Secwepemctsin (Shuswap) Reduplication*

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Much work on reduplication has invoked prosodic templates to define invariant shape of reduplicants (McCarthy and Prince 1986, 1990). However, such a prosodic approach cannot define the shape of the diminutive reduplicant (RED) in Shuswap by any prosodic template since the diminutive RED consists of a single consonant and does not form any prosodic unit. Against a theory that heavily depends on prosodic templates, I will argue that reduplication-specific templates are not necessary to define the shape of reduplicants. Adopting an a-templatic approach known as 'Generalized Template' theory (McCarthy and Prince 1994a, 1994b), the invariant shape of distributive and diminutive reduplicants in Shuswap can be derived from interactions of prosodic well-formedness constraints and constraints on reduplication identity.

1 Introduction

Secwepemctsin (Shuswap), an Interior Salish language of British Columbia[1] marks 'plurality' of items or participants of the event by copying the first two consonants of a stem with a schwa in vocalic position of the reduplicant. This type of reduplication is called *'distributive reduplication'*. It applies to both nominal and verbal predicates, as shown in (1) and (2).[2]

(1)	*Nominal*			
	pəs-pésəɬkʷe	'lakes'	pésəɬkʷe	'lake'
(2)	*Verbal*			
	kəc-kícx-ekʷe	'they arrive'	kícx-ekʷe	's/he arrives'
			kícx	'to arrive'
				(Kuipers 1974)

Shuswap also marks "smallness" of items by copying a consonant of a stem, as shown in (3). This reduplication pattern is usually called *'diminutive reduplication'*. The same reduplication pattern is also used to express the first person singular verb form ('I') and possessive form ('my'), as shown in (4).

(3)	*Diminutive*			
	pé-p-səɬkʷe	'little lake'	pésəɬkʷe	'lake'
				(Bell 1982)
(4)	*First person singular*[3]			
	né-n-s-ken	'I go.'	nes	'to go'
	ɣ n-s-kʷé-kʷ-st[4]	'my name'	s-kʷest	'name'
				(Kuipers 1974)

These two patterns of reduplication raise an interesting theoretical issue of how the invariant shape of reduplicant (RED), namely, CVC-shape of the distributive RED and C-shape of the diminutive RED, is defined. Much work on reduplication since McCarthy and Prince (1986) has proposed that prosodic factors play an important role in conditioning the shape of reduplicants. That is, the size of reduplicants are

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[1] Secwepemctsin has a number of different reduplication patterns. The distributive and diminutive reduplications are the most productive patterns. See Kuipers (1974) for the descriptive details. All the data cited here are from Kuipers (1974) and Bell (1982).

[2] The reduplicative morphemes are underlined throughout this paper.

[3] The use of "diminutive reduplication" in the first person singular forms is an old gesture of modesty (Kuipers 1974).

[4] /ɣ/ (written as 're' in the orthography) is a determiner and 'n' is a first person possessive marker.

restricted by prosodic templates such as RED=μ, σ, Foot, PWord, etc. However, purely prosodic approach fails to define the invariant shape of Shuswap diminutive reduplicant by any prosodic template, since it consists of a single consonant that does not form any authentic prosodic units.

Against an analysis that crucially depends on prosodic templates (McCarthy and Prince 1986, etc), it will be argued here that prosodic templates are not always necessary to define the shape of reduplicants and hence can be eliminated. This paper provides an analysis of Shuswap distributive and diminutive reduplications in the framework of Optimality Theory (McCarthy & Prince 1993a,b, 1994, Prince & Smolensky 1993). As suggested by Generalized Template Theory (Gafos 1995, McCarthy and Prince 1994, 1999, Spaelti 1997, Urbanczyk 1996), it will be shown that the correct shape of distributive and diminutive reduplicants can be derived from interaction of constraints among independently motivated constraints.

This paper is organized as follows. Section 2 introduces the basic principles of Optimality Theory adopted in this analysis and the Optimality-Theoretic notion of correspondence, which has been successfully employed to characterize the cross-linguistic facts of reduplication. This notion will play a central role in the analyses throughout this paper. Section 3 provides the basic patterns of distributive and diminutive reduplications in Shuswap. Then sections 4 and 5 present an OT analysis of each reduplication pattern. It will be shown that all aspects of size /shape, positions, and segmental contents of the reduplicants result from the constraint interaction.

