Wrong side reduplications in Salish and Temiar: Synergy of dissimilation and cluster simplification*

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Kim, Hyung-Soo. 2019. Wrong side reduplications in Salish and Temiar: Synergy of dissimilation and cluster simplification. *Studies in Phonetics, Phonology and Morphology* 25.3. 439-463. Consonant cluster reduction in partial reduplications of Salish and Temiar is analyzed under synergistic weakening by dissimilation and cluster simplification. These reduplications are peculiar because their reduplicants appear on the wrong side, with the final consonant of the root copied and put in front. It is argued that such peculiarities arise as a result of consonant cluster reduction that drops one of the identical consonants in a $C_1C_2C_1$ cluster. This analysis reveals that essentially the same cluster reduction rule is used in shaping the reduplicants in both Salish and Temiar. The difference between them arises by changing the direction of and the conditions on the rules of dissimilation and cluster simplification, the two universal processes that cooperate to bring about the reduction. **(Researcher, Hankuk University of Foreign Studies)**

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1. Introduction

Wrong side reduplications provide difficult yet interesting problems to work on because they violate the contiguity/locality principle in reduplication that reduplicants generally occur contiguous to the base (Marantz 1982, Riggle 2004, Nelson 2005). In this paper I consider two such cases: the augmentative reduplication in the Coast Salish languages of Tillamook and Twana and the continuative reduplication of triconsonantal roots in Temiar (Central Aslian, Austroasiatic). In the former, reduplication of the C_1VC_2X roots puts the reduplicant C_2- in front, as a

* Section 2 of this paper is based on two papers I have presented at the International Conference on Salish and Neighboring Languages (ICSNL) (Kim and Gardiner 2016, Kim 2017). I would like to thank the audience at my presentation and three anonymous reviewers of the journal for some valuable comments. All errors remain my responsibility.

prefix, i.e. $C_1VC_2X > C_2\text{-}C_1VC_2X$; while in the latter reduplication of $C_iC_mVC_f$ roots inserts a root-final consonant (C_f) between the root-initial (C_i) and the root-medial (C_m) consonants, i.e. $C_iC_mVC_f > C_i\text{-}C_f\text{-}C_mVC_f$. In this paper, it is argued that both of these peculiar reduplications arise as a result of a special consonant cluster reduction of $C_1C_2C_1$, in which dissimilation weakens one of the two identical consonants intervened by another consonant, and this weakened consonant then drops by cluster simplification.

In section 2, I present reduplication in Tillamook and Twana based on my earlier works (Kim and Gardiner 2016, Kim 2017), in which the variant reduplicants are reanalyzed as allomorphs of one and the same CVC reduplication. This affixational analysis is based on 'synergia', the concept that processes with similar phonological functions sometimes cooperate to work out a specific effect. Dissimilation and cluster simplification work together to achieve a special consonant cluster reduction such as $C_1C_2C_1 \rightarrow ØC_2C_1$, something they cannot do individually, because they share the same function of weakening a phonological element. This synergistic weakening with its theoretical background is presented in subsections 2.1 and 2.2. Based on this new rule and its theoretical underpinning, I then proceed in section 3 to seek an alternative analysis of Temiar continuative reduplication, in which a variation of the Salish cluster reduction rule provides an alternative to Broselow and McCarthy's (1984) infixational analysis. The paper closes with a brief summary of the analysis and its ramifications in section 4.

2. Augmentative reduplications in Tillamook and Twana

According to Edel (1939: 15), Tillamook augmentative reduplication copies either C1VC2- as in (1) or just C2- as in (2):

(1) Tillamook augmentatives with CVC reduplication[1]

Root	Reduplicated
yAl ‘to twist’	du wu-ts-**yil**yAl-A′qAn ‘he twists them’
gElEx ‘to speak’	ts-**gEl**gAlUx-A′n ‘they talked’

(2) Tillamook augmentatives with C_2- reduplication

Root	Reduplicated
dak’ ‘to lie’	nic-**k**dUk’ ns-adzAgil-agă′s
	‘they put her in their canoe’
gał ‘eye’	a ns-**ł**gał ‘my eyes’
nica ‘to be on the side’	**c**nica-wi′sti ‘I lie on my side’
łaq-il ‘to sit’	nc-**q**łA′q-il ‘he was sitting in it’

The reduplication in (2) is peculiar because C_2 of C_1VC_2X root is reduplicated and affixed in front. If this was a simple copying of C_2, we would expect it to be attached in the suffixal position rather than the prefixal position.

