A Preliminary Account of Stress in SENĆOŦEN[*] (Saanich/North Straits Salish)

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The purpose of this paper is to contribute to our understanding of how stress is assigned in SENĆOŦEN. The stress system of Salish languages has been traditionally thought of as highly morpho-lexical. Montler (1986:23) states that in SENĆOŦEN, roots and affixes are lexically specified for their stress properties. However, in this paper I claim that stress assignment in SENĆOŦEN is more predictable than previously thought. The stress pattern of a high number of polymorphemic words, namely those that contain lexical suffixes, can be accounted for phonologically. Using an Optimality Theory analysis, it is possible to show that a weight distinction between full vowels and schwa coupled with a right aligned trochaic foot determines stress placement in SENĆOŦEN. I also examine the phonotactics which prevent certain consonant clusters from occurring. However, I do not claim to answer all the questions surrounding SENĆOŦEN schwa and stress, but instead hope to offer a potentially fruitful direction for future research into the stress system of SENĆOŦEN.

KEYWORDS: SENĆOŦEN, Saanich, Salish, Stress, Phonology, Schwa

1. Introduction.

In this paper, a revised version of my M.A. Thesis (Leonard 2006), I offer a first attempt at formalizing stress in SENĆOŦEN. My central claim is that stress in SENĆOŦEN lexical stems[1] is more predictable than previously thought. I formalize this claim using an Optimality Theory analysis, which draws upon a combination of constraints used by Dyck (2004), in her analysis of the stress system of S<u>k</u>w<u>x</u>wú7mesh (Squamish), and Kiyota (2003), in his analysis of plural allomorphy in SENĆOŦEN (Saanich). I focus on three types of lexical stems in this analysis. Plain roots, root and lexical suffix combinations, and root and lexical suffix combinations with the addition of a grammatical morpheme. The inclusion of this type of grammatical morphology serves to illuminate the stress properties of the lexical suffixes in question. I further contribute to our knowledge of SENĆOŦEN by examining the phonotactics which prevent certain consonant clusters from occurring. In this paper, I do not claim to answer all the questions surrounding SENĆOŦEN schwa and stress, but instead hope to offer a

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[1] Lexical stems consist of a root and lexical suffix.

potentially fruitful direction for future research.

To truly understand the entire stress system of SENĆOŦEN, it will be necessary to build on the work presented here and to examine forms which include more complex morphology, including transitivity morphology, person markers, reduplication in its various forms, particles and clitics. I will be pursuing this line of research in future papers. The analysis presented in this paper provides the crucial foundation for a complete study of SENĆOŦEN stress.

At first glance, the data suggest that stress in SENĆOŦEN is unpredictable.[2]

(1)	a.	[v́ v]	SȻOTI	skʷáti	*crazy, insane*
	b.	[v v́]	TI,TOS	tiʔtás	*bucking tide*
	c.	[v́ ə]	SḴÁLEX	sqéləx̌	*clam fork*[3]
	d.	[ə v́]	SḴELÁU,	sqəléw’	*beaver*
	e.	[ə́ v]	ŦEḴI	θə́qi	*sockeye*
	f.	[ə́ ə]	ḴELEX̱	qə́ləx̌	*salmon eggs*

In words with two full vowels, stress can occur on either the first or the second full vowel. Words with a full vowel and schwa can have stress on either the full vowel or the schwa, while words with two schwas have stress on the first schwa.

With the exception of a few pages dedicated to the subject in Montler (1986:23–27), only one work has been produced that proposes a formal analysis of stress in SENĆOŦEN. Kiyota (2003:20–28) uses Optimality Theory to account for the stress properties of the SENĆOŦEN plural. Both Montler (1986:23) and Kiyota (2003:7) agree that stress has a tendency to be penultimate and a full vowel is stressed over a schwa. They also state that stress in SENĆOŦEN is morphologically complex, whereby roots and suffixes, both of which are lexically specified for stress, compete with one another for primary word stress. In this paper, I support both Montler (1986:23) and Kiyota (2003:7) in their first claim, that stress tends to be penultimate. However, my research does not support their second claim, that stress in SENĆOŦEN is a morphologically complex system. Instead, I argue that the stress pattern of many SENĆOŦEN lexical stems can be accounted for by assuming that left-headed binary feet are aligned to the right edge of a lexical stem and that SENĆOŦEN is sensitive to the phonological weight distinction between full vowel and schwa.

This section is organized as follows: in 1.1, I situate the SENĆOŦEN language within the larger Salish language family. In 1.2, I present the phonemic inventory of the language. In 1.3, I discuss previous literature about stress in the Salish languages. In 1.4, I explain where the data for this paper come from and how this data are being used. In 1.5, I outline the main tenets of Optimality Theory, and in 1.6, I provide an outline of the remainder of the paper.

[2] 1SUBJ=1st person subject; ACT=actual; CONN=connector; CTR=control transitive; DET=determiner; INST=instrumental; LOC=locative; LS=lexical suffix; MID=middle; PART=particle; RED=reduplication S=nominalizer.

[3] I am using Nuu'2 font where ƚ = ł.

1.1. SENĆOŦEN.

SENĆOŦEN is a dialect of North Straits, a Central Coast Salish language, spoken by the Saanich people, who live on the Saanich Peninsula and the surrounding Gulf and San-Juan Islands (Montler 1986:1, Elliott 1983:13). Other dialects of North Straits Salish are: Sooke Songish, Samish, Semiahmoo and Lummi. The Salish language family is comprised of 23 languages spoken throughout the Pacific Northwest. These languages are divided into five subdivisions (Czaykowska-Higgins and Kinkade 1998:3).

(2) The Salish languages (Czaykowska-Higgins and Kinkade 1998:3)

	Non-Indigenous name	**Indigenous name (phonetic)**	**Indigenous name (orthographic)**
I	Bella Coola	nuxalk	
II	Central Salish		
	Comox		
	Pentlatch	pənƛ̕áč	
	Sechelt	šášíšáɬəm	Shashishalhem
	Squamish	sqʷx̌ʷúʔməš	S<u>k</u>w<u>x</u>wú7mesh
	Halkomelem		
	Northern Straits		
	Klallam	nəxʷsƛ̕áy̓əm̓ucən	
	Nooksack	ɬə́čələsəm	
	Lushootseed	dxʷləšúcid	
	Twana	sqʷuqʷúʔbəšq	
III	Tsamosan		
	Quinault	kʷínayɬ	
	Lower Chehalis	ɬəw̓ál̓məš	
	Upper Chehalis	q̓ʷay̓áyiɬq̓	
	Cowlitz	sƛ̕púlmš	
IV	Tillamook	hutyéyu	
V	Interior Salish		
	Lillooet	sƛ̕ǽƛ̕imxəč	St'át'imcets
	Thompson	nɬeʔkepmxcín	Nlaka'pamux
	Shuswap	səxwəpməxcín	Secwepemctsín
	Colville-Okanangan	nsilxcín	
	Columbian	nxaʔamxcín	
	Spokane-Kalispel-Flathead		
	Coeur d'Alene	snčícuʔumšcn	Snchitsu'umshtsn

The Salish language family covers an extensive geographical area in the Pacific Northwest. The areas include, southern British Columbia, Washington State, northern Idaho, western Montana and northwestern Oregon (see Czaykowska-Higgins and Kinkade 1998:2 for a detailed map). Pentlatch, Nooksack, Twana and Tillamook are no longer spoken. The remainder of the Salish languages are considered to be critically endangered. Of the six dialects of North Straits, only SENĆOŦEN and Samish are still spoken by fluent speakers. The number of speakers is unclear, but my consultants have suggested that about twenty five people speak SENĆOŦEN to varying degrees of fluency. All these speakers are over the age of 50. In some cases the languages do not have an indigenous name. These include Comox, Northern Straits, Halkomelem and Spokane-Kalispel-Flathead.[4] As I have explained above, SENĆOŦEN (sənčáθən) is a dialect of Northern Straits Salish.

1.2. Inventory of sounds.

As in the other Salish languages, the consonant inventory of SENĆOŦEN is extensive, with a total of 36 contrastive segments.

(3) SENĆOŦEN consonant inventory (adapted from Montler 1986:7)[5]

	Labial	**Coronal**				**Dorsal**				**Glottal**
	bilabial	**dental**	**alveolar**	**lateral**	**post alveolar**	**velar**		**uvular**		**glottal**
Obstruents	p P		t T		č Ć	(k) (C)	k^w Ȼ	q Ḵ	q^w Ḱ	
	p̓ B	t̓$^{\theta}$ Ꞇ	t̓ D	ƛ̓ Ṯ	č̓ J		k̓^{w} Q	q̓ K	q̓^{w} Ꝁ	ʔ ,
		θ Ŧ	s S	ɬ Ł	š Ś		x^w W̱	x̌ X̱	x̌^{w} X̱	h H
Resonants	m M m̓		n N n̓	l L l̓	y Y y̓		w W w̓	ŋ Ṉ ŋ’		

There are two orthographies used in (3). In 1981, Dave Elliott Sr, a Saanich Elder, developed his own orthography for SENĆOŦEN (Elliott 1983). In the right hand column of each cell is the Dave Elliott orthography and in the left hand column is the American Phonetic Alphabet.

The inventory of consonants in (3) is typical of the Salish languages. SENĆOŦEN has a series of voiceless obstruents and all the stops have ejective counterparts. There are no voiced obstruents in SENĆOŦEN. Many Salish languages do not distinguish between non-labial velar and palato-alveolar obstruents (Czaykowska-Higgins and Kinkade 1998:8–9). This is also true for SENĆOŦEN, as is attested by the presence of a non-labial palato-alveolar, but not a non-labial velar fricative. In his phonemic inventory, Montler (1986) includes the phoneme /k/ within the set of velar stops. However, he places it within parentheses as its occurrence in the lexicon is rare, and limited mostly to loanwords. As in the other Central Salish languages, the

4 The linguistic classifications do not reflect any overall political or social division. Each language contains dialects with their own indigenous names (Czaykowska-Higgins & Kinkade 1998:4).

5 I follow a convention in the Salish literature by using the Americanist phonetic alphabet. An appendix is included at the end of the thesis with the equivalent symbols from the International Phonetic Alphabet.

SENĆOŦEN consonant inventory lacks pharyngeals, retracted consonants, flaps or trills.

The resonant consonants in SENĆOŦEN are, for the most part, typical of the Salish languages. The segments found in the resonant series generally correspond in place of articulation to those in its obstruent series, and every resonant has a glottalized counterpart. Unlike other non-Interior Salishan languages, the SENĆOŦEN inventory includes uvular resonants. This segment is found only in Straits and Northern Straits Salish and is the result of a historical change from /m/ to /ŋ/[6] (Kuipers 2002).

The vowel system, typical of the Salish languages, consists of four vowels and a schwa. In (4), I present only those sounds I consider to be phonemes. The Dave Elliott orthography also includes segments which are phonetic and those that are combinations of a vowel and a glide. These sounds are: A [æ], Ꞻ́ [ey], Í [əy].

(4) SENĆOŦEN vowel inventory (adapted from Montler (1986:7)

	Front	**Central**	**Back**
High	i I		u U
Mid	e Á	(ə) (E)	
Low		a O	

In contrast to the extensive consonant inventory, SENĆOŦEN, like the majority of Salish languages, has a minimal vowel inventory. It consists of only four full vowels. / i, e, u, a/, and a schwa. Of the four full vowels of SENĆOŦEN, /u/ is found less frequently in the lexicon than either /i/, /e/ or /a/. As is the case with other Salish languages, /u/ tends to occur only in loanwords, or as a syllabic variant of /w/ (Czaykowska-Higgins and Kinkade 1998:10)

A number of Salishanists have investigated the status of schwa in Salish languages (see Kinkade 1998a on Salish languages in general; Carlson 1989 on Spokane; Czaykowska-Higgins 1993 and Czaykowska-Higgins and Willett 1997 on Moses-Columbian; Bianco 1995 and Urbanczyk 2000 on Lushootseed; Bianco 1996 on Cowichan; Shaw et al. 1999 on Musqueam; Blake 2000b on Sliammon; Dyck 2004 on Sḵwx̱wú7mesh (Squamish)). They all point to the conclusion that schwa is largely predictable in Salish. In this paper, I show that schwa can be predicted in many SENĆOŦEN forms. Often it is used to break up an illicit consonant cluster, or is the reduction of an unstressed full vowel. Of course there are instances where schwa can not be predicted an area which I leave for future research.

1.3. The study of stress in Salish languages.

Czaykowska-Higgins and Kinkade (1998:15–17) report the presence of four basic types of stress systems in the Salish language family. The first type is a morphologically

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[6] Montler (1986:19) uses the velar symbol for this sound but refers to these segments as uvulars.

governed stress system. Roots and suffixes are considered to be accented and compete with each other for stress assignment. The Interior languages, with the exception of St'át'imcets (Lillooet), fall into this type. In these types of languages, primary stress tends to fall as far to the right as possible in a word, given the lexically specified stress properties of the component morphemes (see Czaykowska-Higgins 1993 on Moses Columbian, Bates and Carlson 1989 on Spokane, Thompson and Thompson 1992 on Thompson).

The second type of stress system is found in languages such as St'át'imcets (Lillooet) (see Roberts 1993, Roberts and Shaw 1994, Matthewson 1994, Van Eijk 1985) and Sḵwx̱wú7mesh (Squamish) (see Davis 1984, Demers and Horn 1978, Dyck 2004, Watt 1999). These languages tend to assign primary stress to the penultimate syllable and are governed by weight restrictions and to a lesser extent by morphological restrictions.

The third type of stress system reported by Czaykowska-Higgins and Kinkade (1998) is found in Saanich. Who, following Montler (1986:23), say that primary stress in this language tends to be penultimate and subject to morphological stress properties, but not to weight restrictions. However, as I will show in section 3, the stress pattern of Saanich (SENĆOŦEN) roots suggests that the language patterns more closely with the second stress type. The stress pattern depends, to a great degree, on the weight difference between full vowels and schwa.

The fourth type of stress system is termed a fixed system. In Sliammon, primary stress always falls on the initial syllable (see Blake 2000b, Watanabe 2003) and in Northern Lushootseed, stress surfaces on the first, non prefixal, full vowel in the word. If all the syllables contain schwa, then the leftmost one will bear the stress (see Bianco 1995, Hess 1977, Urbanczyk 2000).