2 Optimality Theory and correspondence

The central claim of Optimality Theory (OT) is that phonological outputs are not derived from the interaction of ordered rules. Within OT, outputs are freely generated and the role of a grammar is to select the actual output, the one which is most optimal given the ranking of the relevant constraints in that language, from among a wide range of those candidates. While constraints are assumed to be universal, constraint-rankings are language particular, so that interlinguistic variation may be accounted for by ranking the same constraints in different orders. These principles are summarized in (5) (McCarthy & Prince 1993a,b; 1994; Prince & Smolensky 1993):

(5) Principles of Optimality Theory

(a) *Universality*: UG provides a set Con of constraints that are universal and universally present in all grammars.

(b) *Violability*: Constraints are violable, but violation is minimal.

(c) *Ranking*: Constraints are ranked on a language-particular basis; the notion of minimal violation is defined in terms of this ranking. A grammar is a ranking of the constraint set.

(d) *Inclusiveness*: The constraint hierarchy evaluates a set of candidate analyses that are admitted by very general considerations of structural well-formedness.

In OT the fact that related grammatical forms such as Input/Output and Base/Reduplicant tend to be identical is expressed by "faithfulness". In this paper, I assume that the faithfulness is formalized as in McCarthy and Prince (1995a) by introducing the notion of 'correspondence'. Correspondence is a relation between two forms, defined as in (6) below:

(6) *Correspondence*:

Given two segmental strings S_1 and S_2, *correspondence* is a relation *R* from the segments of S_1 to those of S_2. Segments α of S_1 and β of S_2 are related to as *correspondents* of one another when $\alpha R \beta$.

A correspondence relation imposes a number of constraints requiring the two related segmental strings be identical. Two basic constraints for the Base/Reduplicant correspondence relation, which will be important in the analyses, are given in (7) and (8) (McCarthy & Prince 1995a):[5]

[5] An independent set of the same constraints holds for the Input/Output correspondence relation, namely, MAX-IO and DEP-IO.

(7) MAX-BR
Every segment of the base has a correspondent in the reduplicant.

(8) DEP-BR
Every segment of the reduplicant has a correspondent in the base.

Total reduplication results from perfect correspondence, which fully satisfies both MAX-BR and DEP-BR. Perfection is deviated when the reduplicant copies less than the whole base, violating MAX-BR, or when the reduplicant contains segments which are not part of the base, violating DEP-BR, in order to satisfy certain higher-ranked constraints. Both cases of violation correspond to well-attested phenomena, partial reduplication and prespecified reduplication respectively.

In Shuswap reduplication, for example, the distributive form $\underline{C_1V_1C_2}$- $C_1V_1C_2V_2C_3$, derived from the base $C_1V_1C_2V_2C_3$, copies (segmentally) only the first three elements from the base, causing two violations of MAX-BR because /V_2C_3/ are not copied.

An other constraint evaluates the quality of the identity between correspondent segments over the featural dimension, as in (9) (McCarthy and Prince 1993a).

(9) IDENT-BR (F)
Reduplicant correspondents of a base segment are featurally identical to that segment.

Featural identity may be violated because of higher-ranked constraints imposing specific demands on the featural make-up of a correspondent segment. In Shuswap, a vocalic position of the distributive morpheme is always realized as a schwa, avoiding a full vowel of the base from being realized in the RED. It will be argued later in this paper that violation of IDENT-BR[F] is forced to satisfy a higher ranked constraint V-PLACE which penalizes marked vocalic features.

3 Basic Patterns of Distributive and Diminutive Reduplications

This section provides the basic patterns of distributive and diminutive reduplications in Shuswap. First we will explore distributive reduplication where the reduplicant exhibits a CVC shape and is prefixed to the base (§3.1). Then we will observe another reduplication, namely, diminutive reduplication in which the reduplicant consists of a single consonant and is infixed to the base (§3.2).

3.1 Distributive reduplication

Shuswap exhibits distributive reduplication to mark 'plurality' of items or participants of the event, applying to both nominal and verbal predicates. The distributive morpheme always exhibits a CVC-shape. Its segmental content consists of a copy of the first two consonants of the root and a schwa in its vocalic position. As shown in (10) and (11) below, no matter what kind of vowels appear in the first vowel of the base, the reduplicant always realizes its vocalic position as a schwa. The distributive reduplicant is a prefix to the root.