Interestingly, the same allomorphic variation of CVC reduplication also occurs in Twana augmentatives, though with more complications:[2]

(3) Twana augmentatives with C(V)C- reduplication

a. C_1VC_2X > $\mathbf{C_1əC_2}$-C_1VC_2X

Unaugmented	Augmented	Gloss

[1] Reduplicants are in boldface. Tillamook data are all from Edel (1939), who says that there are ‘cases where the same stem appears with different vowels, with no apparent change in context or meaning’, as in the first example of (1) where reduplication of the root Ti. *yAl* ‘to twist’ appears as Ti. *yilyAl*. She also mentions that the vowels ‘*E*, *A*, and *U* may be phonetically identical, their vocalic timber dependent upon accompanying consonants’. Since she gives three phonemic vowels *i*, *a and u* in addition to these allophonic vowels, while Egesdal and Thompson (1998) gives five phonemic vowels, *i*, *e*, *u*, *a* and *ə*, it is possible that the vowels described by Edel as *E*, *A*, and *U* are variants of phonemic *e* and *ə*. For example, in Thompson’s dictionary (Thompson n.d.: 47), the second example in (1), i.e. Ti. *gElEx* ‘to speak’ appears as √gʷələx.

[2] Twana data are all from Drachman (1969), reanalyzed as in Kim (2017). There are other complications that do not directly bear on the discussion here. For further details, consult Kim (2017).

bə́də(h)	**bəd**-bə́də(h)	'child'
łób	**łəb**-łób	'scar'
bále(h)	**bəl**-bále(h)	'roe, bait'
yəlʔə́x̣	**yəlˀ**-yə́lʔəx̣	'gather'
q̓ʷəláde(h)	**q̓ʷəlˀ**-q̓ʷə́lde(h)	'ear'
sélə(h)	**səlˀ**-sélə(h)	'grandfather'
wədáwʔ	**wədˀ**-wə́dawʔ	'horn'
yədes	**yədˀ**-yə́das	'tooth'

b. C_1VC_2X > $\mathbf{C_1C_2}$-C_1VC_2X

Unaugmented	Augmented	Gloss
s-tə́čəd	s-**tč**-tə́čəd	'slave'
s-pə́čo	s-**pč**-pə́čo	'berry-basket'
šóƛ̓	**šƛ̓**-šóƛ̓[3]	'grind'
š-čótax̣	š-**čt**-čótax̣	'halibut'

(4) Twana augmentatives with C_2(ə)- reduplication

a. C_1VC_2X > $\mathbf{C_2}$-C_1VC_2X

Unaugmented	Augmented	Gloss
sóq̓ʷay	**q̓ʷ**-sóq̓ʷay	'elder sister'
s-teqéw	s-**q**-téqaw	'horse'
s-tə́q	s-**q**-tə́q	'logjam'

b. C_1VC_2X > $\mathbf{C_2}$**ə**-C_1VC_2X

Unaugmented	Augmented	Gloss
ʔas-báx̣	ʔəs-**x̣ə**-báx̣	'worn out'
bəqsə́d	**qə**-bə́qsəd	'nose'
wəq̓ə́b	**q̓ə**-wə́q̓ab	'box'

The complications involve deletion and insertion of schwa in the reduplicant. In (3a), the root vowel appears as a schwa in the reduplicant with CVC allomorph (Tw. ***łəb***-*łób*); in (3b), the same schwa is elided between two voiceless consonants (Tw. ***šƛ̓***-*šóƛ̓*). These thus correspond to Tillamook examples in (1) which generally retain the

[3] The symbol ƛ refers to a voiceless lateral affricate (IPA [tɬ]). The apostrophe that appears on phonetic symbols, e.g. ƛ̓, indicates glottalization, which is distinguished from a simple glottal stop [ʔ].

root vowel: the difference in Twana is that the root vowel weakens to a schwa in the reduplicant (3a), which is then devoiced between two voiceless consonants and drops out (3b).

Examples in (4), on the other hand, are like the Tillamook examples in (2) in that only C_2 of a C_1VC_2X root remains in the reduplicant. The difference is that Twana develops a schwa between C_2 of the reduplicant and C_1 of the root (4b), although the same anaptyxis does not occur when the two consonants are both voiceless (4a); or more precisely, the same anaptyxis also occurs in the examples of (4a), but the inserted schwa drops out between two voiceless consonants, just as in the examples of (3b).