Czaykowska-Higgins and Kinkade (1998:14) discuss some general tendencies of the stress systems of Salish languages. First, they point out that for most of the languages there are three degrees of stress: primary, secondary and unstressed. Second, they report that secondary stress does not surface reliably and that most words only have a primary stress. It is unclear whether secondary stress is difficult to perceive, or if it has not been adequately noted by linguists. In my own fieldwork, I had difficulty perceiving secondary stress.[7]

Third, Czaykowska-Higgins and Kinkade (1998:14) say that the acoustic correlates of stress, for most of the Salish languages, are pitch and length. After conducting a brief phonetic analysis of stress in three words, I concluded that this was also the case in SENĆOŦEN. I found that intensity was not a reliable correlate of stress. This is because an unstressed schwa next to a resonant can have equal or higher intensity than a stressed vowel. For the example in (5a,b) the stressed vowel has higher values for pitch, length and intensity than the unstressed vowel. In (5c), however, the stressed vowel has higher values for pitch and length, but a lower value for intensity than the unstressed vowel. It is likely that the sonority difference between the plain and glottalized resonants in (5c) is responsible for the different levels of intensity present in the two syllables of this word.

[7] In this paper, I only deal with primary stress. I assume, following Kiyota (2003:9), that secondary stress is accounted for by iterative footing from the right edge of a word.

(5) a. ȾOȾEN θáθən *mouth*
b. SḴOṈI sq̓ʷáŋiʔ *head*
c. DEM,SEN t̓ə́m̓sən *He got hit on the foot.*

In (6), I show the values for the acoustic correlates of stress, for both the stressed and the unstressed vowels in the examples in (5). To obtain these numbers, I analyzed recordings of the SENĆOȾEN words in Praat 4.1.1 (Boersma 2001. Praat is a computer program with which phoneticians can analyze, synthesize and manipulate speech, and create high-quality pictures for their articles and thesis. Using Praat, I highlighted the relevant syllable and used the query function to obtain the mean pitch, intensity and duration of each segment under study. From the findings of this brief analysis, I hypothesize that the stress correlates for SENĆOȾEN are likely pitch and length. The findings in (6) by no means constitute an extensive acoustic study of stress in SENĆOȾEN. I leave that kind of study for further research and refer the reader to other acoustic studies on Salish languages. These include Watt et al. (2000) on Sḵwx̱ú7mesh (Squamish), and Caldecott (2006) on St'át'imcets (Lillooet).

(6) Acoustic correlates of stress

θáθən (mouth)	á	ə
Intensity	81 (Db)	70 (Db)
Pitch	88 (Hz)	77 (Hz)
Length	132 (ms)	67 (ms)
sq̓ʷáŋiʔ (head)	á	i
Intensity	88 (Db)	81 (Db)
Pitch	106 (Hz)	85 (Hz)
Length	147 (ms)	76 (ms)
t̓ə́m̓sən (he got hit on the head)	ə́	ə
Intensity	89 (Db)	90 (Db)
Pitch	233 (Hz)	115 (Hz)
Length	89 (ms)	71 (ms)

Czaykowska-Higgins and Kinkade (1998) also point out that unstressed vowels in most Salish languages often reduce to schwa or are completely deleted (see Kinkade 1998a). Along with Montler (1986), I found the same to be true of SENĆOȾEN. In most cases full vowels are reduced to schwa when unstressed. In some words an unstressed full vowel deletes. Usually this is only the case if the resulting cluster is allowed in the language. I will discuss this further in section 2. For now, I provide an example to illustrate my point. In (7a) the word has a full vowel /i/. When this root is concatenated with a lexical suffix with a full vowel, it is the vowel in the root which is deleted. The form in (7b) is left with a word initial obstruent cluster, which is allowable in the language.

(7)	a.	ȽIW̱	ɬixʷ	*three*	(FN 2006)
	b.	ȽW̱ÁȽ	ɬxʷeɬ	*three times*	(FN 2006)

Another major property of stress discussed by Czaykowska-Higgins and Kinkade (1998:16) is the morphological hierarchy. They say that, traditionally, morphemes in many of the Salish languages have been divided into three classes: strong, variable and weak. The surface stress of a word depends upon the following morphological hierarchy: strong suffix >> strong root >> variable root >> variable suffix >> weak root >> weak suffix. Most early work on Salish stress appeals to this hierarchy when accounting for stress. Many Salishanists derive the stress rules by assuming that there is an interaction between phonologically motivated stress rules and constraints or features lexically-specified on morphemes (Czaykowska-Higgins and Kinkade 1998:16). In contrast, most of the data presented in this paper can be accounted for simply by phonological constraints on stress. However, there is a subset of examples, such as the word in (7b) in which stress does not fall on the penultimate syllable. In contradiction to my central claim that stress is predictable, (7b) strongly suggests that some suffixes may in fact be lexically specified for stress and that there is some amount of morphologically governed stress present in SENĆOŦEN. As mentioned this is a preliminary investigation into stress assignment in SENĆOŦEN, to that end I attempt only an account of those forms which I can predict and leave those that I cannot for future research.

Three recent works on stress in Salish languages are 1) Dyck (2004) on Sḵwx̱wú7mesh (Squamish), 2) Shaw et al. (1999) on Musqueam and 3) Kiyota (2003) on SENĆOŦEN. All use Optimality Theory to account for stress in these Salish languages, illustrating that the stress systems of the languages build trochaic feet. Shaw et al. (1999) and Dyck (2004) both deal with morphologically governed stress by assuming that some roots and lexical suffixes are lexically specified for stress. These types of morphemes are accounted for by appealing to faithfulness constraints. These constraints ensure that properties present in the input are also present in the output. In addition, Dyck (2004) and Shaw et al. (1999) also point out that many of the perceived lexical properties of Musqueam and Sḵwx̱wú7mesh (Squamish) are actually due to the phonological distinction between a full vowel and schwa. Kiyota (2003), although following Montler's (1986) ideas that SENĆOŦEN stress is a morphologically complex, also demonstrates, through his stress analysis of the SENĆOŦEN plural, that the language is sensitive to the phonological distinction between full vowel and schwa.

All three scholars are able to use OT constraints to account for the weight distinction discussed above. Dyck (2004), Kiyota (2003) and Shaw et al. (1999) use varying versions of the constraint Weight to Stress Principle (WSP). Kiyota (2003) also uses the constraint Max-μ.

WSP states that stress is attracted to heavy syllables. I found no evidence for a distinction between closed bimoraic and open monomoraic syllables in SENĆOŦEN, and therefore cannot conclude that stress in the language is attracted to bimoraic, heavy syllables as opposed to light monomoraic ones. However, it is understood by Salishanists that in Salish languages full vowels have a mora and thus have weight, but that schwa has no mora and is thus weightless, and that stress in SENĆOŦEN clearly prefers full vowels over schwa. To account for this same fact in Squamish Dyck (2004:91) uses a modified version of WSP, Weight to Stress Principle Prime (WSP′). This constraint states that if a syllable has any weight it should be stressed. Dyck (2004:91) uses this modified version because Squamish schwa-resonant sequences sometimes pattern phonologically with full vowels. In some cases a schwa-resonant sequence attracts stress from a full vowel, suggesting that they are of equal weight. In order to prevent full vowels from reducing when unstressed, Kiyota (2003:26) uses the constraint Max-μ. If an unstressed full vowel is reduced it will lose its mora in the output, thus violating this constraint.

In this paper, I adopt both of these constraints. First, I follow Dyck (2004:91) in her decision to use WSP′. I use this constraint for two reasons. 1) it captures the fact that full vowels reduce to schwa when unstressed and 2) because there are words in SENĆOŦEN which strongly suggest that some schwa-resonant sequences and full vowels are equal in weight.[8] Second, I follow Kiyota (2003:25) by using Max-μ. This constraint ensures that a full vowel is not reduced in the output. Therefore, output candidates with a schwa followed by a full vowel are penalized if they assign primary stress to the first schwa and reduce the second full vowel. Kiyota (2003:26) notes that full vowels reduce in SENĆOŦEN and says that Max-μ should be ranked low. He leaves this question for future research. In this thesis, I solve the conflict between the process of vowel reduction and the need for segments to retain their mora by ranking Max-μ below WSP′.

1.4. The data.

The examples in this paper are drawn from a combination of sources. Some are from fieldwork conducted, from 2004–2006, with the help of two Saanich Elders. Other examples are drawn from secondary sources, namely Montler (1986 and 1991). The translations which appear in quotation marks are taken directly from these sources. The examples from my own field notes will be indicated by FN and the year elicited. It is the wish of the Elders with whom I worked that they not be individually acknowledged for their help.

In what follows, I will also provide an interlinear gloss, as in (8), which includes the meaning of the root along with the function of the affixes. As mentioned earlier, there are two orthographies used in this paper. The first line of each example uses the alphabet developed by Dave Elliott Sr, the second line uses the North American Phonetic Alphabet, the third line is the interlinear gloss and the fourth line is the translation. The source of the data is in parentheses to the right hand of the example.

(8) DEMSEN
t̓ə́m̓=sən
hit=(LS)FOOT
‘He got hit on the foot’ (FN 2006)

[8] The form /k̓ʷn-naxʷ/ ⇒ k̓ʷə́nnəxʷ suggests that schwa followed by resonant weighs the same as a full vowel. I leave this for future research.

1.5. Optimality Theory.

In this paper, I use Optimality Theory (Prince and Smolensky 1993), also known as OT, to account for stress in SENĆOŦEN. OT is a theory of constraint interactions between universal violable markedness and faithfulness constraints, which are ranked differently in different languages. The OT model of a language consists of two mechanisms: a set of ranked constraints, and a generator GEN, which generates all logically possible candidates for output. The generator is unconstrained by markedness effects and only the constraint ranking will determine the winning output of a given input. Traditionally, there is a tension between faithfulness constraints, which prohibit changes from input to output, and markedness constraints, which penalize universally marked structures.

The interaction between markedness and faithfulness constraints is demonstrated in OT by means of tableaux. Below, I give a skeleton tableau to explain how this works. The constraints are listed in the top row of the tableau, and the input is in the top left corner. Constraints are listed in order of their ranking, with the highest ranked constraint(s) to the left. A thick solid line between constraints shows that they are ranked with respect to each other, while a thin line shows that they are not.[9] The candidates are listed in the leftmost column. Constraint violations are indicated by an asterisk. If the violation is fatal, causing the candidate to be ruled out, an exclamation mark is added to the asterisk.

In the tableau below, constraints 1 and 2 are not ranked with respect to each other, so while each candidate violates one of them, both are still potentially the optimal candidate. Constraint 3, which is ranked lower than 1 and 2, but higher than 4, is violated fatally by Candidate B, causing Candidate A to be the winner; this is shown by the pointing hand. Constraint 4 is violated by Candidate A, but this does not matter, because it is the only candidate left. All columns after the fatal violation are shaded, to show that the constraints below the fatal violation need not be considered.

Input	Constraint 1	Constraint 2	Constraint 3	Constraint 4
☞Candidate A	*			*
Candidate B		*	*!	

1.6. An outline of the paper.

The analysis in this paper relies heavily on the idea that there is a difference between full vowels and schwa. Therefore it is useful to devote some space to a discussion of the status of schwa in SENĆOŦEN. To that end, in Section 2, I discuss the background literature concerning the predictability of schwa in Salish languages. I also

9 Thick solid lines between two constraints indicate a crucial ranking, while a thin line indicates no crucial order. I depart from the traditional use of perforated lines because of a word processing incompatibility. The pointed hand identifies the winning candidate, while a sad face means that a candidate lost when it should have won. A bomb beside a candidate, indicates that a candidate has been incorrectly predicted as optimal. Shaded cells indicate that the violation of a constraint is irrelevant to the analysis because the candidate has already fatally violated a higher constraint. An asterisk indicates that a candidate has violated a constraint. An asterisk with an exclamation mark indicates that the candidate has fatally violated a constraint.

show that schwa is, in some cases, predictable by showing that there are a number of consonant cluster prohibitions present in the language. I propose that schwa shows up to prevent such clusters from occurring. In section 3, I go on to examine stress in SENĆOŦEN roots, showing that the basic stress pattern in SENĆOŦEN roots is in fact predictable. Following Montler's (1986) initial observation, I am able to show that stress has a tendency to be penultimate and that stress is attracted to weight. More specifically, stress is attracted to full vowels in preference to a schwa.

In section 4, I examine the stress pattern in words which have lexical suffixes. Previously the stress assignment for these kinds of words has been considered to be extremely complex. I will show that, for the most part, these types of words can be accounted for with the same analysis used in section 3. I also discuss some apparently exceptional data. These forms bring up a couple of possible phonological issues which could be examined in future research. These include the presence of layered derivational structure, and excrescent schwas. In this section, I also briefly discuss some exceptions that are not accounted for by my analysis.

Section 5 is a summary of the paper and a discussion of the results and implications for future study. This paper also includes one appendix, a conversion chart, which compares the Dave Elliott Orthography, the Americanist Phonetic Alphabet and the International Phonetic Alphabet.

2. Schwa and consonant clusters.

In this section, I show that SENĆOŦEN schwa is predicted to occur in the environment of illicit consonant clusters. However, I accept that not all instances of schwa are predictable. For instance, schwa often occurs at the end of words, a puzzle that has alluded Salish linguists for a very long time. I make no attempt to account for such forms and leave this area for future research. In 2.1, I provide a discussion of what others have said about schwa in the Salish languages. This section discusses the various sources of schwa as well as commenting on the difference between epenthetic schwa and excrescent schwa. I account for excrescent schwas by suggesting that they ease the articulation between two sounds which would otherwise be difficult to pronounce. However, having not carried out a phonetic study of excrescent schwas, I leave room for the possibility that the presence of these segments, in some of the examples found in this paper, may in fact be a result of a non-SENĆOŦEN speaker's auditory perception when encountering unfamiliar consonant clusters. Whatever the source of these schwas, I maintain that they are not present in the phonological sense and play no role in the assignment of stress. In 2.2, I show the types of consonant clusters that are present in SENĆOŦEN and the combinations of consonants that are prohibited from clustering. I demonstrate that epenthetic schwa occurs predictably in order to prevent illicit consonant clusters from occurring. 2.3 is a summary of the section.