(10) *Nominal*

a. Schwas in Root [$C_1əC_2$]

s-təX-t'əX-ʔem	'grown-up people'	s-t'əX-ʔem	'grown-up person'
ləX-ləXkíXkst	'fingers'	ləXkíXkst	'finger'
t-kət-kət'múy'e	'eyebrows	t-kət'múy'e	'eyebrow'

b. Full vowels in Root [C_1VC_2]

pəs-pésəɬk^we	'lakes'	pésəɬk^we	'lake'
s-xən-xénx	'stones'	s-xenx	'stone'
cək-cikn	'chickens'	cikn	'chicken'

	c. No vowels in Root [C_1C_2]			
	tk-cək^{w}-ck^{w}ewt	'mountain ridges'	tk-ck^{w}ewt	'mountain ridge'
	cəq-cq'éɬp	'fir trees'	cq'éɬp	'fir tree'
(11)	*Verbal*			
	kəc-kícx-ek^{w}e	'they arrive'	kícx-ek^{w}e	's/he arrives'
	c-yəm-yem	'several groups are home/camped'	c-yem	'to be home/camped'
				(Kuipers 1974)

3.2 Diminutive reduplication

Shuswap also exhibits diminutive reduplication to mark "smallness" of items. As shown in (12), the diminutive morpheme always has a C-shape, which consists of a consonant that immediately precedes a stressed vowel. It is a suffix to the stressed vowel. consonant that immediately precedes a stressed vowel.

(12)	s-qá-**q**-ləmX^{w}	'little man'	s-qáləmX^{w}	'man'
	sqé-**q**-X'e	'little dog'	sqéX'e	'dog'
	pé-**p**-səɬk^{w}e	'little lake'	pésəɬk^{w}e	'lake'
	spe-**p**-lem	'little field'	spelem	'open field'
	ci-**c**-tX^{w}	'little house'	citX^{w}	'house'
				(Bell 1982)

The same reduplication pattern is also used to express the first person singular verb form ('I') and possessive form ('my'), as shown in (13).

(13)	a. First person singular verb form			
	né-**n**-s-ken	'I go'	nes	'to go'
	yé-**y**-wem-ken	'I fish'	yéwem	'to fish'
	sec^{w}e-**c^{w}**-pmec-ken	'I am Shuswap'	sec^{w}epmec	'Shuswap'
	cetcé-**c**-t-ken	'I am active'	cetcét	'active'
	b. First person possessive form			
	ɣ n-tmi-**m**-x^{w}	'my land'	tmix^{w}	'land'
	ɣ n-s-k^{w}é-**k^{w}**-st	'my name'	s-k^{w}est	'name'
	ɣ n-pu-**p'**-smen[6]	'my heart'	p'usmen	'heart'
	ɣ n-ské-**k'**-pqen	'my head'	sk'épqen	'head'
				(Kuipers 1974)

Let us now turn to an analysis of the two reduplications in Shuswap within an Optimality Theory Framework. First, distributive reduplication is accounted for in terms of the invariant shape, segmental content and position of the reduplicant in section 4, then the diminutive reduplication in section 5.

4 Analysis of Distributive reduplication

This section provides an account for distributive reduplication in OT framework. As we observed in the previous section, the distributive reduplicative morpheme (RED) is a prefix, which exhibits an invariant CVC-shape. Its segmental content consists of a copy of the first two consonants of the base and contains a schwa in its vocalic position. First, I will account for the prefixal position of RED in §4.1. Then in §4.2 I will show how the invariant CVC shape of the RED is derived. Lastly in §4.3 I will propose an analysis of a fixed segment schwa in vocalic position of the RED, which I call '*fixed segmentism*'.

[6] Diminutive reduplication accompanies 'deglottalization'. In Shuswap, there can be only one glottalized obstruent within a word. If reduplication creates more than one glottalized obstruent, then the first glottalized obstruent is always deglottalized. That is, in the diminutive reduplication, if a consonant of the base is glottalized, it gets deglottalized, but the reduplicative consonant is glottalized.

4.1 Position

To define the position of reduplicative morphemes, I will adopt the theory of Generalized Alignment (GA) (McCarthy and Prince 1993a, 1994). The central claim of GA is that prosodic and morphological constituent edges optimally line up with each other. That is, alignment constraints formalize this requirement by specifying which two constituents share an edge and which edge they share:

(14) *Generalized Alignment*
Informally, alignment constraints require constituents to share edges; alignment constraints have the form: ALIGN (Cat1, Edge1, Cat2, Edge2), where Cat1, Cat2 are either prosodic or grammatical categories, and Edge1, Edge2 are either the right or left edge.

What alignment constraints do is to allow us to define affixes as subcategorizing for either morphological or prosodic constituents. The distributive reduplicant is always prefixed to the root. Analyzing reduplicative morphemes as affixes, the position of the distributive RED can be captured by the alignment constraint in (15a), ensuring the representation in (15b) (McCarthy and Prince 1993).

