (nominalizer) - some anomalies
=ayʔ ‘want, wish’
=ayʔč ‘surface, area’
=ayʔɬ, =íaɬ ‘child’
=ayʔəq^{w} ‘head, top’ - stressed only in anomalies (otherwise doesn’t seem stressable)
=ayamʔit ‘shoulder’ (insufficient data to tell if it’s always stressed on 2nd syllable)
=ayus ‘eye’
=ayus ‘skin, colour, feathers, animal hair, bark of tree’ (only seen with weak roots)
=us ‘face’
=inas ‘chest’
-tan [superlative]
-iʔ [inchoative]

Stressable on particular syllable only (but not necessarily stressed)

=q^{w}úyač ‘finger’
=áɬq^{w}u ‘fluid, water (used in cooking)’
=áyumʔ ‘small object’
=aʔán-, =aʔn ‘cheek, member of a pair’
=ík^{w}up ‘fire’ - some anomalies
=íwʔas (also =was, =us) ‘stick, pole’ (nominalizer)
=iwʔíɬ ‘location’

=iʔúps ‘tail’ - insufficient evidence
-nəwʔás [reciprocal]
-númut [reflexive]

Stressable on particular syllable only (if polysyllabic) and always stressed
=q^{w}úyač ‘finger’
=yúnəx^{w} ‘waves’
=áɬ ‘times, instances’
=aɬšáʔ ‘multiple of 10’
=áɬq^{w}u ‘fluid, water (used in cooking)’
=áyaʔn ‘ear’
=áyʔaqap ‘smell, taste’
=ayáx̣aʔn ‘arm’
=áyumʔ ‘small object’
=úlɬ ‘young specimen (human or animal)’
=íwʔas (also =was, =us) ‘stick, pole’ (nominalizer)

Suffixes never stressed on final syllable of word
=ɬnay ‘(inside of) throat’ (insufficient data)
=ɬal ‘food, livelihood, breath’ (insufficient data)
=apsam, =apsm, =psm ‘back of neck’
=aɬx̣a ‘neck, throat’
=alap ‘thigh’ (insufficient data)
=ax̣an ‘side’
=awanəx^{w} ‘year(s)’
=ayʔəq^{w} ‘head, top’ - final syllable stressed only in 2 anomalies
=ayamʔit ‘shoulder’
=ayus ‘eye’
=ayus ‘skin, colour, feathers, animal hair, bark of tree’
=inas ‘chest’
=ik^{w}up ‘fire’
=iʔups ‘tail’ - insufficient evidence
-tan [superlative] - insufficient evidence (never appears in final position)
-nəwʔas [reciprocal]
-numut [reflexive]

Suffixes that can be stressed word-finally
=minʔ ‘half, side’
=qin ‘hair’
=ans ‘tooth, teeth’ (cf. √smic=áns ‘gums; lit., flesh of the teeth’)
=awtx^{w} ‘house, room’ (nominalizer)
=ayʔ ‘bush, tree’ (nominalizer) - some anomalies noted
=ayʔɬ, =íaɬ ‘child’ - only in 2 cases as =ayɬ; otherwise =íaɬ when stressed (so non-final)
=iʔəq^{w} ‘head, top’ - only in anomalies
=iwʔíɬ ‘location’

With weak root
=ač ‘hand, arm’
=ačx^{w} ‘branch, limb of tree’
=ayʔ ‘want, wish’
=ayʔč ‘surface, area’
=us ‘face’ (also č’əsp’iús < √č’ə́sp’i=us)

-iʔ [inchoative] - some anomalies

Unstressable suffixes

=mut ‘separate piece, individual specimen’ (used with numerals)
=wiɬ ‘belly, bowels, container, canoe’
=ax^{w}iɬ ‘container’ (insufficient data)
=ayʔəq^{w} ‘head, top’ (some anomalies)
=uɬ ‘belonging to; connected with’ (insufficient data?)

-minʔ [oblique]
-nəx^{w} [transitive]
-nit [oblique]
-šit [oblique]
-sut [reflexive]
-namʔut [reflexive]
-way [reciprocal]

Appendix E
List of Constraints

This appendix contains a list of the OT constraints utilized (or referred to) in this dissertation. Individual constraints are listed in the order of appearance in the text, and page numbers (included in parentheses) denote first reference to a particular constraint.