2.1. Schwa.

The phonemic status of schwa has been widely debated in the Salish literature (see Kinkade 1998a on Salish languages in general; Carlson 1989 on Spokane; Czaykowska-Higgins 1993 on Moses-Columbian; Bianco 1996 and Urbanczyk 2000 on Lushootseed; Bianco 1996 on Cowichan; Shaw et al. 1999 on Musqueam; and Blake 2000b on Sliammon). All the research points to the conclusion that schwa is largely predictable in Salish. Kinkade (1998a) proposes that there are four sources for schwa in Salish languages. 1) it is derived; 2) it is a reduced vowel; 3) it is excrescent; or 4) it is epenthetic. Bianco (1996:70) notes that according to Kinkade (1998a), “derived” schwa alternates with the consonant [m]. This is only reported for Nxaʔamcín and Bianco (1996:70) does not find it relevant for Cowichan phonology. I also did not find this type of schwa to be relevant to the phonology of SENĆOŦEN. Bianco (1995:70) also acknowledges that schwas which derive from underlying full vowels are found in all Salish languages. This source of schwa is an unstressed full vowel. In (1), I provide an example from SENĆOŦEN. The underlying full vowel of the root reduces to schwa when unstressed.

(9) /t̓ᶿekʷ=iqʷ-ŋ/ ⇒ t̓ᶿəkʷ=íqʷ-əŋ’
wash=(LS)HEAD-MID-[ACT]
‘He/she/it is washing his/her/its hair.’ (Montler 1986:85)

An excrescent schwa is an optional transitional vowel. It has been argued for most Salish languages that these segments show up between obstruents and resonants to ease articulation (see Bagemihl 1991:600, Bianco 1995:67, Czaykowska-Higgins and Willett 1997, Kinkade 1998a, Matthewson 1994:5). These types of schwas are not considered to be phonological and the assumption is that they are phonetically shorter than epenthetic (phonological) schwas. However, although this assumption is testable, an acoustic analysis of SENĆOŦEN schwa is beyond the scope of this paper. An acoustic analysis has been carried out for St'át'imcets by Shahin and Blake (2004), and I hope to carry out such a study for SENĆOŦEN in the future. Below in (10), I present an example of an optional excrescent schwa found in SENĆOŦEN.

(10) a qʷáy̓ -ə=čəp.[10]
dead-CONN=(LS)FIRE
‘Ashes’ (Montler 1986:73)

b. ꝀOÍĆEP qʷáy̓=čəp
dead=(LS)FIRE
‘Ashes/charcoal’ (FN 2006)

Montler (1986:73) reports the presence of a connector morpheme in the word for *ashes*, which suggests that the form in (10a) exhibits ante-penultimate stress. However, it is hard to say whether this schwa was in fact produced by the speaker or just perceived by the transcriber. In Leonard (2006b:7), I propose that the form in (10a) in fact follows the default penultimate stress pattern of SENĆOŦEN. Instead of analyzing the schwa as a connector, I argue that it is excrescent, surfacing only to ease articulation from the resonant to the affricate. The form in (10b) was offered by Saanich Elders as an alternate pronunciation.

An epenthetic schwa is always inserted into illicit clusters. Such schwas serve as

[10] I have chosen to use the Dave Elliott alphabet only when the spelling has been checked with a Saanich Elder.

the peaks of syllables and are considered to be phonological. These kinds of schwas are counted for stress and are themselves stressed when in the appropriate position in a word. The distinction between excrescent and epenthetic schwa is the distinction between phonetic and phonological. In this paper, I am interested in Kinkade's (1998a) last two sources of schwa. I argue that excrescent schwa optionally surfaces or is perceived between licit consonants clusters with varying places of articulation or between non-tautosyllabic obstruents and resonants. Conversely, epenthetic schwa surfaces predictably as a strategy to prevent illicit consonant clusters from occurring.

In the next section, I demonstrate this predictability of schwa by presenting the types of licit and illicit consonant clusters present in SENĆOŦEN.

2.2. Consonant clusters in roots.

In the quest to discover if schwa is predictable, it is useful to look at root shapes which have consonant clusters and to compare them with roots that surface with a CəC shape. I have restricted my investigation to roots with only three consonants because it is difficult to ascertain if forms with more than three consonants are truly mono-morphemic. Forms with a greater complexity of both shape and meaning are addressed in section 4. Using Montler's (1991) word list, which contains approximately 1927 words, I examined 174 three consonant roots, 157 of which I was fortunate enough to check with two Saanich Elders.[11] I tried to avoid any forms which I suspected had transitive morphology, as well as forms which looked as though they contained a lexical suffix. Below, I present the different shapes that these three-consonant roots can have and how many of each type occur. By doing this, I will be able to illustrate in the following sections, the types of consonant cluster restrictions present in SENĆOŦEN. I show that schwa is predictably surfacing to avoid these restrictions.

(11) Surface root shapes in SENĆOŦEN

Surface Shape	Orthography	Phonetic	Gloss	Number
CVCəC	TÁḴEȽ	téqəɬ	*spear grass*	54
CVCC	ṮÁḴT	ƛ̓éqt	*long/tall*	18
CCVC	TḴÁP	tqép	*saltwater fish trap*	15
CəCVC	MEṮÁL	məƛ̓él	*pass out*	30
CCəC	KTEX	q̓təx̌	*rattle*	11
CəCəC	ḴELEṈ	qə́ləŋ	*eye*	39
CəCC	EU,Q	ʔə́w̓k̓ʷ	*finish off*	7

[11] Due to time constraints and in the interests of not over-taxing the Saanich Elders, I only include in the paper those forms which were checked and verified with the speakers.

2.2.1. Clusters root initially.

In this section, my aim is to discover the types of restrictions on root initial clusters present in SENĆOŦEN. I show that schwas are predictably inserted between segments which are prohibited from occurring together in a cluster. I begin by laying out the permissible consonant clusters that are attested in the data. In (4), I provide a few examples of the clusters which surface root-initially in SENĆOŦEN. Strikingly, they all consist of two obstruents.

(12) Root initial obstruent clusters

OO Clusters	Orthography	Phonetic	English
STOP STOP	TK̲ÁP ꝀBOX̲ ꝀTEX	tqep q̓p̓ax̌ q̓təx̌	*saltwater fish trap* *hazel nut* *rattle*
STOP AFFRICATE	None Attested		
AFFRICATE STOP	ĆQEN ĆKEN,	čk̓ʷən čq̓ən̓	*catch a glimpse of* *file*
STOP FRICATIVE	TSOS PW̲ÁN̲ QSEĆ	tsas pxʷeŋ k̓ʷsəč	*poor* *wind blown fire* *trout*
FRICATIVE STOP	ȽKIT	ɬq̓it	*any clothes*
AFFRICATE AFFRICATE	T̲ĆÁS	ƛ̓čes	*Discovery Island*
AFFRICATE FRICATIVE	ȾXIT JSȺ	t̓ᶿx̌it č̓sey	*pebbles* *Douglas fir*
FRICATIVE AFFRICATE	None Attested		
FRICATIVE FRICATIVE	XȽÁM, W̲ŦIȽES	x̌ɬem̓ xʷθiɬəs	*watch* *sidehill*

The only obstruent-obstruent combination not present in the data involves a stop followed by an affricate. It is difficult to determine whether this is an accidental gap or a prohibition against this type of cluster in SENĆOŦEN. There is only one example each of clusters involving two affricates and none involving fricatives followed by affricates. However, I believe that these kinds of clusters are allowed in SENĆOŦEN, as they are present in polymorphemic words.

The types of obstruent clusters presented in (4) likely do not form complex onsets.

There are two reasons to suppose this proposition: 1) in some cases the two obstruents do not share the same laryngeal features. It is commonly argued that, cross-linguistically, onset clusters agree in their laryngeal features. If they do not, as is the case with q̓təx̌ in (4), then the usual case is for the more marked segment, in this case an ejective, to follow the less marked segment, in this case a plain obstruent (see Urbanczyk 2000:115–18, Greenberg 1978, Lombardi 1991, and Lamontagne 1993 (cited in Czaykowska-Higgins and Willett 1997)). Examples such as q̓təx̌ do not follow this pattern. 2) the order of the segments often violates the SONORITY SEQUENCING PROFILE (see Selkirk 1984, Steriade 1982, Clements 1990, Kenstowicz 1994, and Zec 1995), which states that the sonority of the onset should rise toward the peak. In (4), there are a number of examples where fricatives and affricates occur before a stop in a cluster. Fricatives and affricates are considered to be more sonorous than stops. These types of observations have been used as arguments against complex onsets in other Salish languages (for example Czaykowska-Higgins and Willett 1997:393, Urbanczyk 2000:73).

There are four forms in Montler (1991) which are exceptional in that they have a schwa inserted between two obstruents that are expected to cluster (see (5)). The first example suggests a prohibition against a cluster involving a dental fricative and a uvular stop. The second and third examples suggest a prohibition against a cluster involving two segments which share the same place and laryngeal features. The fourth example involves a velar stop and a post-alveolar affricate.

(13)	a.	*θq	ȾEK̲I	θə́qi	*sockeye*
	b.	*q̓q̓	KEKI,	q̓əq̓î́ʔ	*guts*
	c.	*qq	K̲EK̲ET̲	qə́qəƛ̓	*shadow*
	d.	*kʷč	ȻEĆIL,	kʷəčíl̓	*morning*

Each set of exceptions, described above, can be explained straightforwardly, with the exception of (a). There seems to be no reason for the schwa to be inserted between the first two consonants. The examples in (b) and (c) are accounted for by assuming that there is a prohibition against segments which share the same place and laryngeal features. In other words there is a prohibition against two identical segments root initially. An epenthetic schwa is inserted to prevent such a cluster. This schwa is counted for stress in example (b), but is not stressed because there is a full vowel present in the root. In (c) however, the epenthetic schwa is stressed because it is one of two schwas in the root and is in the penultimate position. The idea that there is a prohibition against obstruent clusters sharing the same laryngeal features is consistent with the obstruent morpheme structure constraint proposed for Nxaʔamcîn by Bessell and Czaykowska-Higgins (1993:42), which states that if there is a root morpheme structure of the shape C(V)CX the first two consonants cannot share the same laryngeal features. Although this constraint cannot be directly applied to the examples in (5b,c), it strongly suggests a prohibition against obstruents sharing laryngeal features. SENĆOȾEN only has a prohibition against obstruents sharing the same laryngeal feature, if those obstruents also share the same place feature. In Lushootseed the Obligatory Contour Principle, which states that adjacent segments cannot both have the same features, blocks syncope in reduplication processes (Urbanczyk 1995:520).

I suggest that the schwa in example (d) is an underlying full vowel. The word meaning *day* is skʷéčəl (Montler 1991:152). kʷəčíl̓ is likely the actual form of *day,* note the glottalization of the /l/ which is commonly associated with this morpheme.[12]

In contrast to obstruents, resonants are not involved in consonant clustering root initially, even if their presence would conform to the SONORITY SEQUENCING PROFILE.[13] Instead, an epenthetic schwa surfaces to avoid such clusters. There are two reasons for assuming that these schwas are epenthetic rather than excrescent. First, these schwas are counted for stress and second, there are no examples in the data of root initial clusters involving resonants and obstruents. The appearance of schwa in such sequences is not optional.

(14) Root initial resonant obstruent cluster prohibitions

R O Cluster Prohibitions	**Orthography**	**Phonetic**	**English**
RESONANT STOP	NEȻIM NEḰȺ	*nkʷ nəkʷím[14] *nqʷ nəqʷéy	*black* *yellowish green*
STOP RESONANT	ḴELEX QELU	*ql qə́ləx̌ *k̓ʷl k̓ʷə́ləw̓	*salmon eggs* *skin*
RESONANT AFFRICATE	MEṮÁL NEŦÁW̱	*mƛ̓ məƛ̓él *nt̓ᶿ nət̓ᶿéxʷ	*pass out* *once*
AFFRICATE RESONANT	ĆELEM ṮEUWEṈ	*čl čə́ləm *ƛ̓w ƛ̓ə́wəŋ	*eel grass* *howl*
RESONANT FRICATIVE	ṈESEN, WEXES	*ŋs ŋə́sən̓ *wx̌ wə́x̌əs	*louse* *march*
FRICATIVE RESONANT	ŚELEĆ X̱ÍL	*šl šə́ləč *x̌ʷl x̌ʷəyl̓	*world* *lose, die*
RESONANT RESONANT	LELEJ	*ll lə́ləč̓	*yellow*

In summary, I have shown that roots with three consonants allow obstruent clustering root initially. To prevent prohibitions, such as segments with the same manner and place, and clusters which involve resonants, an epenthetic schwa surfaces. I have also suggested that when the articulators of two segments differ in place of articulation, such that one articulator is at the front of the mouth and the other at the back, an excrescent

12 I would like to thank Timothy Montler for pointing this out.
13 This was first pointed out by Montler (1989:101).
14 *nə-* may be a colour prefix.

schwa surfaces during the transition. The root initial cluster prohibitions discussed above strongly suggest by extension that schwa is predictable in SENĆOŦEN. Similar findings have been obtained for other Salish languages (see Bagemihl 1991, Bates and Carlson 1992, Blake 2000b, Bianco 1996, Czaykowska-Higgins and Willett 1997, Matthewson 1994, Shaw 2002 and Urbanczyk 2000). To further my claim that SENĆOŦEN schwa is predictable in the environment of consonant clusters, I now turn to an investigation of consonant clustering root finally.

2.2.2. Clusters root finally.

The clustering facts in root final position are more complex than they are for root initial position. Along with clustering of obstruents, combinations of stops and resonants are free to cluster in this position. However, with the exception of three examples, clusters root finally must follow the SONORITY SEQUENCING PROFILE. Examples of the types of clusters observed in Montler (1991) are presented in (15).

(15) Obstruent clusters in root final position

OO clusters	Orthography	Phonetic	English
STOP STOP	T̲AK̲T ŦIȻT	ƛ̓eqt θikʷt	*long/tall* *sea cucumber*
AFFRICATE STOP	None Attested		
STOP AFFRICATE	None Attested		
AFFRICATE AFFRICATE	None Attested		
FRICATIVE STOP	IST W̲IW̲Q	ʔist xʷixʷk̓ʷ	*paddle* *red flowering current*
STOP FRICATIVE	ŦOTX		*halibut*
FRICATIVE AFFRICATE	None Attested		
AFFRICATE FRICATIVE	ĆIĆX	čičx̌	*cherry bark pitch*
FRICATIVE FRICATIVE	ÁSW̲	ʔesxʷ	*seal*

I consider clusters ending in fricatives to be illegitimate in SENĆOŦEN. In the three examples ending in a fricative, the clusters all involve a final fricative that is either [xʷ] or [x̌]. I suggest that in these cases the last consonant constitutes the head of a syllable. I will discuss this idea further in section 4. The usual case in SENĆOŦEN, is for root-final clusters involving a final fricative to be separated by an epenthetic schwa, as shown in (16).