(15) a. ALIGN (DIST, R, Root , L)
The right edge of every distributive morpheme coincides with the left edge of the root.

b. DIST][Root

This constraint is highly ranked in this language since an actual output never violates it. Let us take a look at the following tableau in (16).[7]

(16)

/DIST-pésəɬkʷe/	ALIGN (DIST, R, Root, L)
☞ a. pəs-[pésəɬkʷe]	
b. [pésəɬkʷe]-pəs	*!
c. [pés]-pəs-[əɬkʷe]	*!

Candidate (16a) is an actual output, where the right edge of the distributive RED is aligned with the left edge of the root, satisfying the alignment constraint. Candidates (16b&c) are ruled out since the distributive RED in both cases violate the alignment constraint; in (16b) the left edge of the RED is aligned on the right edge of the root, and in (16c) the RED is aligned between segments of the base.

4.2 Shape

The distributive reduplicant always exhibits a CVC shape as in (17a). It is never larger nor smaller than CVC, as shown in (17b&c).

(17) /pésəɬkʷe/ 'lake' a. pəs-[pésəɬkʷe] 'lakes'
b. *pesəɬkʷe-[pésəɬkʷe]
c. *pə-[pésəɬkʷe]

In (17b), the reduplicant copies all the segments of the base, that is, reduplication is a perfect copy. However, this is not the case in Shuswap distributive reduplication. The shape/size of the reduplicant is somehow restricted.

In many works on reduplication, an invariant shape of reduplicants is often captured by invoking "prosodic templates" such as RED= μ, σ, Foot, PWord, etc (McCarthy and Prince 1986). In such an

[7] The Base for the reduplication is indicated by square brackets and the reduplicants are underlined.

approach, the CVC shape of the distributive RED can be defined by a prosodic template RED=σ in (18).

(18) RED_{DIST}=σ
The distributive reduplicant must be a syllable.

This reduplication-specific templatic constraint can capture the CVC shape of the distributive RED. However, this templatic constraint can also be replaced by a non-reduplication-specific constraint. Generalized Template Theory (GT) (McCarthy and Prince 1994, Urbanczyk 1996, 1999) claims that reduplication-specific constraints such as prosodic templates can be eliminated, and reduplicative morphemes are only specified for morphological category, either a root or affix. All aspects of the size, shape, and segmental content are determined by constraint interaction. Adopting McCarthy and Prince (1994), I assume that reduplicants are equal to an affix or stem and subject to size and weight restriction and evaluated against a constraint given in (19):

(19) AFFIX ≤ σ
The phonological exponent of an affix must be no larger than a syllable.

The central idea of Generalized Template theory is that template specification is minimal. Notice that a constraint like RED=σ in (18) is reduplication-specific, whereas the one in (19) is not restricted to reduplication but to any affixes, which reduces the number of reduplication specific mechanisms present in the grammar. In the next section, we will actually see that the constraint AFFIX ≤ σ can account for the shape of diminutive reduplicant, whereas prosodic templatic constraints cannot. We will come back to the necessity of templatic constraints and discuss in more details later.

This constraint crucially dominates the faithfulness constraint MAX-BR which enforces full/perfect copying.

(20) MAX-BR
Each segment of the Base must have a correspondent in the RED.

Ranking AFFIX ≤ σ above MAX-BR ensures that the distributive reduplicant has a CVC-shape. The analysis is exemplified in the following tableau (21).

(21)

/DIST-pésəɬkʷe/	AFFIX ≤ σ	MAX-BR
☞ a. <u>pəs</u>-[pésəɬkʷe]		****
b. <u>pesəɬkʷe</u>-[pésəɬkʷe]	*!	
c. <u>pə</u>-[pésəɬkʷe]		*****!

Candidate (21b), which contains a perfect copy of the base in the RED, satisfies MAX-BR. However, this candidate is ruled out by AFFIX ≤ σ, since the reduplicant is greater than a syllable. Both candidate (21a) and (21c) satisfy AFFIX ≤ σ: the RED in (21a) has a CVC-shape and the RED in (21c) has a CV shape. However, candidate (21c) is ruled out because of five violations of MAX-BR since the base lacks five corresponding segments to those in the RED. Due to the less number of MAX-BR violations than that of (21c), the actual output (21a) is selected as optimal over (21c).

4.3 Segmental Content/Fixed Segmentism

The constraints and their ranking established above account for the CVC shape of the distributive RED, but cannot capture why the RED always contains a fixed segment *schwa* in vocalic position. The distributive RED copies the first two consonants of the base, but it never copies a full vowel of the base. Instead, a vocalic position of the reduplicant (CVC) is always realized as schwa. This fixed segmentism is generally motivated by the Emergfence of the Unmarked, analyzed by ranking a markedness constraint over BR-

Faithfulness constraint (Alderete et al. 1999). In order to account for the fixed segmentism observed in Shuswap distributive reduplication, I propose that a place-markedness constraint with respect to the vocalic place features defined in (22) is ranked above BR-faithfulness constraints (Prince and Smolensky 1993, Lombardi 1996).