The peculiarities in augmentative reduplication in Tillamook and Twana have also been noticed by previous scholarship, with some suggestions for their explanation. For example, regarding the truncated reduplication in (2), McCarthy and Prince (1996: 74, cf. Nelson 2005: 141) say that 'the Northwest Coast language Tillamook … is so poorly described that a number of plausible alternatives (like cluster simplification) simply cannot be tested'. Thompson and Thompson (1985: 141-142), on the other hand, suggest that the Tillamook examples such as (2) 'must have developed as a kind of dissimilation under specific conditions' even though 'Edel (1939: 15) considers it a separate type of reduplication'[4] and 'circumstances under which it happens are at present obscure'. Importantly, they also note the affinity between Tillamook and Twana in truncated reduplications such as (2) and (4):

> "The details of a similar formation [of the truncated augmentative] in Twana have been worked out by Drachman (1969: 53ff), and it seems likely that similar constraints govern the cases in Tillamook. It is conceivable that the truncation rules in these two languages are historically related, but this can be determined only after the historical development of both is more fully understood." (Thompson and Thompson 1985: 145, fn. 7)

Once we realize that C_1VC_2- in (1) and (3) and C_2- in (2) and (4) are allomorphs of one and the same CVC reduplication, the suggestions made by previous scholarship take on a new significance to help us draw up an alternative analysis. As an

[4] Note also that Egesdal and Thompson (1998) include the reduplications in (1) and (2) under the same augmentative type, implying that they are of the same origin.

allomorph of the same CVC reduplication, the reduplicant in (2) and (4) must have begun its life as C_1VC_2- as in (1) and (3), but lost its vowel to form a triconsonantal cluster C_1C_2-C_1, which has subsequently reduced to a biconsonantal cluster C_2-C_1 by a special type of consonant cluster reduction, as in (5):

(5) Consonant cluster reduction of $C_1C_2C_1 \rightarrow ØC_2C_1$

a. Tillamook:

<u>Rule</u>	<u>Example</u>
dkd > kd	*nic-**dkd**Uk’ > nic-**kd**Uk’
gɬg > ɬg	*a ns-**gɬg**at > a ns-**ɬg**at
ncn > cn	***ncn**ica-wi’sti > **cn**ica-wi’sti
ɬqɬ > qɬ	*nc-**ɬqɬ**A’q-il > nc-**qɬ**A’q-il

b. Twana:

<u>Rule</u>	<u>Example</u>
sq̓ʷs > q̓ʷs	***sq̓ʷ**-sóq̓ʷay > **q̓ʷ**-sóq̓ʷay
tqt > qt	*s-**tq**-téqaw > s-**q**-téqaw
tqt > qt	*s-**tq**-tə́q > s-**q**-tə́q

Note that in Twana this cluster reduction is obscured by two subsequent rules, both of which concern the reduced vowel schwa: a schwa is inserted by anaptyxis between C_2 of the reduplicant and C_1 of the root, as in (4b) but this inserted schwa is deleted between two voiceless consonants, as in (4a).

(6) Reduction of $C_1C_2C_1$ in Twana reduplication

soq̓ʷ-sóq̓ʷay	ʔas-bax̣-báx̣	
sq̓ʷ-sóq̓ʷay	ʔas-bx̣-báx̣	unstressed reduplicant vowel lost
q̓ʷ-sóq̓ʷay	ʔas-x̣-báx̣	$C_1C_2C_1 \rightarrow ØC_2C_1$
q̓ʷə-sóq̓ʷay	ʔas-x̣ə-báx̣	anaptyxis: $\#C_2C_1 \rightarrow \#C_2əC_1$
q̓ʷ-sóq̓ʷay	———————	schwa deletion (C̥_C̥)
———————	ʔəs-x̣ə-báx̣	miscellaneous rules

The same schwa deletion rule also occurs in (3b) where the reduplicant vowel must have reduced to a schwa as in (3a) but dropped out between two voiceless consonants. This is why the surface $C_1C_2C_1$ clusters in (3b) do not undergo the same cluster reduction:

(7) Retention of $C_1C_2C_1$ in Twana reduplication

łob-łób	šoƛ̓-šóƛ̓	
łəb-łób	šəƛ̓-šóƛ̓	unstressed reduplicant vowel weakened
―――――	―――――	$C_1C_2C_1 \rightarrow ØC_2C_1$
―――――	―――――	anaptyxis: $\#C_2C_1 \rightarrow \#C_2əC_1$
―――――	šƛ̓-šóƛ̓	schwa deletion (Ç̥_Ç̥)

Two questions still remain to be answered at this point: 1) What distinguishes roots that maintain their vowel in the reduplicant, as in (1) and (3), from those that drop it, as in (2) and (4)? 2) How does the reduction of $C_1C_2C_1 \rightarrow ØC_2C_1$ occur even though three consonant groups generally remain unreduced in Tillamook and Twana, e.g. Ti. *ts-qep-st-és* 'he habitually bandages it' and Tw. *ʔəs-pq̓ʷéqʷad* 'feather in hair'?[5] We take up these questions in two subsections below.