(16) WEXES wə́x̌əs *March/frog, croaking*
PO,ȾES páʔt̓ᶿəs *cradle board*
ȾIDES t̓ᶿit̓əs *front*
W̲O,DEȽ xʷáʔt̓əɬ *Spieden Island*

In contrast to root-initial position, clusters involving resonants can occur in root-final position. However, if there are two resonants in a root-final position they can only cluster if they follow the SONORITY SEQUENCING PROFILE .

(17) Resonant clusters in root final position

Resonant Clusters	Orthography	Phonetic	English
RESONANT STOP	E,UQ MELḰ HÁUT	ʔəw̓k̓ʷ məlqʷ hewt	*give out/ be all gone* *uvular* *rat*
STOP RESONANT	None Attested		
RESONANT AFFRICATE	None Attested		
AFFRICATE RESONANT	None Attested		
RESONANT FRICATIVE	ĆIWX	čiwx̌	*fall apart*
FRICATIVE RESONANT	None Attested		
RESONANT RESONANT	X̱ÍL	x̌ʷəyl̓	*lose/die*

I found no instances of resonant and affricate clusters. This maybe an accidental gap, or it may be that such clusters are prohibited because they do not decrease in sonority sufficiently.

There is one example attested in the data involving a cluster of a resonant followed by a fricative /čiwx̌/. This may be an exception, however, a possible analysis is to assume that the uvular fricative, in this case, forms its own syllable with the preceding consonant. I will pursue this line of thinking further in section 4. The other three forms, which have a resonant followed by a fricative root finally have an epenthetic schwa inserted between the two consonants. Notice that the fricatives are neither [xʷ] or [x̌].

(18)
a. ŚPOLES špáləs *pare/peel* (FN 2006)
b. ḰENES qʷə́nəs *whale* (FN 2006)
c. TOM,EL tám̓əɬ *warm water* (FN 2006)

The clearly viable clusters involving resonants are clusters involving a resonant followed by a stop, and a plain glide followed by a glottalised resonant. In other languages, such as Kwakw'ala (northern Wakashan), glottalised segments are considered to be less sonorous than plain resonants (Zec 1995). Therefore, a form like xʷəyl̓ does not violate the SONORITY SEQUENCING PROFILE.

There are three exceptions to the generalisation about root-final clusters. The last two segments in the forms in (19) do not violate the SONORITY SEQUENCING PROFILE. However, rather than form a cluster they are separated by an intervening schwa.

(19)	a.	* lq	W̱ÁLEḴ	xʷéləq	*almost*	(FN 2006)
	b.	* yq̓	ŁÍEK	ɬə́yəq̓	*shiner*	(FN 2006)
	c.	* nt	SṈÁNET	sŋénət	*mountain*	(FN 2006)

As discussed earlier, I argue that there is no restriction on resonant and stop clusters occurring root finally. To account for examples like those in (11a,b) therefore, it is necessary to assume that the schwa surfacing between the two consonants is a transitional or excrescent schwa which is only audible because the tongue is moving from a coronal place of articulation to a dorsal place. Example (11c) may be epenthetic suggesting a prohibition against adjacent resonant and obstruent coronal segments.

Following the SONORITY SEQUENCING PROFILE, clusters that rise in sonority away from the nucleus are expected to be prohibited. For the most part this is the case in SENĆOŦEN. The data in (20) show that in root final position, SENĆOŦEN is sensitive to the sonority difference between obstruents, where affricates are more sonorous than stops.

(20) Rising sonority cluster prohibitions in root final position

Rising Sonority	Orthography	Phonetic	English
STOP AFFRICATE	ḴEḴEṮ SETEJ	* qƛ̓ qəqəƛ̓ * tč̓ sətəč̓	*shadow* *world*
STOP FRICATIVE	ȾIDES TAḴEŁ	* t̓s t̓ᶿit̓əs * qɬ teqəɬ	*waterfront* *spear grass*
STOP RESONANT	DÁȻEL ḴAḴEN	* kʷl t̓ekʷəl * qn qeqən	*cross over the water* *house post*
AFFRICATE FRICATIVE	ṈEȾEŁ	* tᶿɬ ŋətᶿəɬ	*pus*
AFFRICATE RESONANT	TÁĆEL	* čl tečəl	*arrive*
FRICATIVE RESONANT	ṈESEN, ŦIŁEṈ	* sn̓ ŋəsən̓ * ɬŋ θiɬəŋ	*louse* *stand*

2.2.3. Clusters with glottal stop.

I found no instances where a glottal stop was involved in clustering in either root-initial or root-final position. Glottal stop is usually considered an obstruent. Given this, we would expect roots such as ʔəšés *sealion* to allow clustering in root initial position. However, this is not the case. The example x̌ačəʔ *lake* also suggests that glottal stop is not patterning with the obstruents. If it were, then we would expect the root final cluster *čʔ. In terms of phonotactics then, SENĆOŦEN glottal stop behaves more like a sonorant segment.[15]

2.4. Section summary.

In summary, I have presented the allowable consonant clusters found in SENĆOŦEN.

(21) Cluster types in SENĆOŦEN

Initial		Final	
Attested	**Illicit**	**Attested**	**Illicit**
STOP STOP	STOP AFFRICATE	STOP STOP	STOP AFFRICATE
STOP FRICATIVE	STOP RESONANT		STOP FRICATIVE
AFFRICATE FRICATIVE	AFFRICATE RESONANT		STOP RESONANT
AFFRICATE AFFRICATE	FRICATIVE RESONANT		AFFRICATE STOP
AFFRICATE FRICATIVE	RESONANT STOP		AFFRICATE AFFRICATE
FRICATIVE STOP	RESONANT AFFRICATE		AFFRICATE FRICATIVE
FRICATIVE AFFRICATE	RESONANT FRICATIVE		AFFRICATE RESONANT
FRICATIVE FRICATIVE	RESONANT RESONANT	FRICATIVE STOP	FRICATIVE AFFRICATE
	OBSTURENT GLOTTAL		FRICATIVE FRICATIVE
	GLOTTAL OBSTRUENT		FRICATIVE RESONANT
	RESONANT GLOTTAL	RESONANT STOP	RESONANT AFFRICATE
	GLOTTAL RESONANT	RESONANT RESONANT[16]	RESONANT FRICATIVE
			RESONANT RESONANT[17]
			OBSTRUENT GLOTTAL
			GLOTTAL OBSTRUENT
			RESONANT GLOTTAL
			GLOTTAL RESONANT

For the most part, I expect a schwa to be inserted any time two consonants would otherwise form an illicit cluster. The next section is a discussion of stress assignment in SENĆOŦEN roots.

15 Glottal stop in Cowichan is also treated as a sonorant segment (see Bianco 1996).
16 Only if there is a decrease in sonority. This means a plain resonant followed by a glottalized resonant.
17 This includes two plain resonants or two glottalized resonants.

3. Stress in SENĆOŦEN roots.

3.1. Introduction.

In this section, I provide a formal analysis of stress in SENĆOŦEN disyllabic roots. Drawing on the work of Dyck (2004) and Kiyota (2003), I am able to verify Montler's (1986:23) observation that stress assignment in SENĆOŦEN has a tendency to be penultimate. Following Montler (1986:23), who says that stress will fall on the first full vowel in the word, I further support the claim that the language is sensitive to the weight distinction between a full vowel and a schwa. 3.2, begins with an illustration of the possible stress patterns found in SENĆOŦEN. In 3.3, I provide a formal account of stress in SENĆOŦEN disyllabic roots, with 3.3.1 being an account of stress in disyllabic roots with two full vowels, 3.3.2 an account of stress in disyllabic roots which have a full vowel and a schwa, and 3.3.3 presenting an account of disyllabic words with two schwas. Finally, a short summary of this section is given in 3.4.

3.2. Observed stress pattern for disyllabic roots.

The data in (22) illustrate the possible surface stress patterns found in SENĆOŦEN disyllabic roots.

(22)	a.	[v́ v]	SȻOTI	$sk^wáti$	*crazy, insane*
	b.	[v v́]	TI,TOS	tiʔtás	*bucking tide*
	c.	[v́ ə]	SPÁ,EŦ	spéʔəθ	*bear*
	d.	[ə v́]	SḴELÁU	sqəléw’	*beaver*
	e.	[ə́ v]	ŦEKI	θə́qi	*sockeye*
	f.	[ə́ ə]	ḴELEX	qə́ləx̌	*salmon eggs*

At first glance, stress appears to be unpredictable in SENĆOŦEN. In words with two full vowels, stress can fall on the penultimate or the final syllable. For words with a full vowel and schwa, stress can fall either on the full vowel or the schwa. Examples like those in (22) might suggest that the stress pattern of SENĆOŦEN is random. However, in 3.3, I will show that the default stress pattern in SENĆOŦEN is in fact predictable. I will demonstrate that the language prefers to build left-headed binary feet and that stress is sensitive to the weight distinction between a full vowel and a schwa. The gaps [ə ə́][18] and [v ə́] are shown to be predictable when the following analysis is taken into consideration.

3.3. Stress in disyllabic roots.

In this section, I will present a formal analysis of stress in SENĆOŦEN disyllabic roots, focussing, in 3.3.1, on disyllabic roots with two full vowels, in 3.3.2, on disyllabic roots with a full vowel and a schwa, and in 3.3.3, on disyllabic roots which surface with two schwas.

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[18] [ə ə́] may not be entirely predictable however, at this point I am only aware of polymorphemic words and loan words with this stress pattern.

3.3.1. Disyllabic roots with two full vowels.

Recall that the list of examples in (22) suggested that SENĆOŦEN stress is unpredictable. In this section, I examine disyllabic roots with two full vowels, showing that, despite initial appearances, the stress in these forms is in fact predictable. The default stress pattern of these kinds of roots suggests that syllables are parsed into left headed feet. A sample of disyllabic roots containing two full vowels is given in (23). These roots are further categorized: in (a) stress falls on the penultimate and in (b) stress falls on the final syllable.

(23) a. Stress on the penultimate syllable

SȻOTI	skʷáti	*crazy*
SḴOṈI,	sq'ʷáŋiʔ	*head*
JÁ,WI,	č̓éw̓iʔ	*dish*
KÁ,Ṉ I,	q̓éŋiʔ	*girl*

b. Stress on the final syllable

TI,TOS	tiʔtás	*bucking tide*
SX̱I,ÁM,	sx̌ʷiʔém̓[19]	*mythical story*

The data in (23a) illustrate that syllables are parsed into binary feet. These feet are stressed on the leftmost syllable and are thus trochaic at the syllabic level. This observation can be formalised by appealing to the following OT constraints (Prince and Smolensky 1993, McCarthy and Prince 1993):

(24) FT-BIN σ Feet are binary at the syllabic level
(25) HEAD L Feet are left headed at the syllabic level
(26) PARSE σ Syllables are parsed by metrical feet

The first constraint, FT-BIN σ, requires that feet are binary at the syllabic level. This means that each metrical foot should contain two syllables. This constraint ensures that a root such as sq̓ʷáŋiʔ 'head' is parsed as (sq̓ʷá . ŋiʔ) not as *(sq̓ʷá) (ŋî ʔ).[20] In natural languages there are two types of possible foot forms. The first is called trochaic, where feet are stressed on the leftmost syllable, and the second is termed iambic, where stress is on the rightmost syllable. Feet in SENĆOŦEN are trochaic as opposed to iambic. This foot type is captured by the OT constraint HEAD L. Both trochaic feet and iambic feet are illustrated in (6).[21]

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[19] Interestingly, when there are two full vowels in a SENĆOŦEN disyllabic root one is always an /i/. I suggest that unstressed [i] is always the result of an unstressed [ə] next to a glide and is always weightless.

[20] The brackets indicate foot boundaries.

[21] foot = φ, syllable =σ, strong= s, weak=w

(27) Trochee / Iamb

Trochee	Iamb
φ	φ
σ σ	σ σ
s w	w s
sq̓ʷáŋiʔ	tiʔtás

The constraints discussed so far do not need to be crucially ranked. This is because the optimal candidate is the only form that does not violate any of the constraints. This is illustrated in (28).

(28) skʷáti 'crazy'

skʷati	HEAD L	FT -BIN σ	PARSE σ
☞ a. s(kʷáti)			
b. s(kʷatî)	*!		
c. skʷa(tî)		*!	*

In (28), candidate (a) wins because it does not violate any of the constraints. Candidate (b) loses because it violates HEAD L. Candidate (c) does not violate HEAD L; instead it loses because it violates FT-BIN σ.

The data in (2b), repeated here in (29), exhibit surface stress on the second syllable.

(29) TI,TOS tiʔtás *bucking tide* SX̱I,ÁM, sx̌ʷiʔém̓ *mythical story*

These forms have apparent iambic stress and thus present themselves as exceptions. However, notice that the first vowel in both is an [i] followed by [ʔ]. I assume that the first full vowel is in fact a schwa which has taken on the features of the following glottalised glide. I transcribed the sound as [i] because that is the sound that I perceived when listening to the speakers. It would be useful in the future to carry out an acoustic study of this [i] sound and the [i] which patterns as a full vowel in the phonology. This is a study I intend to pursue in the future. Montler (1986:30) says that glides become full vowels between two consonants and at the end of a word. He also says that glides surface as a full vowel plus glottal stop when following a consonant. Montler (1986:30) offers two examples which argue for the vocalization of palatal glides in SENĆOŦEN. These have been checked by Saanich Elders and are presented below in (30).

(30) a. ÍY,[22]
ʔəy̓
'good' (FN 2006)

[22] *ʔíʔ never surfaces as the form for 'good'. It may be the case that only unstressed schwas can take on the features of glides. I leave this for future research.

b. I,ÁNȻES
ʔiʔ=énkʷəs
good=(LS)STOMACH
'brave' (FN 2006)

c. ĆȺ
čey
'he works' (FN 2006)

d. ĆȺĆI
čey-či
RED-work
'diligent' (FN 2006)

The form in (30b) is built from the root meaning *good* and a lexical suffix meaning *brave*. Montler (1986:30) proposes that the root loses its schwa and the glide vocalizes when concatenated to a suffix. Alternatively, on the assumption that schwa is inserted to prevent an illicit consonant cluster we could say that the underlying structure of this word is as follows:

(31) a. /√ʔy̓=enkʷs/
good=(LS)STOMACH

To get to the surface representation, a schwa is inserted to prevent illicit clusters, both in the root and the suffix. The inserted schwa in the root takes on the features of the following glide and the glottalization is realised as a consonant, yielding the following surface representation. A third possibility is to say that unstressed sequences of /əy/ vocalize to [i].

b. [ʔiʔ=énkʷəs]

In example (9d) the root *he works* has undergone the process of reduplication giving us the form čeyčey. The unstressed full vowel in the second syllable is reduced to schwa which in turn either takes on the features of the following glide, leaving us with the form [čéyči]. Again, we can assume simple glide vocalization, but that leaves us with the question of what happened to the schwa.