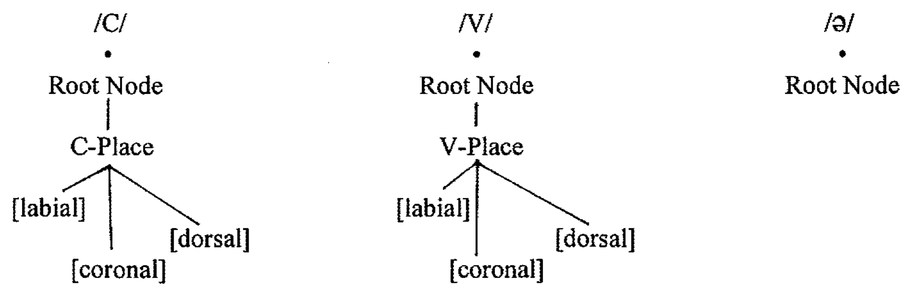
(22) V-PLACE

*PL/LAB, *PL/DORS >> *PL/COR >> *PL/PHAR

*u, o *i, e *a

Following Clements (1985), Archangeli and Pulleyblank (1986) , Sagey (1986), and others, I assume that vowels have the feature hierarchy just like consonants. Unlike full vowels (/a, e, i, o, u, etc./), I assume that schwa is featureless, that is, there is no place feature for schwa. The feature hierarchy is represented in (23):

(23) a. Consonants b. Full vowels c. Schwa



Assuming that a schwa is featureless, the place-markedness constraint V-PLACE is irrelevant to schwa.

The place-markedness constraint in (22) is crucially ranked above the BR-faithfulness constraint IDENT-BR[F] in (24):

(24) IDENT-BR[F]

Reduplicant correspondents of a base segment are featurally identical to that segment.

The following tableau in (25) illustrates how the ranking of V-PLACE above IDENT-BR [F] can account for the fixed segmentism of a schwa in the distributive reduplicant.

(25)[8]

/DIST-pésəɬkʷe/	V-PLACE	IDENT-BR[F]
☞ a. <u>p ə s</u>-[p é s ə ɬ kʷ e] • • • • VP VP	**	* (ə<->e)
b. <u>p e s</u>-[p é s ə ɬ kʷ e] • • • • VP VP VP	***!	

The ranking of V-PLACE >> IDENT-BR[F] ensures that the addition of marked vocalic features in the output is blocked. Candidate (25b) contains a Base vowel /e/ in the RED and satisfies IDENT-BR[F], but it is ruled out by having three marked V-Place features. A full vowel in the RED exhibits a marked-place

[8] In the tableau, "•" indicates a root node of a segment and VP stands for a V-Place feature. Root nodes for consonantal segments and their C-Place features are not crucial in the present analysis and hence not represented in the tableau throughout this paper.

feature, so that it violates V-PLACE. Whereas the actual output (25a) only incurs two violations of V-PLACE since a schwa in the RED does not violate V-PLACE, therefore it is correctly selected as optimal.

4.4 Summary

In this section, I have analyzed all aspects of the shape, segmental contents, and position of the distributive reduplicant. The total ranking of the constraints that has been established for the distributive reduplication is given in (26).

(26) ALIGN (DIST, R, Root, L), AFFIX $\leq \sigma$ >> V-PLACE >> MAX-BR >> IDENT-BR[F]

Additional tableaux are provided to show that the present analysis can also account for cases where the base vowel is originally a schwa but not a full vowel as in (27), and where there are no vowels between the first two consonants of the base as in (28):

(27) (ləX- ləXkíXkst 'fingers' [ləXkíXkst 'finger'])

/DIST-ləXkíXkst /	ALIGN (DIST, R, RT, L)	AFFIX $\leq \sigma$	V-PLACE	MAX-BR	IDENT-BR[F]
☞ a. <u>l ə X</u> –[l ə X k í X k s t] • • • VP			*	***** (kíXkst)	
b. <u>l V X</u> –[l ə X k í X k s t] • • • VP VP			**!	***** (kíXkst)	* (ə<->V)

Candidate (27b) is ruled out by having a full vowel [V] in the RED, which has a marked-place feature and incurs a violation of V-PLACE. This candidate also violates IDENT-BR[F] since a schwa in the base is not featurally identical to its correspondent.

The next tableau illustrates an account for the case where the base does not have any vowels between the first two consonants.