2.1 The strong vs. weak roots in Coast Salish languages

Why does the root vowel drop in the reduplicants of the Twana augmentatives in (4), but remain as a schwa in those of (3), even though the reduplicant is unstressed in both? This question is important because, as one can see by comparing the derivations of (6) and (7), the cluster reduction rule $C_1C_2C_1 \rightarrow ØC_2C_1$ crucially depends on prior loss or retention of the reduplicant vowel.

According to van Eijk (1998: 459), CVC reduplications in Salish generally assign the stress in two patterns: (a) the stress falls on the CVC prefix; (b) the stress remains on a later syllable, i.e., on the root or on a suffix. Some roots choose the first pattern, others the second. While roots choosing the second pattern (weak roots, abbr. WR) uniformly have the stress on the base, roots choosing the first pattern (strong roots, abbr. SR) vary their stress position across languages: In some languages the stress falls on the CVC reduplicant (*Type 1*) but in others on the base itself (*Type 2*). There are also languages that vary between the two patterns (*Type 3*).

[5] The following language abbreviations are used: Gk. = Greek, Kor. = Korean, Lt. =Latin, Skt. = Sanskrit, Sm. = Semai, Ti. = Tillamook, Tm. = Temiar and Tw. = Twana.

Table 1. Types of stress patterns in Salish CVC reduplication (Kim 2017, cf. van Eijk 1998: 460)

root type / reduplication type	CV́C (..)[SR]	C(V)CV́ [WR]
Type 1	CV́C-CVC(..)	
Type 2	CVC-CV́C(..)	CVC-C(V)CV́ (CVC-CV́CV-Tw)
Type 3	CV́C-CVC(..) ~ CVC-CV́C(..)	

Van Eijk lists Lushootseed, Upper Chehalis, and Coeur d'Alene under *Type 1*, Twana as the only language under *Type 2*, and Shuswap and a host of other Interior and Coast Salish languages under *Type 3*; while making no mention of what type Tillamook belongs to.

From the above table, we can hypothesize that *Type 1* was perhaps the original stress pattern for CVC reduplication in all Salish languages, and *Type 2* developed from this original pattern by moving the stress to the base in strong roots. *Type 3* is in between these two, with the main stress still on the reduplicant in some words (as in *Type 1*) but on the base in others (as in *Type 2*). Since the cluster reduction of $C_1C_2C_1 \rightarrow ØC_2C_1$ does not occur in strong root reduplication in Twana, we may deduce that this stress movement occurred quite late, after the loss of the reduplicant vowel and reduction of the triconsonantal cluster. Consider the following canonical derivation:

(8) Canonical derivation-I

$C_1\acute{V}C_2$-C_1VC_2X [SR]	C_1VC_2-$C_1\acute{V}C_2X$ [WR]	
————————	C_1C_2-$C_1\acute{V}C_2X$	reduplicant vowel loss
————————	C_2-$C_1\acute{V}C_2X$	$C_1C_2C_1 \rightarrow ØC_2C_1$
C_1VC_2- $C_1\acute{V}C_2X$	————————	stress movement
C_1əC_2-$C_1\acute{V}C_2X$	————————	unstressed V-weakening
————————	C_2ə-$C_1\acute{V}C_2X$	anaptyxis: #CC → CəC
C_1C_2-$C_1\acute{V}C_2X$	————————	schwa deletion (C̥_C̥)
(šƛ̓-šóƛ̓ < *šóƛ̓-šoƛ̓)	(q̓ə-wə́q̓ab < *wəq̓-wə́q̓ab)	

This explanation, however, has a drawback: the stress movement, which occurs as part of reduplicative stem formation, applies after the phonological rules such as reduplicant vowel loss and cluster reduction of $C_1C_2C_1 \rightarrow \text{Ø}C_2C_1$. Such ordering goes against the general principle that morphology precedes phonology in derivation. As an alternative, we can hypothesize that the schwa is maintained in the reduplicants of strong roots because, when the stress moves to the base in *type 2* languages, the primary stress that once was on the reduplicant vowel leaves a trace in the form of a secondary stress, so that the reduplicant vowel in strong roots does not drop but only weakens to a schwa:

(9) Canonical derivation-II

$C_1\acute{V}C_2\text{-}C_1VC_2X$ [SR]	$C_1VC_2\text{-}C_1\acute{V}C_2X$ [WR]	
$C_1\grave{V}C_2\text{-}C_1\acute{V}C_2X$	————————	stress movement
$C_1\text{ə}C_2\text{-}C_1\acute{V}C_2X$	$C_1C_2\text{-}C_1\acute{V}C_2X$	reduplicant V-weakening
——————————	$C_2\text{-}C_1\acute{V}C_2X$	$C_1C_2C_1 \rightarrow \text{Ø}C_2C_1$
——————————	$C_2\text{ə-}C_1\acute{V}C_2X$	anaptyxis: #CC→CəC
——————————	$C_1C_2\text{-}C_1\acute{V}C_2X$	schwa deletion (C̥_C̥)
(šƛ̓-šóƛ̓ < *šóƛ̓-šoƛ̓)	(q̓ə-wə́q̓ab < *wəq̓-wə́q̓ab)	

We adopt this analysis, despite the fact that it hangs on the hypothesis of secondary stress, because morphology does precede phonology in its derivational order. For Tillamook, though more work is necessary to find out what type it belongs to, we can make the same conjecture: unlike the reduplicant vowel in the strong root, the reduplicant vowel in the weak root drops because it is unstressed, and it is this elision of the reduplicant vowel that feeds the consonant cluster reduction of $C_1C_2C_1 \rightarrow \text{Ø}C_2C_1$ in the examples of (2).

2.2 Synergy of dissimilation and cluster simplification

Having explained why the same cluster reduction of $C_1C_2C_1 \rightarrow \text{Ø}C_2C_1$ occurs in CVC reduplications of certain roots but not of others, we now consider the second question we raised: How does the triconsonantal reduction of $C_1C_2C_1$ occur even though three consonant groups generally remain unreduced in Tillamook and Twana, e.g. Ti. *ts-qep-st-és* 'he habitually bandages it' and Tw. *ʔəs-pq̓ʷéqʷad* 'feather in hair'?

As we recall, the suggestions made by previous scholarship is that this cluster reduction may be due to cluster simplification (McCarthy and Prince 1996) or dissimilation under specific conditions (Thompson and Thompson 1985). These suggestions are feasible because the reduction itself occurs in a triconsonantal cluster and only between two identical consonants across another consonant.

The problem is that cluster simplification alone cannot reduce the cluster because as mentioned above three consonant groups generally remain in Tillamook and Twana. Nor can the reduction occur by simple dissimilation between two identical consonants because dissimilation, especially the type by which a phonological element elides, typically occurs between two complex segments: between two aspirated consonants as in Grassmann's Law in Greek and Sanskrit, e.g. Gk. *ti-t*^{h}*emi* <**t*^{h}*i-t*^{h}*emi* 'I do' Skt. *da-d*^{h}*ami* <**d*^{h}*a-d*^{h}*ami* 'id.', or between two glottalized consonants, e.g. Ti. *sq-súqꞌl* < **sqꞌ-súqꞌl* 'younger sisters' (Thompson and Thompson 1985: 141).

Note, however, that there is a third possibility: If dissimilation and cluster simplification cannot do the job of reducing $C_1C_2C_1$ to C_2C_1 individually, could these two processes work together to achieve what they could not do separately? The logic for this thinking is simple: since the elision occurs only when the consonant is in a cluster, cluster simplification must be in part responsible for the deletion; similarly, since the same elision occurs only when two identical (or similar, as will be explained below) consonants occur across another consonant, dissimilation should be partly responsible for the deletion as well. It thus seems quite plausible that dissimilation and cluster simplification have worked synergistically to bring about the deletion.

But by what mechanism does the synergy of dissimilation and cluster simplification occur? It is easy to say that the two processes work together, but how does this cooperation occur and why?

Although it has received little attention in the literature, a consonant cluster reduction of the type that occurs in Tillamook and Twana is quite common in languages. Consider:

(10) Triconsonantal reduction by synergy of dissimilation and cluster simplification

Greek:
laskō <* lak-sk-ō 'I speak' (cf. aor. elakon)
blasphemos <*blaps-phamos 'blasphemous' (cf. blabos 'hurtful')
didaskō <*di-dak-sk-ō 'I teach' (cf. perf. didakhe)

Latin:
āvertō <*abs-vertō 'I turn away' (cf. vertō 'turn')
āmittō <*abs-mittō 'I send away' (cf. mittō 'send')
asportō <*abs-portō 'I carry off' (cf. portō 'carry')

In the Greek examples, the rule is the same as the one that occurs in Tillamook and Twana: $C_1C_2C_1 \rightarrow ØC_2C_1$. In Latin, on the other hand, the rule is more general in that the consonant cluster reduces even though the two consonants are not identical but only similar (they both are labial). Since three consonant groups also remain in Greek, as witnessed by, e.g. Gk. *arktos* 'bear' where *rkt* does not reduce, we cannot simply say that the reduction occurs by cluster simplification alone. Similarly, since the Latin prefix *abs-* 'away' remains unreduced in examples such as Lt. *abscedō* 'I go away' (cf. Lt. *cedō* 'come'), we cannot simply say that the clusters *bsv*, *bsm*, and *bsp* lose their first consonant by cluster simplification.[6] This indicates that a rule that occurs under a condition of similarity between two consonants, such as dissimilation, should be also at work. In other words, the two processes of dissimilation and cluster simplification must have worked together to elide the consonant.