The data in (23b) is repeated here in (32) along with the underlying representations. I suggest that an epenthetic schwa is inserted to prevent an illicit cluster. This schwa then takes on the features of the glide and the glottalization is realised as a consonant.

(32) a. tiʔtás *bucking tide* /t̓y̓tas/
b. sx̌ʷiʔém̓ *mythical story* /sx̌ʷy̓em̓/

As stated earlier, only the full vowels in the language have weight and are considered to have a mora underlyingly. Schwas, even if they take on the features of a glide, are not considered to have weight. Thus, in (32) stress is attracted to the only segment in the root that has weight. To formalize this observation, I appeal to three constraints, two used by Kiyota (2003:20–28), and one by Dyck (2004:91). To ensure that full vowels do not reduce in the output, Kiyota (2003:25) uses the constraint Max-μ. This faithfulness constraint requires that moras present in the input should be present in the output.

(33) Max-μ Every mora in the input is present in the output (Kiyota 2003:25)

To capture the idea that schwas which take on the features of adjacent glides are weightless, I adopt Dep-μ. This faithfulness constraint prohibits the presence of a mora in the output if there is none present in the input.

(34) Dep-μ Every mora in the output should be present in the input (Kiyota 2003:26)

Lastly, I use the constraint WSP′. Dyck (2004:91) uses this constraint to ensure that a vowel that has weight is stressed. I use this constraint to ensure that all full vowels which are not stressed on the surface reduce to schwa.

(35) WSP′ If weight then stressed (Dyck 2004:91)

These three constraints are ranked above FT BIN σ. It is more crucial that a vowel with weight be stressed than it is to have a well formed foot.

(36) tiʔ.tás ‘bucking tide’

μ ty̓tas[23]	WSP′	MAX-μ	DEP-μ	HEAD L	FT-BIN σ	PARSE σ
μ ☞ a. tiʔ. (tás)					*	*
b. (tíʔ. təs)		*!				
μ c. (tiʔ. tás)				*!		
μ μ d. (tíʔ. tas)	*!		*			

I assume that there is a high ranking constraint ensuring that a schwa is inserted in the root to break up an illicit cluster. Candidate (a) wins because it does not violate any of the higher ranking constraints. Candidate (b) loses because it violates MAX-μ, candidate (c) loses because it has an iambic foot thus violating HEAD L, and candidate (d) is ruled out because it does not stress the syllable with weight.

3.3.2. Disyllabic roots with full vowel and schwa.

In this section, I examine disyllabic roots containing a full vowel and a schwa. In order to do this I need to establish the correct representation for schwa. Earlier, I showed that schwa is predictable in the instances where it serves to break up an illicit consonant cluster. It is overlooked in most cases of stress assignment in the sense that, if there is a schwa and full vowel in a root, stress will fall on the full vowel even if this results in a violation of the regular stress pattern. Along with Dyck (2004), Kager (1990), Kiyota (2003) and Shaw et al. (1999), I suggest that these kinds of facts can be explained by assuming that full vowels have moraic structure, while schwas do not. I alluded to this type of representation in my discussion of epenthetic schwas, which took on the features of glides while remaining weightless.

[23] I assume that the candidate ty̓tás is ruled out by a high ranking constraint that disallows three consonants word initially.

(37) Representation of full vowel and schwa (Shaw et al. 1999:5)

	a. full vowel	b. schwa	c. reduced schwa
Nucleus	Nuc	Nuc	Nuc
	│		╪
Moraic weight	μ		μ
	│		│
Root node	o		o
	│		│
Features	[f]		[f]

Because schwa is weightless and a full vowel has weight, the current constraint ranking predicts that stress will fall on a full vowel in preference to a schwa.[24] This is true for all the examples except those in (38aii), below, which will be dealt with in (40).

The examples in (38a) exhibit penultimate stress. Those in (38ai) have stress on a full vowel and those in (38aii) have stress on a schwa. The data in (38b) have stress on a full vowel, but differ from the examples in (38a) because they exhibit an iambic stress pattern. The examples in (38b) illustrate, again, that stress is attracted to syllables with weight.

(38) a. Stress on the penultimate syllable

i.	SK̲ÁLEX	sqéləx̌	*clam fork*	(FN 2006)
	SPÁ,W̲EN̲,	spéʔxʷəŋ’	*misty*	(FN 2006)
	SN̲ÁNET	sŋénət	*mountain*	(FN 2006)
	DÁJEK̲	t̓éč̓əq	*angry*	(FN 2006)
	SPÁ,EŦ	spéʔəθ	*bear*	(FN 2006)
ii.	ŦEK̲I	θə́qi	*sockeye*	(FN 2006)
		pə́wiʔ	*flounder*	(Montler 1991:261)

b. Stress on the final syllable

SK̲ELÁU	sqəléw̓	*beaver*	(FN 2006)
SENI,	sənı́ʔ	*Oregon grape berry*	(FN 2006)
ENOW̲	ʔənáx̌ʷ	*bring over*	(FN 2006)
ĆELÁL	čəlél	*almost*	(FN 2006)
ĆELIM	čəlı́m	*even so*	(FN 2006)

In mixed disyllabic roots with a syllable containing a full vowel followed by one with a schwa, stress is always attracted to the syllable with a full vowel. There are two reasons for this: 1) the penultimate syllable has weight and 2) the syllable is in the correct position for trochaic footing. The stress pattern of the examples in (38a) is formalized in (39) using previously introduced constraints. In (39), the winning candidate is (a); it is the only candidate that does not violate any of the constraints. The constraint MAX-μ ensures that candidate (b) is disqualified. The need for feet to be binary eliminates candidate (c)

[24] Following Shaw et al. (1999), I assume that schwas have no place features. It is because the schwa has no place features of its own that it is able to take on the place features of glides.

from the competition. Candidate (d) loses because a syllable with weight is unstressed.

(39) sqéɬəx̌ 'clam fork'

μ sqeɬəx̌[25]	WSP′	MAX- μ	DEP-μ	HEAD L	FT-BIN σ	PARSE σ
μ ☞ a. s(qé. ɬəx̌)						
b. s(qə. ɬə́x̌)		*!		*		
μ c. s(qé). ɬəx̌					*!	*
μ d. s(qe. ɬə́x̌)	*!			*		

At first glance the data in (38aii) look as though they are exceptions to the current analysis. They conform to HEAD L, but appear to stress a weightless syllable over a weighted one. However, as argued above, the final syllable in these examples actually consists of a schwa followed by a glide. The schwa has taken on the features of the glide, but does not have a mora. The two surface syllables are both equally weightless. Syllables of equal weight always have stress on the leftmost syllable of a binary foot. In (40), we can see that candidate (b) is disqualified for violating DEP-μ, and candidate (c) is out because it exhibits iambic footing thus violating HEAD L. The optimal candidate is (a).

(40) θə́qi 'sockeye'

θəqy	WSP′	MAX-μ	DEP-μ	HEAD L	FT-BIN σ	PARSE σ
☞ a. (θə́. qi)[26]						
μ b. θə. (qî)			*!			
c. (θə. qî)				*!		

[25] I have included schwa in the input and assume that there is a high ranking constraint which disallows these kinds of clusters. [ə] is not underlying in this example. The kinds of constraints needed to account for the different types of consonant cluster prohibitions discussed in section 2 still need to be worked out.

[26] I assume that the candidate (θqy) loses because of a high ranking constraint against illicit consonant clusters.

The data in (38b) show that if there is only one syllable with an underlying full vowel in the root, it is that syllable which attracts stress. Stressing a syllable with weight is more important than having trochaic feet. Candidate (a) is the optimal candidate even though this candidate does not have a left-headed binary foot. Candidate (b) is ruled out because it violates MAX-μ and candidate (c) is excluded because it violates HEAD L. Candidate (d) loses because an unstressed full vowel failed to reduce to schwa.

(41) sqə.léw̓ 'beaver'

μ sqəlew̓[27]	WSP′	MAX-μ	DEP-μ	HEAD L	FT-BIN σ	PARSE σ
μ ☞ a. sqə. (léw̓)					*	*
b. (sqə́. ləw̓)		*!				
μ c. (sqə. léw)				*!		
μ d. (sqə́. lew̓)	*!					

3.3.3. Disyllabic roots with two schwas.

Disyllabic roots with two schwas always stress the penultimate syllable. This is expected because these kinds of roots have syllables which are equally weightless. Feet with syllables that are equal in regards to weight are always left-headed.

(42) Stress on the penultimate syllable

TEṈEW̱	tə́ŋəx^{w}	*earth*	(FN 2006)
Ḵ̱ELEX	qə́ləx̌	*salmon eggs*	(FN 2006)
QELU,	k̓^{w}ə́ləw̓	*skin*	(FN 2006)
LEȻEX	lə́k^{w}əx̌	*rib*	(FN 2006)
LELEJ	lə́ləč̓	*yellow*	(FN 2006)

The data in (21) are formalized in (22). Candidate (a) is optimal because it does not violate any of the constraints and conforms to HEAD L.

[27] Again, schwa is included in the input for space considerations and also because the cluster constraints need to be worked out. Schwa is not necessarily considered underlying in these examples.

(43) lə́ləč̓ 'yellow'

lələč̓	WSP′	MAX-μ	DEP-μ	HEAD L	FT-BIN σ	PARSE σ
☞ a. (lə́. ləč̓)						
b. (lə. lə́č̓)				*!		

3.4. Section summary.

In this section, I have provided a first attempt at a formal analysis of stress in SENĆOŦEN disyllabic roots. First, I presented data showing that at first glance, SENĆOŦEN stress appears to be unpredictable. Drawing on the work of Dyck (2004) and Kiyota (2003), I showed that disyllabic roots in SENĆOŦEN are parsed into left-headed binary feet, unless there is a discrepancy in regards to syllable weight. If a syllable has weight, it will bear stress over a syllable that does not, regardless of foot form requirements. The ranking needed to predict stress in SENĆOŦEN disyllabic roots is as follows:

WSP′, MAX- μ, DEP-μ, HEAD L >> FT-BIN σ, PARSE σ.

In the next section, I will formalize the stress of SENĆOŦEN polymorphemic words using the analysis from this section as a starting point.

4. Stress and lexical suffixes.

4.1. Introduction.

In this section, I examine lexical stems that include a lexical suffix. I claim that most of the stress properties previously analysed as morpho-lexical in SENĆOŦEN are actually stressed phonologically and are completely predictable. There is a small number of cases where stress cannot be predicted. I provide a brief discussion about these forms at the end of the section.

Using the analysis of stressed roots presented in section 3, I am able to account for the stress pattern of the majority of root plus lexical suffix combinations found in Montler (1986:65–91). Words which include lexical suffixes exhibit the same basic penultimate stress pattern found for roots. They can be accounted for by assuming that binary feet are left headed, and that stress is sensitive to the weight distinction between full vowels and schwa. In addition, a complete account of these types of words requires that binary feet be aligned to the right edge of the word.

The organization of this section is as follows: in the remainder of this subsection, I provide a definition of the term lexical suffix and provide an overview of how this type of morpheme has been treated in the Salish literature. In 4.2, I discuss the stress properties of words containing roots and lexical suffixes, first looking at lexical suffixes with a full vowel, and then focusing on those which have no underlying vowel. In 4.3, I discuss examples that appear to be exceptions to the proposed stress pattern. In section 4.4, I give a brief discussion of truly exceptional forms and in 4.4, I provide a summary of the section.

4.1.1. Definition and overview of lexical suffixes.

According to Montler (1986:64), “Lexical Suffixes are derivational morphemes with substantive root-like meanings”. These morphemes always occur bound to a root. SENĆOŦEN also has free forms with meanings similar to those of some of these lexical suffixes, but these words often do not resemble the lexical suffixes in form. Some examples are given in (44) and (45), where a free form example is presented alongside an example of a word that contains a lexical suffix with the same meaning. The ‘=’ indicates the concatenation of the lexical suffix.

(44)	a.	MÁ,ȻEȽ	LÁ,E	TŦE	SⱩON̲I,
		méʔkʷəɬ	léʔə	t̓ᶿə	sq̓ʷaŋiʔ
		hurt	PART	DET	head
		‘hurt on the head’			(FN 2004)

b. DEM,IḰ
t̓əm̓=íqʷ
hit=(LS)HEAD
‘He got hit on the head.’ (FN 2004)

(45) a. SÁLES
seles
‘hand’ (FN 2004)

b. ȽQÁSES
ɬk̓ʷ-é=səs
snag-CONN=(LS)HAND
‘He got hooked on the hand’ (Montler 1986:86)

4.1.2. Study of lexical suffixes in SENĆOŦEN.

The first work on SENĆOŦEN is Pidgeon (1970:19–49), a Master’s thesis entitled *Lexical Suffixes in Saanich: Dialect of Straits Coast Salish*, which provides a grammatical sketch listing and exemplifying forty-three SENĆOŦEN lexical suffixes. Montler (1986:64–91), in his *Morphology and Phonology of Saanich, North Straits Salish*, lists and exemplifies fifty-eight lexical suffixes. Montler (1991) also includes lexical suffixes in his word list for Saanich. Another source for lexical suffixes, occurring specifically in place names, is Elliott (1983). Both Pidgeon (1970) and Montler (1986) provide a discussion of stress in their works. They both notice that stress tends to fall on the penultimate syllable. In addition Montler (1986:23) claims that stress is a highly complicated matter, and that it is necessary to distinguish classes of morphemes based on how they participate in stress assignment. He says that roots and suffixes compete for primary stress when concatenated in a word and the stronger of the two wins out. Montler (1986:23) recognizes three types of roots: strong, weak, and vowelless. He also recognizes four types of suffixes, strong, ambivalent,[28] weak and vowelless. Below I present the hierarchy referred to in Montler (1986:23).