(28) (<u>cəq</u>-cq'eɬp 'fir trees' [cq'eɬp 'fir tree'])

/DIST-cq'eɬp/	ALIGN (DIST, R, RT, L)	AFFIX $\leq \sigma$	V-PLACE	MAX-BR	IDENT-BR[F]
☞ a. <u>cəq</u>-[cq'eɬp] • • VP			*	*** (eɬp)	
b. <u>cq</u>-[cq'eɬp] • VP		*!	*	*** (eɬp)	

Candidate (28b) crucially violates a constraint AFFIX $\leq \sigma$ since the RED which consists of two consonants does not form a syllable.

We now turn to an OT analysis of the diminutive reduplication in the next section.

5 Analysis of Diminutive Reduplication

In the previous section, I have shown that the shape of distributive reduplicant (CVC) results from ranking AFFIX $\leq \sigma$ above MAX-BR, forcing the phonological exponent of the RED to be no larger than a syllable. I have argued that reduplication-specific templates are not necessary to define the shape of the RED. This section investigates diminutive reduplication and provides an evidence for this argument. I will show that the shape of the diminutive reduplicant, which consists of a single consonant, cannot be captured by a prosodic templatic theory. Like the distributive RED, the diminutive RED can also be derived from constraint interaction without invoking reduplication-specific templates.

This section is structured as follows. First, §5.1 provides an account of the prefixal position of the RED by invoking an alignment constraint. § 5.2 discusses why prosodic templates are not possible to define the shape of diminutive RED. §5.3 presents an account of the correct shape and segmental content of the diminutive RED. Finally, §5.4 presents an OT account of schwa epenthesis which is accompanied with diminutive reduplication.

5.1 Position

Diminutive reduplicants always appear immediately after a stressed vowel. This generalization can be captured by an alignment constraint defined in (29a), ensuring the representation in (29b).

(29) a. ALIGN (DIM, L, V', R)
The left edge of every diminutive morpheme coincides with the right edge of the stressed vowel. (McCarthy and Prince 1993)

b. V'][DIM

Given this alignment constraint, the diminutive reduplicant is defined as a prosodically positioned affix. This alignment constraint is highly ranked in this language since it is never violated by actual outputs, as shown in (30).

(30)

/ pésəɬkʷe /-DIM	ALIGN (DIM, L, V', R)
☞ a. [pé]-p̲-səɬkʷe	
b. [pés]-p̲-əɬkʷe	*!

Candidate (30a) satisfies the alignment constraint; the left edge of the diminutive morpheme coincides with the right edge of the stressed vowel, and hence it is selected as optimal. Candidate (30b), on the other hand, is ruled out since the left edge of the diminutive morpheme coincides with the right edge of the stressed *syllable* but not a stressed *vowel*.

5.2 Why prosodic templates are not possible

In prosodic approach, reduplicants are defined by certain prosodic templates such as RED=σ, Ft, PWord, etc. Such an approach can (or must) define the diminutive reduplicant, consisting of a single consonant, by only a prosodic template RED=μ, since it is the only possible prosodic unit for a single consonant. Suppose that the diminutive RED is constrained by RED=μ. Then we would predict that the reduplicative consonant can only appear in coda position, which can be moraic. It would not appear in onset position, since onset position cannot be moraic. Hoever, this prediction is not borne out since the reduplicative consonant *does* appear in onset position, as shown in (31) (the reduplicative consonant is underlined).

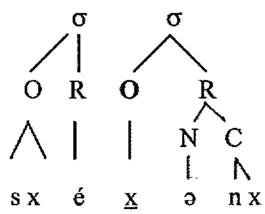
(31)

s-xé-x̲ənx	'pebble, little stone'	s-xenx	'stone'
clé-l̲əm-ken	'I bite'	clem	'to bite'
lelú-l̲əmt-ken	'I suspect'	lelumt	'to suspect'
ɣ n-smé-m̲ənx	'my tobacco'	smenx	'tobacco'
ɣ n-ké-k̲əlx	'my hand'	kelx	'hand'

(Kuipers 1974)

Kuipers (1974) provides a descriptive generalization that a schwa is epenthesized before resonants when they occur in vocalic position. Thus when diminutive reduplication creates an environment K_1RK_2, where K and R stand for obstruent and resonant respectively, a schwa appears between the reduplicative consonant K_1 and a resonant R. In such cases, the reduplicative consonant is syllabified as onset. To be more precise, let us look at the syllabification of a word for *s-xé-x̲ənx* 'pebble, little stone' illustrated below:

(32)



Besides this fact, there is no evidence that coda consonants are moraic in Shuswap. For instance, in this language the stress assignment is not quantity-sensitive, and also there are no geminates nor long vowels. Given that the diminutive RED cannot be defined by any prosodic templates, I will propose an account for Shuswap diminutive reduplication without invoking any prosodic templates in the following section.