Dissimilation and cluster simplification work together because they share the same function of eliding a phonological element. For example, Grassmann's Law, as mentioned earlier, deaspirates an aspirate when it is followed by another aspirate, e.g. Gk. *tit^{h}emi* < **t^{h}i-t^{h}emi* 'I do'. As a rule it is thus an elision of /^{h}/ in an aspirate: $C^hVC^h \rightarrow CVC^h$.[7] Similarly, cluster simplification drops a consonant in a group of consonants. Conceptually then, these are weakening processes as their function is to elide a phonological element. For the special consonant cluster reduction occurring in

[6] Note that /s/ also drops before voiced consonants in Lt. *āvertō* <**abs-vertō* and *āmittō* <**abs-mittō* by a process unrelated to cluster reduction: it undergoes voicing assimilation with the following voiced consonant and the ensuing /z/ drops, compensatorily lengthening the preceding vowel, as in Lt. *nīdus* <**ni-sd-os* 'nest'. Cf. Buck (1933: 149).

[7] A reviewer raised the question of whether the aspiration described as /^{h}/ here represents a feature or a phoneme. My point in this paper is that the canonical form of Grassmann's Law type of dissimilation occurs between two complex segments, usually composed of two tightly bound phonological elements, one of which is primary articulation and the other, secondary. In aspirated consonants, the aspiration serves as the secondary articulation, which is what dissimilation typically weakens (and elides). For more examples of dissimilation between complex segments, cf. Kim (1991).

Tillamook, Twana, Greek and Latin, we could say then that dissimilation first weakens the first of two sufficiently similar consonants, and the weakened consonant drops by cluster simplification.

The idea that dissimilation weakens a consonant when another consonant of close similarity follows is from Foley (1981: 85), who gives the mechanism of dissimilation as a strength fluxion between two similar elements, as in (11):

(11) $C\ \S\ K \rightarrow C^{-}\ \S\ K^{+}$ where $|C\text{-}K| \leq \delta$ and $|C - \S| \geq \Delta$

What this says is that consonantal dissimilation typically weakens the first of two consonants (or consonant clusters) and the second consonant strengthens in response to this weakening. It also says that dissimilation occurs under two conditions: 1) when the two consonants are sufficiently similar ($|C\text{-}K| \leq \delta$); 2) when what comes between the two consonants (§) is sufficiently different from them ($|C - \S| \geq \Delta$).[8]

By this mechanism the first of two identical consonants in clusters of $C_1C_2C_1$ in Tillamook, Twana and Greek weakens, and this pre-weakened consonant then drops by cluster simplification, because weakened consonants are prone to further weakening (i.e. elision).[9] In Tillamook and Twana, the environment for this dissimilation is facilitated by CVC reduplication which creates identical consonants, while the environment for cluster simplification is provided by elision of the reduplicant vowel in weak roots. Consider the following comparative derivation of strong vs. weak roots reduplicated in Tillamook:

[8] Further details on the mechanism of dissimilation and its application across languages are too complex to be included in this paper. Interested readers should consult Kim (1991).

[9] This is predicted by the Inertial Development Principle, according to which weak elements weaken first and preferentially in a weakening process. See Foley (1977) for further details of a phonological theory based on the concepts of weakening and strengthening.

(12) Reduction of $C_1C_2C_1$ to $ØC_2C_1$ in Tillamook augmentatives

gEl-Ex[SR]	łaq-ilj [WR]	
gEl-gEl-Ex	łaq-łaq-il	reduplication
———————	łq-łaq-il	loss of unstressed vowel in the reduplicant
———————	ł$^{-}$qł$^{+}$aq-il	dissimilation of identical consonants
———————	qł$^{+}$aq-il	cluster simplification
gEl-gAl-Ex	qłA′q-il	miscellaneous rules

In Latin, on the other hand, the first condition on dissimilation, that the two consonants be sufficiently similar ($|C\text{-}K| \leq \delta$), is relaxed so that the same dissimilation may occur as long as the two consonants are both labial.[10] The variation of cluster reduction between Tillamook, Twana and Greek on the one hand and Latin on the other can thus be captured in a rule form such as (13):

(13) $C_1C_2C_3 \rightarrow ØC_2C_3$ where $|C_1 - C_3| \leq \delta$

$\delta = 0$ for consonant cluster reduction in Tillamook, Twana and Greek

$\delta = 1$ for Latin cluster reduction in derivatives with the prefix *abs-*

It is remarkable that the variation on consonant cluster reduction across languages is captured on a condition of dissimilation that it occurs between sufficiently similar consonants ($|C_1 - C_3| \leq \delta$). Even more remarkable is what happens in Temiar continuative reduplication, in which the same cluster reduction occurs under a more restricted condition that the triconsontal cluster $C_1C_2C_1$ be in a group of four or more consonants, while the C_1 that drops by this consonantal cluster reduction is always in the middle of a cluster, due to the bidirectional weakening by dissimilation.