(46) Morphological stress hierarchy for Saanich (based on Montler 1986:23)[29]

StgSfx >> StgRt >> AmbSfx >> WkRt >> WkSfx >> VlRt >> UnstrSfx

Kiyota (2003:7) agrees with Montler (1986:23) that stress is morphologically complex in SENĆOŦEN. However, in this paper, I argue that it is the phonological properties of roots and suffixes which determine their stress properties. For example, the quality of the vowel and the placement of a morpheme in the word are both factors which affect stress placement in SENĆOŦEN. As mentioned in section 1, there may in fact be some morpho-lexical stress present in SENĆOŦEN, which I will discuss in 4.4. However, I argue in this thesis that the amount of morpho-lexical stress present in the language is far less than previously thought.

For the other dialects of North Straits, various morphological and phonological sketches, including lists of lexical suffixes, have been produced; these include: *A Grammar of Non-particles in Sooke, a Dialect of North Straits Salish* (Efrat 1969); *A Phonology and Morphology of Songish, a Dialect of Straits Salish* (Raffo 1972); *A Phonology, Morphology and Classified Word List for the Samish Dialect of Straits Salish* (Galloway 1990).

4.1.3. The broader study of lexical suffixes in the Salish language family.

Lexical suffixes are found throughout the Salish language family (Kinkade 1998b:266). These morphemes have lexical content and thus seem similar to roots, but their meanings are much more restricted (usually they only refer to body-parts, environmental concepts, cultural objects and human terms) than meanings of true roots (or stems based on roots). In this last sense they are similar to affixes. These contradictions in their properties have been widely debated by Salishanists (Czaykowska-Higgins 2004:91). Some focus on their historical origins (Kinkade 1998a, Egesdal 1981, Mattina 1987, Carlson 1990), some on the types of meanings that they express (Hinkson 1999, 2002; Hinkson and Norwood 1997; Gerdts and Hinkson 1994, 1996, 2003) and others on the role that they play in sentence structure (Gerdts 1995, 1998, 2000, 2003, 2004; Czaykowska-Higgins, Willett and Bart 1996; Willett 2003). Preliminary investigations into the phonological and morphological properties of lexical suffixes have been undertaken for Musqueam, the downriver dialect of Halkomelem (Shaw et al. 1999; Shaw 2001, to appear), Lushootseed [a Coast Salish language] (Urbanczyk 2006), Lillooet [an Interior Salish language] (Blake 1998, 2000a), and Moses-Columbian [an Interior Salish language] (Czaykowska-Higgins 2004).

A number of different terms have been used to describe lexical suffixes. Kinkade (1998) explains that Sapir called them “verbal affixes that refer to nouns” (Sapir 1911:251). He says that Reichard called them “nominal suffixes” (Reichard 1938:601)

[28] This is Montler's term for the variable morphemes referred to in section 1. This type of morpheme is considered to lose stress to a strong morpheme but to attract stress from a weak morpheme.
[29] Stg=strong, Amb=ambivalent, Wk=weak, Vl=vowelless, Unstr=Unstressed, Sfx=suffix and Rt=Root.

and that Vogt used the term “field suffixes” (Vogt 1940:58). He also cites Kinkade (1963:352) as the first to use the term “lexical suffixes”, which he borrowed from Vogt, who had used the term to describe a “group of suffixes which modify the verb, by changing its syntactical functions or by adding various shades of meaning, as iteration, reciprocity, reflexivity etc” (Vogt 1940:56). The term lexical suffix is now used to describe the morphemes examined in this section.

4.2. Roots, lexical suffixes and stress.

In this section, I will examine the stress pattern of words which combine a root with a lexical suffix. Drawing from the examples listed in Montler (1986:65–91), I will show that the vast majority, over 70% of words of this type, can be accounted for with the analysis presented in section 3. In 4.2.1, I examine lexical suffixes with full vowels and in 4.2.2, I examine vowelless lexical suffixes.

4.2.1. Lexical suffixes with full vowels.

In examining combinations of roots and lexical suffixes which contain full vowels, I first look at monosyllabic lexical suffixes and then turn to the disyllabic ones.

4.2.1.1. Monosyllabic lexical suffixes with one full vowel.

In (47), I provide a list of monosyllabic lexical suffixes with a full vowel.

(47) Lexical suffixes with one full vowel

Lexical suffix	**Meaning**	**Lexical suffix**	**Meaning**
=wiɬ	canoe	=en	ear
=kʷat	clothing	=neč	tail
=aɬ	offspring	=ɬnel	throat
=eɬ	times	=as	face
=iqʷ	head	=sis	hand
		=ey̓	wood

Out of 67 words containing such suffixes found in Montler (1986), 49 (73%) conform to the basic stress pattern outlined in the previous section. When full vowel monosyllabic lexical suffixes concatenate with a root that has a full vowel, the root is stressed. This is to be expected as the two syllables are of equal weight and form a trochaic foot. Some examples are shown in (48).

(48) a. W̱ṮEḴTNEĆ xʷ-ƛ̓éqt=nəč[30] /xʷ-√ƛ̓eqt=neč/ (FN 2006)
LOC-long=(LS)TAIL
'Cougar'

b. W̱NÁJES xʷ-néč̓=əs /xʷ-√neč̓=as/ (FN 2006)
LOC-different=(LS)FACE
'He looks different'

The constraints which decide the optimal candidate are HEAD L and WSP′. Candidate (a) wins because it does not violate these constraints. As shown in section 3, disyllabic words with two full vowels always stress the first full vowel. This is because the language prefers to parse syllables into left-headed binary feet. To ensure that unstressed full vowels reduce to schwa it is necessary to rank WSP′ above MAX-μ.

(49) xʷ-ƛ̓éqt=neč 'cougar'[31]

μ μ xʷ-ƛ̓eqt=neč	WSP′	MAX-μ	DEP-μ	HEAD L	FT-BIN σ	PARSE σ
μ ☞ a. xʷ-(ƛ̓éqt. nəč)		*				
μ b. xʷ-(ƛ̓əqt. néč)		*		*!		
μ μ c. xʷ-(ƛ̓éqt=neč)	*!					

When full vowel monosyllabic lexical suffixes concatenate with a vowelless root the lexical suffix bears the stress, as shown in (50).

(50) a. ṈEN,ÁŁ ŋən̓=éɬ /√ŋn̓=eɬ/ (FN 2006)
many=(LS)TIMES
'Lots of times.'

b. ŁḴÁN ɬq̓=en /√ɬq̓=en/ (FN 2006)
one of a pair=(LS)EAR
'One of a pair of earrings.'

[30] Note that the first vowel is written E. This may be due to a lowering effect. A preliminary acoustic analysis has shown that e --> æ /_ q. I plan to carry out a more systematic study in the future.

[31] I propose that a highly ranked constraint such as STRESS CLASH would prevent a candidate like (ƛ̓ə́qt)(néč).

c. DEM,IḰ t̓əm̓=íqʷ /√t̓m̓=iqʷ/ (FN 2004)
hit=(LS)HEAD
'He got hit on the head.'

d. ȻEŦNÁĆT kʷəθ=néč-t /√kʷθ=neč-t/ (FN 2006)
tilt=(LS)TAIL-CTR
'He tilted it'

The lexical suffix bears the stress because it contains the only full vowel in the word. As discussed in section 3, stress in SENĆOŦEN is attracted to syllables with weight. The constraints at issue are MAX-μ, WSP′ and HEAD-L. In (51), Candidate (a) wins because it does not violate these constraints while candidate (b) loses because it violates MAX-μ. Candidate (c) is eliminated because it violates HEAD L. Candidate (d) is penalized for not reducing an unstressed full vowel. The fact that candidate (a) wins illustrates that it is more important to stress a full vowel than to maintain a well-formed foot structure.

(51) t̓əm̓=íqʷ 'he got hit on the head'

μ t̓əm̓=iqʷ	WSP′	MAX-μ	DEP-μ	HEAD L	FT-BIN σ	PARSE σ
μ a. t̓ə. (m̓íqʷ)					*	*
b. (t̓ə́. m̓əqʷ)		*!				
μ c. (t̓ə. m̓íqʷ)				*!		
μ d (t̓ə́. miqʷ)	*!					

In words which end in a full vowel monosyllabic lexical suffix and a monosyllabic grammatical suffix, stress falls on the lexical suffix, as in examples (52a–c). This is because the lexical suffix and the grammatical suffix constitute a left-headed binary foot. In words which have a full vowel root, stress is still attracted to the lexical suffix, as in example (52c). This is because left-headed binary feet are aligned to the right edge of the word.

(52) a. ŁEꝀSISTEN̲ ɬəq̓ʷ=sîs-t-əŋ /√ɬq̓ʷ=sis-t-ŋ/ (FN 2006)
slap=(LS)HAND-CTR-MID
‘He got slapped in the hand’

b. ŚQENOSEN̲ š-xʷ-k̓ʷən=ás-əŋ /š-xʷ-√k̓ʷn=as-ŋ/ (FN 2006)
S-LOC-see=(LS)FACE-MID
‘Mirror, window’

c. ȾEȻIḰEN̲ t̓ᶿəkʷ=îqʷ=əŋ /√ t̓ᶿekʷ=iqʷ-ŋ/ (FN 2006)
wash=(LS)HEAD-MID
‘She’s cleaning her hair.’

In order to formally account for the data in (52), I need to introduce another constraint which ensures that left-headed binary feet are aligned from the right edge of the word. This constraint is called ALIGN R and is defined in (53). In order to account for the data in (52) this constraint is ranked above MAX-μ.

(53) Align-R Align (Wd,R, Ft, R). The right edge of every word coincides with the right edge of some foot

The relevant constraints for this competition are ALIGN-R, MAX-μ and WSP′. In (54), candidate (a) wins. Candidate (b) loses because it violates ALIGN-R and candidate (c) loses because it violates MAX-μ twice. Candidate (d) is eliminated due to the fact that it has an unstressed full vowel in the output.

(54) t̓ᶿəkʷ=îqʷ=əŋ’ ‘She’s washing her hair.’

μ μ t̓ᶿ ekʷ=iqʷ=əŋ-[ACT]	ALIGN-R	WSP′	MAX-μ	DEP-μ	HEAD L	FT BIN σ	PARSE σ
μ ☞ a.t̓ᶿə. (kʷî. qʷəŋ’)			*				*
μ b.(t̓ᶿé. kʷə). qʷ=əŋ’	*!		*				*
c. t̓ᶿə. (kʷə. qʷə́ŋ’)			* *!		*		*
μ μ d. t̓ᶿ e. (kʷî. qʷəŋ)		*!					*

4.2.1.2. Disyllabic lexical suffixes with two full vowels.

There are only four lexical suffixes reported in Montler (1986) that contain two full vowels. One reason to suppose that these lexical suffixes have two underlying full vowels is that both vowels surface as full when stressed. Of the 27 example words that make use of these lexical suffixes, 22 (81%) conform to the stress analysis under discussion. In (55), I present the four lexical suffixes.

(55) Lexical suffixes with two full vowels

Lexical suffix	Meaning
=alas	eye
=aθin	mouth
=ew̓eč	bottom
=eleq	wave

When concatenated to a root with a full vowel, it is the lexical suffix which bears stress, as shown in (56). This is consistent with the analysis that left-headed binary feet are aligned with the rightmost edge of a word.

(56) a. T̲EK̲TOLES ƛ̓əqt=áləs /√ƛ̓eqt=alas/ (FN 2006)
long=(LS)EYE
'Oblong'

b. NEJOLES nəč̓=áləs /√neč̓=alas/ (FN 2006)
different=(LS)EYE
'Multicoloured'

c. ST̸EM,OŦEN s-t̓$^{\theta}$əm̓=áθən /s-√t̓$^{\theta}$am̓=aθin/ (FN 2006)
s-bone=(LS)MOUTH
'Cheek bone'

In (57) candidate (a) wins because it violates the fewest number of constraints. Candidate (b) loses because it violates ALIGN-R and candidate (c) is disqualified because it violates HEAD L. Candidate (d) fails to reduce two full vowels to schwas.

(57) ƛ̓əqt=áləs ‘oblong’

μ μ μ ƛ̓eqt=alas	ALIGN-R	WSP′	MAX-μ	DEP-μ	HEAD L	FT BIN σ	PARSE σ
μ ☞ a. ƛ̓əq. (tá. ləs)			* *				*
μ b. (ƛ̓éq. tə). ləs	*!		* *				*
μ c. ƛ̓əq. (tə. lás)			* *		*!		*
μ μ μ d. ƛ̓eq(t=álas)		**!					*

When a full vowel disyllabic lexical suffix is concatenated to a vowelless root, it is the first syllable of the lexical suffix that is predicted to take primary stress.

(58) a. DEM,OȾEN t̓əm̓=áθən /√t̓m̓=aθin/ (FN 2006)
hit=(LS)MOUTH
‘He got hit on the mouth.’

b. LEXOLES ləx̌=áləs /√lx̌=alas/ (FN 2006)
loose=(LS)EYE
‘Loose weave’

c. ṮȾ́OLES ƛ̓t̓^{θ}=áləs /√ƛ̓t̓^{θ}=alas/ (FN 2006)
tight=(LS)EYE
‘Tight weave’

In (59) candidate (a) wins. (b) loses because it violates HEAD L. (c) is eliminated because of incorrect alignment and (d) loses because it violates WSP′.

(59) ləx̌=áləs ‘pare/peel’

μ μ lx̌=alas	ALIGN R	WSP′	MAX-μ	DEP-μ	HEAD L	FT BIN σ	PARSE σ
μ ☞ a. lə(x̌á. ləs)			*				*
μ b. lə(x̌ə. lás)			*		*!		
c.(lə́. x̌ə). ləs	*!		* *				*
μ μ d. lə(x̌=álas)		*!					*

Stress shifts to the second syllable of a full vowel disyllabic lexical suffix when it concatenates with another suffix that surfaces with one syllable. Again, this is expected if we assume that left-headed binary feet are aligned from the right edge of the word. Some examples are provided in (60).