5.3 Segmental Content

The diminutive reduplicant (RED) consists of a single consonant as in (33a). It never copies a full vowel of the Base (/e/), as shown in (33b). Even a schwa does not appear in the RED, as shown in (33c).

(33)	/pésəɬkʷe/	'lake'	a.	[pé]-p̲-səɬkʷe	'small lake'
			b.	*[pé]-p̲e̲-səɬkʷe	
			c.	*[pé]-pə-səɬkʷe	

The absence of full vowels in the RED can be captured by the place-markedness constraint, which was proposed for the fixed segmentism of the distrubutive reduplicant (see the discussion on a fixed schwa /ə/ in vocalic position in §4.3). This markedness constraint is repeated in (34).

(34) V-PLACE (Prince and Smolensky 1993, Lombardi 1996)
*PL/LAB, *PL/DORS >> *PL/COR >> *PL/PHAR
*u, o *i, e *a

This constraint crucially dominates BR-faithfulness constraint MAX-BR, ensuring that the addition of segments that contain marked V-place features in the output is blocked.

(35) MAX-BR: Every segment of the Base has a correspondent in the RED.

The analysis is shown in the tableau (36): candidate (36b) that contains a copy vowel of the Base (/e/) in the RED is ruled out by having more violations of V-PLACE than candidate (36a) that contains no vowels in the RED.

(36)

pésəɬkʷe -DIM	V-PLACE	MAX-BR$_{DIM}$
☞ a. [p é]-p̲-sə ɬ kʷ e VP VP	**	* (e)
b. [p é]- p̲ e̲- s ə ɬ kʷ e VP VP VP	***!	

Recall that a schwa is assumed to be featureless. Therefore if an output contains a schwa in the reduplicant, it does not incur any violation of V-PLACE. This makes a wrong prediction, since candidate which contains a schwa in the RED is selected as optimal rather than the actual output. Let us look at the tableau in (37).

(37)

pésəɬkʷe -DIM	V-PLACE	MAX-BR$_{DIM}$
a. [p é]- p̱ -s ə ɬ kʷ e • • • VP VP	**	*! (e)
☞ 💣 b. [p é]- p̱ə̱- s ə ɬ kʷ e • • • • VP VP	**	

Candidate (37a), an actual output, cannot be optimal since it violates MAX-BR due to the lack of a correspondent to the Base vowel. On the other hand, candidate (37b) does not violate MAX-BR and hence becomes optimal.

In order to optimize an actual output (37a), I propose that a faithfulness constraint IDENT-BR[F] in (38) which evaluates the identity of corresponding feature dominates MAX-BR which evaluates the segmental correspondence.

(38) IDENT-BRDIM[F]
Reduplicant correspondents of a base segment are featurally identical to that segment.

The idea behind this ranking among the BR-faithfulness constraints is that it is more important to satisfy the featural identity between corresponding elements than to satisfy segmental correspondence relation. Thus segments in the Base may not have segmental correspondents in the RED, but once there is a correspondent relation between two segments, the two segments must be identical in their feature value. This analysis is exemplified in the tableau (39).

(39)

/pés¢¬kwe –DIM/	V-PLACE	IDENT-BR[F]	MAX-BRDIM
☞ a. [p é]- p̱ -s ə ɬ kʷ e • • • VP VP	**		* (e)
b. [p é]- p̱ə̱- s ə ɬ kʷ e • • • • VP VP	**	*! (e=ə)	

The absence of schwa in the RED is forced to avoid violations of the featural identity of correspondents. Candidate (39b) violates IDENT-BR[F] since the feature of a Base vowel /e/ is not identical to its correspondent such as a schwa /ə/ in the RED. Whereas the actual output (39a) does not violate IDENT-BR[F] since the Base vowel /e/ does not have a correspondent in the RED and IDENT-BR is vacuously satisfied.

The ranking of the constraints for diminutive reduplication established so far is given in (40).

(40) ALIGN (DIM, L, V', R)>> V-PLACE >> IDENT-BR[F] >> MAX-BR

Notice that no templatic constraints are necessary to define the shape of diminutive reduplicants. I have shown that the correct shape of the diminutive RED can be derived from the interaction of the constraints without any templatic constraints.

Let us now turn to an analysis of schwa epenthesis as we discussed in (31) in §5.2.

5.4 Schwa Epenthesis in Diminutive Reduplication

The diminutive reduplicant usually consists of a single consonant. However, in some cases the diminutive RED is accompanied with an epenthetic schwa when the RED is followed by a sequence of a resonant and obstruent consonants. Let us look at the data in (41).