3. The continuative reduplication in Temiar

The following is the verb paradigm of bi- vs. tri-consonantal roots in Temiar, our main data for consideration in this section:

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[10] The second condition does not concern us directly here. To see how it works, confer Kim (1991).

(14) Temiar verb paradigm (cf. Broselow and McCarthy 1984: 39, Benjamin 1976: 169)

Root type:		Biconsonantal	Triconsonantal
Active voice:			
	Perfective	kɔ̄w	slɔg
	Simulfactive	kakɔ̄w	salɔg
	Continuative	kwkɔ̄w	sglɔg
Causative voice:			
	Perfective	trkɔ̄w	srslɔg
	Simulfactive	[trakɔ̄w]	[sralɔg][11]
	Continuative	trwkɔ̄w	srglɔg

Broselow and McCarthy (1984: 39), while discussing infixal reduplication in Levantine Arabic and Temiar continuatives, say that 'in Temiar virtually the opposite [of what obtains in Levantine Arabic] happens to the triconsonantal verb: a copy of the root-final consonant is lodged to the immediate left of the root medial consonant. Thus, *slɔg* becomes *sglɔg*'. Formally their derivation proceeds in the following order: 1) infix C in the context [C_CVC] on the skeletal tier, 2) copy the phonemic melody of the root and 3) autosegmentally associate the final consonant of the copied root from right to left. For reduplication of the biconsonatal verb Tm. *kw-kɔ̄w* (cf. Tm. *kɔ̄w* 'call'), the derivation is the same as in the triconsonantal verb except that the initial consonant of the root is copied by leftward spreading: *kɔ̄w* > **kkɔ̄w* (by spreading) > **k-w-kɔ̄w* (by the same three rules that occur in the triconsonantal verb above). The rule spreading the root-initial consonant is based on the biconsonantal simulfactive, e.g. Tm. *kakɔ̄w*, which they analyze as arising by the same spreading of the root-initial consonant and *–a-* infixation: *kɔ̄w* > **kkɔ̄w* > *k-a-kɔ̄w*.

This reduplication is problematic, however, because it is on the wrong side in that a final consonant (C_f) of the base is copied and put between the initial (C_i) and the middle (C_m) consonants. It is unlike the reduplication in the corresponding biconsonantal verb Tm. *kɔ̄w* 'call', which copies both initial and final consonants of the root: Tm. *kw-kɔ̄w*.

Alternatively, we could assume that the initial and final consonants of the root are copied in both bi- and tri-consonantal continuative roots and see if we can find why the reduction occurs only in the reduplication of the triconsonantal verb, i.e. Tm. **sg-*

[11] Broselow and McCarthy (1984: 39) say these forms in brackets are unattested but added here based on the rule according to Benjamin (1976).

slɔg > *sglɔg*. This is precisely what is proposed by Blust (2006: 441), who assumes that 1) the biconsonantal simulfactive verb Tm. *ka-kɔ̄w* is formed by *Ca-* reduplication rather than *-a-* infixation, and 2) the reduplicative affix in the continuative verb form Tm. *sg-lɔg* is a prefix *sg-* formed by copying the first and last consonants of the base, not an infix *-g-*.[12] But this assumption runs into difficulty in explaining the triconsonantal simulfactive Tm. *salɔg*:

> "Although this alternative is supported by evidence of historical restructuring, it is difficult to motivate medial cluster reduction synchronically. The proposed cluster reduction in **sg.s.lɔg* > ***sg***.*lɔg* might follow from the observation that clusters of four consonants are disallowed in Temiar, but the cluster reduction in **sa.s.lɔg* > ***sa***.*lɔg* evidently would have to be analogical" (Blust 2004: 441. Baldface original-HSK).