(60) a. ȻEXŦINEN̲ kʷəx̌=θín-əŋ[32] /√kʷx̌=aθin-ŋ/ (FN 2006)
tell=(LS)MOUTH-MID
‘He’s screaming’
b. ŁEPXELOSEN̲ ɬəpx̌=əlás-əŋ /√ɬpx̌=alas-ŋ/ (FN 2006)
blink =(LS)EYE-MID
‘He blinked’
c. EXŦINEN̲ SEN ʔəx̌=θín-əŋ sən /√ʔx̌=aθin-ŋ sn/ (FN 2006)
scrape=(LS)MOUTH-MID 1POSS
‘I shaved’
d. š-t̓$^{\theta}$əʔ=əwéč-ən /š- t̓$^{\theta}$eʔ=eweč-n/ (Montler 1986:89)
S-upon=(LS)BOTTOM-(LS)INST
‘Chair’

The examples which include the lexical suffix for *mouth* exhibit vowel syncope. I offer here a hypothesis for the vowel deletion: first, the vowel reduces because it is unstressed and second, it deletes because the two consonants on either side have no prohibition against clustering. The examples (b) and (d) do not involve vowel syncope. This is because the two consonants either side of the vowel do not form an allowable cluster.[33]

32 It is also possible that the /i/ is the persistent suffix which occurs with some imperfectives.

33 This is a slight simplification of the facts. There are some examples such as xʷ-t̓$^{\theta}$əkʷ=sə́n̓-əŋ’ *she's*

As discussed earlier, left-headed binary feet are built from the right edge, this is why in (61), candidates (b) and (c) lose. Candidate (d) loses because it violates MAX-μ twice. Candidate (e) is disqualified for its failure to stress a full vowel.

(61) kʷəx̌=θín-əŋ ‘He’s screaming’

μ μ kʷəx̌=aθin-əŋ	ALIGN-R	WSP′	MAX-μ	DEP-μ	HEAD L	FT BIN σ	PARSE σ
μ ☞ a. kʷəx̌. (θí. n-əŋ)			*				*
b. (kʷə́x̌. θə). nəŋ	*!		*				*
μ c. kʷə(x.̌ á. θə). n-əŋ	*!		*				* *
d. kʷəx̌. (θə. nə́ŋ)			**!		*		*
μ μ e. kʷə. x̌a. (θí. nəŋ)		*!					**

4.2.1.3. Disyllabic lexical suffixes with one full vowel.

Montler (1986) reports 13 lexical suffixes which surface with two syllables but that contain only one full vowel.

washing her hair, which do not delete the schwa. There are two possible explanations, 1) the schwa remains because the word is an imperfective form or 2) the schwa is breaking up a three consonant cluster. I leave this for future research.

(62) Disyllabic lexical suffixes with one full vowel

Lexical Suffix	Meaning	Lexical Suffix	Meaning
=ečən	waist	=eyəč	leg
=ečsəŋ	neck	=alən	fish
=iwəs	body	=amət	blanket
=eləʔ	container	=eɬsə	water
=əwič	back	=inəs	chest
=enkʷəs	stomach	=iqən	belly
		=aw̓əqʷ	bundle

From the 48 examples, which contain lexical suffixes in Montler (1986), 43 (89.5%) can be accounted for with the analysis used above. When concatenated to a root with a full vowel these suffixes are stressed, as shown in (63).

(63) a. QSIȻES k̓ʷs=íkʷəs /√k̓ʷes=iws/[34] (FN 2006)
singe=(LS)BODY
'He singed (the hairs off) the hide'

b. ṈESOMET ŋəs=ámət /√ŋas=amt/ (FN 2006)
four=(LS)BLANKET
'Four blankets'

c. STEM,INES s-t̓ᶿəm̓=ínəs /s-√t̓ᶿam̓=ins/ (FN 2006)
s-bone=(LS)CHEST
'Sternum'

This type of stress pattern is consistent with the analysis outlined so far. The lexical suffixes form a trochaic foot which is aligned to the right edge of the word. In this competition, candidate (a) wins. Candidate (b) is eliminated because it violates ALIGN-R and (c) is disqualified because it violates MAX-μ twice. Candidate (d) has an unstressed full vowel and so violates WSP′. Candidate (e) illustrates that is more optimal to delete the unstressed full vowel because when the schwa is present it incurs a violation of PARSE-σ.

[34] Montler (1986:75) says that the /w/ in this lexical suffix always surfaces as [kʷ] unless it is glottalized by the 'actual'. A schwa is inserted to prevent the word final illicit cluster kʷs from surfacing.

(64) k̓ʷs=íkʷəs ‘He singed (the hairs off) the hide.’

μ μ k̓ʷes=ikʷəs	ALIGN-R	WSP′	MAX-μ	DEP-μ	HEAD L	FT BIN σ	PARSE σ
μ ☞ a. k̓ʷ(sí. kʷəs)			*				
μ b. (k̓ʷé. sə). kʷəs	*!		*				*
c. k̓ʷ(sə. kʷə́s)			* *!		*		
μ μ d. k̓ʷe(s=í kʷəs)		*!					*
μ e. k̓ʷə(s=í kʷəs)			*				*!

As predicted, when concatenated with a vowelless root these kinds of lexical suffixes still attract stress. This is illustrated in (65).

(65) a. ĆḴIḴEN čq=íqən /√čq=iqn/ (FN 2006)
big=(LS)BELLY
‘He is big bellied.’

b. DEM,IḴEN SEN t̓əm̓=íqən sən /√t̓m̓=iqn/ (FN 2006)
hit=(LS)BELLY 1SUBJ
‘I got hit on the belly.’

c. ŁĆIȻES SEN ɬč=íkʷəs sən /√ɬč=iws/ (FN 2006)
tired=(LS)BODY 1SUBJ
‘I am tired’

d. TȻÁĆSEṈ tkʷ=éčsəŋ /√tkʷ=ečsŋ/ (FN 2006)
break=(LS)NECK
‘He broke his neck.’

In (66), candidate (a) wins because it only violates the lowest ranking constraint. Candidates (b) and (e) are eliminated due to a violation of MAX-μ and candidate (c) and (d) are excluded for their violation of ALIGN R.

(66) xʷ-t̓əm̓=íqən ‘get hit on the belly’

μ xʷ-t̓əm̓=iqən	ALIGN-R	WSP′	MAX-μ	DEP-μ	HEAD L	FT BIN σ	PARSE σ
μ ☞ a. xʷ. t̓ə. (m̓í. qən)							*
b. xʷ. t̓ə(. m̓ə. qə́n)			*!		*		*
c. xʷ. (t̓ə́. m̓ə). qən	*!		*				*
μ d. xʷ-(t̓ə́. m̓i). qən	*!	*					*
e. xʷ. t̓ə(. m̓ə́. qən)			*!				*

Before moving on to lexical suffixes with no full vowel, it is necessary to note that there are three lexical suffixes with only one vowel which pattern for stress purposes with the disyllabic lexical suffixes. Like the disyllabic lexical suffixes, these suffixes are always stressed when concatenated to a root, even if the root contains a full vowel.

(67) Lexical suffixes with one vowel which pattern with disyllabic lexical suffixes

Lexical Suffix	**Meaning**
=ew̓txʷ	building
=iɬč	plant
=ɬšeʔ	tens

(68) gives examples of full vowel roots with one of these three suffixes.

(68) a. SOW̱EȽÁUTW̱ saxʷəɬ=éw̓txʷ /saxʷɬ=ew̓txʷ/ (FN 2006)
grass=(LS)BUILDING
‘Barn’

b. ṈESŁŚÁ, ŋəs=ɬšéʔ /ŋas=ɬšeʔ/ (FN 2006)
four=(LS)TENS
'Forty'
c. SṈESIŁĆ s-ŋəs=íɬč /s-ŋas=iɬč/ (FN 2006)
four=(LS)PLANT
'Four trees'

The suffixes are also always stressed when concatenated with a vowelless root as in (69).

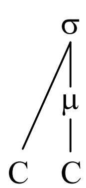
(69) a. ĆEḴÁU,TW̱ čəq=éw̓txʷ /čq=ew̓txʷ/ (FN 2006)
big=(LS)BUILDING
'Long house'

b. ŁḴEĆSŁŚÁ, ɬqə=čs=ɬšéʔ[35] /ɬq=čs=ɬšeʔ/ (FN 2006)
five=(LS)TENS
'Fifty'

c. ĆEṈ,IŁĆ čəŋ'=íɬč /čŋ'=iɬč/ (FN 2006)
adze=(LS)PLANT
'Oak tree'

Out of 15 occurrences of these types of lexical suffixes, 14 (93%) of them can be predicted if it is posited that the lexical suffixes themselves constitute a trochaic foot. This assumes that the lexical suffixes in (70) are made up of two syllables. Other Salishanists, namely Roberts(1993) and Shaw (1993), have proposed similar analyses. Roberts (1993), Roberts and Shaw 1994) and Caldecott (2006a) show that consonant clusters in St'at'imcets count as syllables for stress assignment. Shaw (1993:121) proposes that consonant clusters constitute their own syllable and that they have the following representation:

(70) Non-nuclear syllable



For the lexical suffixes *building* and *plant*, I assume that the segments /txʷ/ and /ɬč/ are counted as syllables and that they have the structure given in (70). Because this is the last syllable in the word, a trochaic foot is built with the preceding syllable. Further

[35] I assume that the lexical suffix ɬšeʔ contains two syllables. Shaw (2002) glosses the lexical suffix for *tens*, in Musqueam (Central Salish), in the following way: =əɬ=cye (=times=tens). I assume that the lexical suffix that Montler (1986) reports as *tens* for SENĆOŦEN is built in a similar way from the lexical suffixes /=eɬ/ *times* and /=šeʔ/ *tens*. Unfortunately, this still does not explain why the lexical suffix for *tens* is able to attract stress from the lexical suffix *times*. According to the analysis thus far, the two lexical suffixes should form a trochaic foot aligned to the right edge of the word and stress should fall on the lexical suffix /=eɬ/. The only way to account for the stress properties of this lexical suffix is to assume that the two lexical suffixes became fused. I assume that this lexical suffix is lexically specified as stress attracting.

evidence that /txʷ/ is a syllable can be found when looking at the lexical suffix meaning *round object/dollar* . Montler (1986:87) gives the underlying representation for this lexical suffix as /=ətxʷ/. The following examples at first glance suggest that the lexical suffix contains one syllable with a schwa as its peak.[36]

(71) a. ŋəs-él=ətxʷ /√ŋas-el-txʷ/ (Montler 1986:87)
four-CONN=(LS)DOLLAR
'four dollars'

b. ʔəpən-él=ətxʷ /√ʔpn-el=txʷ/ (Montler 1986:87)
ten-CONN=(LS)DOLLAR
'ten dollars'

However, I assume that the schwa in these examples is excrescent, because the consonants either side of the final schwa can be syllabified with the other vowels. I suggest that the lexical suffix has one syllable, [txʷ] with [xʷ] as its peak, not [ətxʷ] with [ə] as its nucleus.

In (72), I formalize the data from (68). First, I assume that the last segment in the input is moraic. Candidate (a) wins. Candidate (b) loses because it violates Align-R. Candidate (c), having a three syllable foot, loses because it violates FT BIN σ. Candidate (d) loses because it violates MAX-μ twice, as does Candidate (e) which also violates HEAD L. The fact that candidate (a) violates PARSE σ, means that we need to rank that constraint below FT FORM σ. Candidate (f) is not optimal because an unstressed full vowel is present in the output.

36 The data in (71) unfortunately have not been checked with a speaker. They are all from Monter (1986:87).

(72) s-ŋəs=íɬč ‘four trees’

μ μ μ s-ŋas-iɬč	ALIGN-R	WSP′	MAX-μ	DEP-μ	HEAD L	FT BIN σ	PARSE σ
μ μ ☞ a. s. ŋə. (sí. ɬč)			*				*
μ μ b. s. (ŋá. sə). ɬč	*!		*				*
μ μ c. s. (ŋá. sə. ɬč)			*			*!	
μ d. s. (ŋá. sə. ɬč)			**!				
μ e. s-(ŋəs-íɬč)			**!		*		
μ μ μ f. s-ŋa(s-íɬč)		*!					*

4.2.2. Lexical suffixes with no full vowel.

Next, I examine the stress pattern of lexical suffixes which do not contain a full vowel. These types of lexical suffixes surface in two ways: 1) the lexical suffixes with two consonants surface with one schwa and 2) the lexical suffixes with three consonants surface with two schwas. In 4.2.2.1, I examine the monosyllabic lexical suffixes and in 4.2.2.2, I investigate the disyllabic lexical suffixes. As in the previous sections, I show that the stress pattern of words which contain these kinds of lexical suffixes is predictable. One syllable lexical suffixes of this kind, when concatenated to a one syllable root will never bear stress. This is because they are the right hand member of a trochaic foot. However, two syllable lexical suffixes of this kind are always stressed. This is because they themselves constitute a trochaic foot which is aligned to the right edge of the word.

4.2.2.1. Monosyllabic lexical suffixes.

Montler (1986) reports 10 examples of two consonant lexical suffixes which surface with one schwa. These lexical suffixes are given in (73).

(73) Monosyllabic lexical suffixes which surface with a schwa

Lexical suffix	Meaning	Lexical suffix	Meaning
=čəp	fire	=qəč	small
=čəs	hand	=qən	hair
=kʷəɬ	torso	=qən	pharynx
=wən	mind	=əs	day
=ŋəxʷ	being	=sən	foot

Of the 42 example forms given in Montler (1986), 35 (83%) conform to the stress pattern discussed in this thesis. When concatenated with a full vowel root, it is the root which attracts stress. This is expected, because stress is attracted to weight in SENĆOŦEN and because feet are trochaic. Some examples are illustrated in (74).

(74) a. KOÍĆEP qʷáy=čəp /√qʷay=čp/ (FN 2006)
die=(LS)FIRE
'ashes, charcoal'

b. ŁIW̱S ɬíxʷ=s /√ɬixʷ=s/ (FN 2006)
three=(LS)DAY
'Wednesday'

c. ŁIȾSEN ɬit̓ᶿ=sən /√ ɬit̓ᶿ=sn/ (FN 2006)
cut=(LS)FOOT
'He got cut on the foot'

The lexical suffixes in (74) do not have a full vowel and thus have no weight associated to them. In (75), Candidate (a) wins because stress falls on the full vowelled root and thus violates no constraint. Candidate (b) loses because stress falls on the lexical suffix and thus violates MAX-μ. Candidate (c) is out because there is an unstressed full vowel in the output.

(75) qʷáyčəp ‘ashes’

μ qʷay=čəp	ALIGN-R	WSP′	MAX-μ	DEP-μ	HEAD L	FT BIN σ	PARSE σ
μ ☞ a. (qʷáy. čəp)							
b. (qʷəy. čə́p)			*!		*		
μ c. (qʷáy. čəp)		*!					

When these kinds of lexical suffixes are concatenated to a vowelless root it is the root that bears the stress. This is because the two syllables in the word are of equal non-weight and in such cases left-headed binary feet are constructed. Some examples are given in (76).