C-FINAL-ROOT (71): Align-R [Root, C].
FTBIN-σ (83): Feet consist of binary syllables.
FTFORM=TROCHEE (83): Feet are trochaic, or left-headed.
PARSE-σ (83): Syllables are parsed by feet, else by the prosodic word.
NONFINALITY (83): The final syllable in a prosodic word is unstressed.
*FT(ə) (87): Schwa-headed syllables have no metrical projection.
WEIGHT-TO-STRESS PRINCIPLE (WSP) (90): If heavy, then stressed.
WSP′ (91): If weight, then stressed.
ALIGN-RT-FT [Align (Root, R, Foot, R)] (103): The right edge of every root coincides with the right edge of some foot.
*CLASH (122): Adjacent syllables are not stressed.
WBYP (WEIGHT-BY-POSITION) (123): Coda consonants are moraic.
*μ/K (126): Obstruents are not moraic.
*μ/R (126): Resonant consonants are not moraic.
ONSET (129): Syllables must have onsets.
CODA-R (143): Word-internal resonants are parsed as codas.
NOCODA (144): Syllables do not have codas.
ALIGN-WD-ST [Align (PrW, L, PStem, L)] (167): The left edge of every prosodic word coincides with the left edge of some prosodic stem.
ALIGN-RT-ST [Align (PRoot, L, PStem, L)] (167): The left edge of every prosodic root coincides with the left edge of some prosodic stem.
ALIGN-WD-FT [Align (PWord, L, Foot, L)] (167, 195): The left edge of every prosodic word coincides with the left edge of some foot.
ALIGN-L (ROOT, PS) (167): Align the left edge of the root with the left edge of the Prosodic Stem.
RED_1=ROOT (180): Reduplicants of type RED_1 (that is, CVC- reduplicants) belong to the morphological category ROOT.
ROOT=FOOT (186): A root is equal to a foot.
FTBIN-μ (189): Feet consist of binary moras.
ALIGNR-WD-FT [Align (PWord, R, Foot, R)] (195): The right edge of every prosodic word coincides with the right edge of some foot.
ALIGNL-WD-FT [Align (PWord, L, Foot, L)] (195): The left edge of every prosodic word coincides with the left edge of some foot.
LEFTMOST (198): The head foot of a prosodic word is situated at the left edge of the prosodic word.
RED_2=AFFIX (202): Reduplicants of type RED_2 (that is, CV- reduplicants) belong to the morphological category AFFIX.
AFFIX=SYLL (202): An affix is a syllable.

ALIGN-[RED]$_{AF}$ [Align ([RED]$_{Af}$, Left, PRoot, Left)] (203): The left edge of every CV-reduplicant coincides with the left edge of some PRoot.

DEP-NUC (232): A nucleus in the output must also be present in the input.

HEAD-MAX (240): If $\alpha \in S_1$ is a prosodic head in a word and $\alpha \Re \beta$, then β is a prosodic head.

ROOTFAITH >> AFFIXFAITH (255): Faithfulness to lexical accent in roots is valued over that in affixes.

FAITH(HEAD) [HEADFAITH(LA)] (261): A lexical accent sponsored by a morphological head in the input has a correspondent in the output (HEADMAX(LA)); furthermore, a lexical accent hosted by a morphological head in the output has a correspondent in the input HEADDEP(LA)).

HEADFAITH(HEAD) (261): Faithfulness to lexical accent in the head morpheme is valued over that in non-head morphemes.

HEADSTRESS (261): Morphological heads are stressed.

IO-IDENT [Ident[VF]-IO] (293): Corresponding vowels in the input and output have identical place features.

RTSFX-IDENT [Ident[VF]-RtSfx] (293): Corresponding vowels in the root and control suffix have identical place features if contained within a single prosodic foot.

IO-IDENT(ROOT) [Ident[VF]-IO(Root)] (294): Corresponding vowels in the input and output forms of a root morpheme have identical place features.

IO-IDENT(AFFIX) [Ident[VF]-IO(Affix)] (294): Corresponding vowels in the input and output forms of an affix have identical place features.

MAX-NUC (296): A nucleus in the input must also be present in the output.