(41)	s-xé-xənx	'pebble, little stone'	s-xenx	'stone'
	clé-ləm-ken	'I bite'	clem	'to bite'
	lelú-ləmt-ken	'I suspect'	lelumt	'to suspect'
	ɣ n-smé-mənx	'my tobacco'	smenx	'tobacco
	ɣ n-ké-kəlx	'my hand'	kelx	'hand'

The ranking of constraints given in (40) fails to capture this schwa epenthesis. As shown in the tableau (42), candidate (42a), which is the actual output, cannot be selected as optimal since it violates IDENT-BR_{DIM}[F].

(42)

s-xénx-DIM	ALIGN (DIM, L, V', R)	V-PLACE	IDENT-BR[F]	$MAX\text{-}BR_{DIM}$
a. [s - x é]-x ə - nx • • | VP		*	*! (e=ə)	* (s)
☞💣 b. s –[x é]-x –n x • | VP		*		* (e)

In candidate (42a), a full vowel of the base is not identical in the feature value to its correspondent in the RED, thus IDENT-BR_{DIM}[F] is violated. Whereas candidate (42b) vacuously satisfies this constraint since the vowel /e/ in the base does not have its correspondent in the RED, therefore it is unexpectedly chosen as optimal.

In order to optimize the actual output (42a), I propose that syllabic well-formedness constraints given in (43a&b) are highly ranked in this language.

(43) a. HNUC: A syllable must have a vowel. (Prince and Smolensky 1993)

b. SONORITY: Onsets must increase and codas must decrease in sonority. (Clements 1990)

These syllabic well-formedness constraints optimize a correct output (42a) in the following way. Suppose that candidate (43b) *s-xexnx* forms a single syllable. A sequence of coda consonants *xnx* does not decrease in sonority and hence a constraint SONORITY is violated. Suppose that this sequence of consonants forms a syllable. A constraint HNUC forces a syllable to have a vowel, therefore an epenthetic schwa is inserted in the output (*s-xé-xə-nx*). This output satisfies SONORITY as well. This analysis is exemplified in the following tableau (44).

(44)

/s-xénx-DIM/	ALIGN (DIM, L, V', R)	HNUC	SONORITY	AFFIX ≤ σ	V-PLACE	IDENT -BR[F]	MAX -BR$_{DIM}$
☞ a. [s-xé.]-xənx. (σ σ; VP)					*	* (e=ə)	* (s)
b. s– [xé.]-x–nx. (σ σ; VP)		*!			*		* (e)
c. s–[xé]-x.–nx. (σ σ; VP)		*!			*		* (e)
d. s–[x é]-x–nx (σ; VP)			*!		*		* (e)

Highly ranked constraints HNUC and SONORITY rule out an output [s-xé-x-nx], no matter how it is syllabified. Candidate (44b) (s–xé.xnx.) is ruled out since the second syllable lacks a nucleus vowel and violates HNUC. Candidate (44c) (s–xéx.nx.) is also ruled out for the same reason. Candidate (44d), consisting of a single syllable, does not violate HNUC but violates SONORITY since the coda consonant clusters (/xnx/) dose not decrease in sonority. Obeying both HNUC and SONORITY, candidate (44a), which contains an epenthetic schwa in the RED is selected as optimal.

5.5 Summary

In this section, I have argued that prosodic templates cannot define the shape of the diminutive reduplicant. Without invoking any prosodic templates, I have shown that the shape, position and segmental content of the diminutive RED can be derived from interaction of the phonotactic well-formedness constraints and faithfulness constraints. The ranking of the constraints is summarized in (45) below:

(45) ALIGN (DIM, L, V', R), HNUC, SONORITY, AFFIX ≤ σ >> V-PLACE >> IDENT-BR[F] >> MAX-BR

6 Conclusion

In this paper, I have analyzed Shuswap distributive and diminutive reduplication in the framework of Optimality Theory. I have argued that reduplication-specific templates are not necessary and can be eliminated in the grammar: CVC-shape of the distributive reduplicant results from ranking of a constraint AFFIX ≤ σ above BR-faithfulness constraint MAX-BR, obviating perfect copy of reduplication. C-shape of the diminutive reduplicant results from ranking of a markedness constraint V-PLACE above a featural faithfulness constraint IDENT-BR[F], avoiding marked V-features in the RED. The ranking of V-PLACE above IDENT-BR[F] can also account for the fixed segmentism of the distributive RED, as motivated by the Emergence of the Unmarked. By eliminating templates for reduplicants, the present analysis minimizes reduplication specification and generalizes constraints in the grammar.

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