(76) a. DEM,NES t̓ə́m̓=nəs /√t̓m̓=ns/ (FN 2006)
hit=(LS)TEETH
‘He got hit on the teeth’

b. DEM,SEN t̓ə́m̓=sən /√t̓m̓=sn/ (FN 2006)
hit=(LS)FOOT
‘He got hit on the foot’

Candidate (b) is disqualified from the competition because it has an iambic foot, thus violating HEAD L.

(77) t̓ə́m̓sən ‘He got hit on the foot’

t̓əm̓sən	ALIGN-R	WSP'	MAX-μ	DEP-μ	HEAD L	FT BIN σ	PARSE σ
☞ a (t̓ə́m̓. sən)							
b. (t̓əm̓. sə́n)					*!		

These kinds of lexical suffixes are stressed if they are followed by a one syllable grammatical suffix. This stress pattern provides further evidence that it is more important to align trochaic feet to the right edge of the word than it is to stress a syllable with weight. When concatenated to a full vowelled root these lexical suffixes bear stress. This is because together with the following suffix they form a left-headed binary foot.

(78) W̱T̸EȻSEN,EṈ, SEN
xʷ-t̓ᶿəkʷ=sə́n̓-əŋ' sən /√xʷ-t̓ᶿekʷ=sn-ŋ sn/
LOC-wash[ACT]=(LS)FOOT-MID 1SUBJ
'I'm washing my feet.' (FN 2006)

In (79), candidate (a) wins because it violates the fewest number of constraints. Candidate (b) loses because it violates ALIGN-R and candidate (c) is eliminated because it violates HEAD L.

(79) xʷ-t̓ᶿ əkʷ=sə́n̓-əŋ' 'He is washing his feet.'

μ xʷ-t̓ᶿekʷ=sn-ŋ +[ACT	ALIGN-R	WSP′	MAX-μ	DEP-μ	HEAD L	FT BIN σ	PARSE σ
☞ a. xʷ. t̓ᶿ ə (kʷ. sə́ .n̓əŋ')			*				*
μ b. xʷ. (t̓ᶿékʷ. sə.)n̓əŋ'	*!						*
c. xʷ. t̓ᶿə (kʷ. sə. n̓ə́ŋ')			*		*!		*
μ d. xʷ-t̓ᶿe(kʷ. =sə́ .n̓əŋ)		*!					*

4.2.2.2. Disyllabic lexical suffixes with no full vowel.

Montler (1986) reports three disyllabic lexical suffixes which do not contain a full vowel. These lexical suffixes are presented in (80).

(80) Disyllabic lexical suffixes which surface with two schwas

Lexical suffix	**Meaning**
=ənəkʷ	ground
=əw̓sə[37]	fire
=əqsən	nose

Of the eight examples, which contain these types of lexical suffixes in Montler

[37] This suffix ends in a schwa. There are a number of SENĆOŦEN forms which end in schwa. This has been a long standing puzzle for Salishanists and I do not attempt to solve it here. I leave issues surrounding the status of this word final schwa for future research.

(1986), only two clearly conforms to the basic stress pattern for the language.

4.3. Apparent exceptions.

In this subsection, I discuss nine examples from Montler (1986) that at first glance appear not to follow the basic stress pattern outlined in section 3. However, I show that this analysis can in fact account for these forms. By assuming the presence, in SENĆOŦEN, of layered derivational structure and excrescent schwa, I show that the stress assignment of these examples is predictable.

This subsection is organised as follows. In 4.3.1, I look at forms which appear to have fixed middles. In 4.3.2, I look at forms with stacked lexical suffixes. In 4.3.3, I discuss examples which contain an excrescent schwa.

4.3.1. Fixed middles.

The two examples below at first glance appear not to conform to the basic stress pattern. Stress is expected to fall on the penultimate syllable but it is the ante-penultimate syllable that is stressed.

(81) a. W̱ENITEMḴEN SEN
xʷənîtəm=qən sən /√xʷnit-m=qn/ (FN 2006)
white man=(LS)PHARYNX 1SUBJ
'I speak English'

b. W̱KÁTXEMNEĆ
xʷ-q̓étx̌-əm=nəč /xʷ-qetxʷ-m-nč/ (FN 2006)
LOC-shake a rattle-MID=(LS)TAIL
'Rattle Snake'

In both cases, stress is predicted to be penultimate, however it is not. Both examples share in common a penultimate syllable with an /m/ coda. This syllable is glossed as the middle in one of the examples. /m/ is the middle suffix for other Salish languages; (for example, Hulq'umi'num' (Cowichan) another Coast Salish language) (Leslie 1979). As mentioned in Chapter 1, it has been argued that historically /-m/ became /-ŋ / in SENĆOŦEN (see Kuipers 2002), but examples such as (81a,b) suggest that there are remnants of proto /m/ in the synchronic grammar. I propose that synchronically a root and this historic middle suffix constitute their own phonological stem. This phonological stem is the domain for stress assignment. Left-headed binary feet are built from the right edge of this phonological stem. I further propose that when the lexical suffix is added to this phonological stem, stress remains faithful to the stress assignment of the phonological stem and that the second lexical suffix, in these examples, resides outside of this phonological stem. This is illustrated in (82).

(82) [xʷə(nîtəm)]=qən

An investigation of the phonological stem and the presence of layered derivational structure in SENĆOŦEN is beyond the scope of this thesis. Previous work investigating the phonological stem in Salish languages includes Czaykowska-Higgins (1998, 2004);

Dyck (2004); Bar-el and Watt (2000); Shaw (to appear).

4.3.2. Stacked lexical suffixes.

Root plus lexical suffix combinations which have more than one lexical suffix also do not always appear to follow the basic stress pattern outlined for SENĆOŦEN. The examples in (83) all have ante-penultimate stress.

(83) a. W̱SÁNEĆḴEN SEN
xʷ-sénəč=qən[38] sən /xʷ-√senč=qn sn/
LOC-Saanich=(LS)PHARYNX 1SUBJ
'I speak Saanich' (FN 2006)

b. NEŦÁLEṈEW̱ḴEN
nəθ-él̓=ŋəxʷ=qən /√nθ-el-ŋxʷ=qn/
?-CONN=(LS)BEING=(LS)PHARYNX
'Westcoast language' (FN 2006)

c. KETSENTEN
q̓ə́t=sən=tən[39] /√q̓t=sn=tn/
wrap around=(LS)FOOT=(LS)INST
'Dancer's leg wraps' (FN 2006)

d. X̱EṈ,ÁLEḴEN
x̌ʷəŋ'=éləq=ən /√x̌ʷŋ'=elq=n/
fast=(LS)WAVE=(LS)INST
'Swift tide'
(FN 2006)

The second lexical suffix acts as if it were not available for stress assignment, since it is never stressed. The reason for this is similar to the explanation given in section 4.3.1. The examples in (83) are all cases where the root and the first lexical suffix act as a semantic unit as well as a phonological unit. I propose that together they from a phonological stem, which is the domain for stress assignment, and that the second lexical suffix resides outside of this domain. The root and the first lexical suffix combined carry a specific meaning. The second lexical suffix serves to extend that meaning further. Stress within the phonological stem is predictable. Left-headed binary feet are built from the right edge of the phonological stem.

(84) xʷ-[(sénəč)] =qən

As mentioned above, I leave the investigation of the phonological stem and the presence of layered derivational structure in SENĆOŦEN for future research.

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38 Historically this word had the lexical suffix 'bottom' =nəč.
39 The instrumental suffix is considered to be a lexical suffix in many of the other Salish languages. In these examples I assume that to be the case for SENĆOŦEN.

4.3.3. Excrescent schwa.

In this section, I argue that a number of apparent exceptions can be accounted for by arguing for the presence of an excrescent schwa which does not count for stress.

In the examples below stress appears on the ante-penultimate syllable rather than the penultimate one. In all cases, one of the two schwas is not phonologically motivated. In (85) for instance, the occurrence of an /l/ next to a /t/ should be tolerated, as the /l/ can be syllabified as the coda of the preceding syllable and the /t/ can be syllabified as the onset of the following syllable. The fact that a schwa appears here, therefore, suggests it is transitional, rather than phonologically motivated. The excrescent schwa in question is underlined in the examples.

(85) DEꝀŁNÁLETEṈ t̓ik̓^{w}=ƚnél-ə̲t-əŋ /√t̓ik̓^{w}=ƚnel-t-ŋ/ (FN 2006)
choke=(LS)THROAT-CTR-MID
'He got strangled.'

In (86), again, there is no phonological reason for the schwa to surface between the /l/ and /q/.

(86) DEM,ÁLEḴSEN t̓əm̓-él=ə̲qsən /√t̓m̓-el=qsn/ (FN 2006)
hit-CONN=(LS)NOSE
'He got hit on the nose'

The /l/ can be syllabified as the coda to the preceding syllable and the /q/and /s/ form a legitimate word initial cluster, as shown in section 2, so there is no reason why they cannot form a legitimate cluster in this instance. For these reasons, I assume that the schwa between [l] and [q] is excrescent and as such has no phonological role in regards to stress assignment.

4.4. True exceptions.

The forms in (87) do not follow the stress pattern outlined for SENĆOŦEN.

(87) a. ŁȾIḰ ƚt̓^{θ}=íq^{w} /√ƚit̓^{θ}=iq^{w}/ (FN 2004)
cut=(LS)HEAD
'He, she, it cut the top off.'

b. ṈESÁŁ ŋəs=éƚ /√ŋas=eƚ/ (FN 2006)
four=(LS)TIMES
'four times'

c. ŁWÁŁ ƚx^{w}=éƚ /√ƚix^{w}=eƚ/ (FN 2006)
three=(LS)TIMES
'three times'

These types of forms are predicted to have stress on the first underlying full vowel. However, this is not the case. It may be that these lexical suffixes, or these particular words are in fact lexically specified for stress. In regards to example (87a), I found that the lexical suffix for *head* was always stressed regardless of the vowel quality of the root that it attached to (Leonard 2005). However, in this paper, I am focussing only on the predictable properties of SENĆOŦEN stress and leave these and other questions about the possible morpho-lexical nature of SENĆOŦEN stress for future research.

4.5. Section summary.

The purpose of this section was to demonstrate that the stress assignment of morphologically complex words involving lexical suffixes, can be accounted for without referring to the morphological hierarchy proposed by (Montler 1986:23). This section has shown that, for the most part, words which are formed from the concatenation of a root and lexical suffix conform to the basic stress pattern proposed for roots in section 3. I organised the lexical suffixes in terms of their surface shape and the quality of the vowel they contained. With the exception of the set that surface with two schwas, all of the combinations yielded a high percentage that conformed to the basic stress pattern. The conformity rate was between approximately 70%–90%.

I also proposed that although the lexical suffixes for *plant, building* and *tens* surface with only one full vowel, they should be considered disyllabic. This proposal is consistent with the hypothesis set forth in Roberts (1993) and Shaw (1993), that consonant clusters form their own non-nucleic syllable. Many of the apparent exceptional forms in Montler (1986) were explained straightforwardly, by taking into account factors such as layered derivational structure and excrescent schwa.

5. Conclusion.

In this paper, I have provided a first attempt at formalizing stress assignment in SENĆOŦEN. Drawing on previous work by Dyck (2004) and Kiyota (2003), I was able to show that for the majority of lexical stems, stress is predictable. First, in section 2, I showed that schwa in SENĆOŦEN is predictable in the sense that it serves to prevent illicit consonant clusters. In section 3, I examined the stress pattern of disyllabic roots, illustrating that feet are trochaic and full vowelled syllables attract stress over syllables which contain a schwa. Following Shaw et al. (1999), I proposed that schwa was both weightless and featureless in SENĆOŦEN. The constraint ranking needed to account for disyllabic roots was as follows:

(88) WSP′, MAX-μ, DEP-μ, HEAD L >> FT-BIN σ, PARSE σ

In section 4, I examined polymorphemic forms which have lexical suffixes. In previous literature, these forms were considered to be lexically specified for stress (Montler 1986:23). In this thesis, I was able to show that many forms of this type could be accounted for straightforwardly by aligning trochaic feet to the right edge of a word. These forms also highlighted the presence, in SENĆOŦEN, of layered derivational structure and excrescent schwas. All of these aspects of SENĆOŦEN grammar warrant further research. The revised constraint ranking needed to account for polymorphemic forms was as follows:

(89) ALIGN R>> WSP′>> MAX-μ, DEP-μ, HEAD L >> FT-BIN σ >> PARSE σ

The findings in this paper strongly suggest that there is less morphologically governed stress in SENĆOŦEN than was previously thought. However, only disyllabic roots and words with lexical suffixes were examined. In order to understand fully the stress system of SENĆOŦEN it is necessary to examine different types of morphemes present in the language. The next steps in accounting for stress in SENĆOŦEN are 1) to examine a much larger corpus of words and check these with speakers of SENĆOŦEN and 2) to find out if the stress pattern of other types of words can be accounted for by using the analysis presented in this thesis. The types of processes that need careful attention are reduplication, infixation, stress shift and metathesis. Much of SENĆOŦEN morphology utilizes these processes. Also, the language has many particles and clitics, whose role in stress assignment also warrants investigation if we are to determine how stress is assigned in SENĆOŦEN. This paper provides a crucial starting point for such a study.

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Appendix A

Dave Elliott Alphabet with Phonetic Equivalent

DEA[40]	***APA***	***IPA***	***DEA***	***APA***	***IPA***	***DEA***	***APA***	***IPA***
A	ɛ	ɛ	K	q̓	q’	Q	k̓^{w}	k^{w}’
Ⱥ	ey	ej	Ꝁ	q̓^{w}	qw’	S	s	s
Á	e	e	K̲	q	q	Ś	š	ʃ
B	p̓	p’	Ḱ	q^{w}	q^{w}	T	t	t
C	k	k	L	l	l	T̲	ƛ̓	tɬ’
Ć	č	tʃ	Ł	ł	ɬ	Ŧ	θ	θ
Ȼ	k^{w}	k^{w}	M	m	m	Ⱦ	t̓^{θ}~c̓	tθ’~ts’
D	t̓	t’	N	n	n	U	u~əw	u~əw
E	ə	ə	N̲	ŋ	ŋ	W	w	w
H	h	h	O	a	a	W̲	x^{w}	x^{w}
I	i	i	P	a	p	X	x̌	χ
Í	əy~ay	əj~aj				X̲	x̌^{w}	χ^{w}
J	č̓	tʃ’				Y	y	j
						Z	z	z

40 DEA=Dave Elliott Alphabet, APA=Americanist Phonetic Alphabet, IPA=International Phonetic Alphabet