What should be noted with regard to the simulfactive forms in (14) is that reduplication of a root-initial consonant (C_i) occurs only in the active voice of bi-consonantal simulfactive. No initial consonant is reduplicated in the causative voice of bi-consonantal simulfactive; nor is it in tri-consonantal simulfactives in general. This suggests that what is occurring is not really *Ca-* reduplication but *–a-* infixation, with C_i reduplicated only in the bi-consonantal simulfactive active form to provide the interconsonantal position needed for the infix *–a-*. Under this view, the problem of how the second /s/ drops by consonant cluster reduction in **sa-slɔg* > *sa-slɔg* does not arise, for the root *slɔg* by itself has the natural site for placing infixal *–a-*: *slɔg* > *s-a-lɔg*. Note that it is for the same reason that the simulfactive causative voice of bi-consonantal root *kɔ̄w* is formed without reduplication of C_i: the causative marker *tr-* prefixed to the root provides the natural site for the infix *–a-*: *tr-a-kɔ̄w*.

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[12] These proposals are made by Blust as an alternative to Gafos' (1998) view that Temiar reduplication is a case of 'a-templatic' reduplication. I have refrained from commenting on this important Optimality-Theoretic analysis because it is based on an approach entirely different from the approach of this paper: The former is constraint-based and acquisition-oriented, but the latter is rule-based (derivational) and typological. Although both approaches pursue universality of language, they differ in details: the former seeks learnable universal grammar, but the latter absolute universals. The general issues that arise in analyzing Temiar reduplication under these two different approaches are thus too complex to be presented in this paper, but a separate paper is in preparation.

This explanation, however, has a problem of its own in that there seems to be no Austronesian language other than closely related Semai that shows such infixation. Presumably, this is why Blust proposes *Ca-* reduplication as an option to consider because unlike *–a-* infixation, there are plenty of Austronesian languages in which *Ca-* reduplication occurs (Blust 1998). Perhaps it is the case that the *–a-* infixation has developed from *Ca*-reduplication. It is possible, for example, that *Ca*-reduplication in these forms is attached as a prefix not to the prosodic word as Blust assumes, but to the final stressed syllable. Under this revised hypothesis, Tm. *salɔg* would not be derived from **sa-slɔg*, but from **s-sa-lɔg*, by degemination of the initial geminate. Note that as a 'sesqui-syllablic' root, the initial /s/ of *slɔg* constitutes a minor (half) syllable, leaving the remaining /lɔg/ as the final stressed syllable (Benjamin 2018: 4). But this analysis would also run into the problem of how to explain the simulfactive causative voice forms, the hypothetical [trakɔ̄w] and [sralɔg], which would be from **tr-ka-kɔ̄w* and **s-r-salɔg*. This is because as the continuative active form Tm. *kwkɔ̄w* testifies, clusters of three consonants remain unreduced in Temiar, even if that cluster is of the type $C_1C_2C_1$. I leave this difficult problem of simulfactive formation in Temiar for future research.

As for the continuatives, Broselow and McCarthy's analysis would be hard-pressed to explain why the infixal reduplication of final consonant occurs with tri-consonantal roots, e.g. Tm. *slɔg* > *s-g-lɔg*, but not with the bi-consonantal roots, which reduplicate the initial and the final consonants, e.g. Tm. *kwkɔ̄w*. In addition, they cannot avoid the criticism that wrong side reduplication is acknowledged as a viable method of reduplicative affixation.

On the other hand, Blust's suggestion that consonant clusters with four or more members reduce has none of these problems. He assumes that the initial and final consonants are reduplicated in continuative forms of both bi- and tri-consonantal roots, so no problem of wrong side reduplicative affixation arises; the reduplication of initial (C_i) and final (C_f) consonants occurs in both bi- and tri-consonantal roots so that there is no further need to specify that reduplication is prefixal with bi-consonantal roots but infixal with tri-consonantal roots. Still, there remain a couple of questions to answer before such a suggestion becomes a persuasive explanation. To see what these questions are, let us begin by looking at the underlying representations with C_i and C_f copied in all four continuative forms:

(15) Underlying representations of continuative forms

Root type:	bi-consonantal	tri-consonantal
Active cont.:	kwkɔ̄w < *kw-kɔ̄w	sglɔg < *sg-slɔg
Causative cont.:	trwkɔ̄w < *tr-kw-kɔ̄w	srglɔg < *s-r-g-slɔg

Noticeable in these underlying forms with regard to consonant cluster reduction is that, as stipulated by Blust, a consonant cluster of the type $C_1C_2C_1$ remains in a triconsonantal cluster (_kwkɔ̄w_) but reduces in a cluster of four or more consonants (_sglɔg_ < _*sg-slɔg_, _trwkɔ̄w_ < _*tr-kw-kɔ̄w_, and _srglɔg_ < _*s-r-g-slɔg_). This preferential reduction is due to the principle in cluster simplification that the longer a consonant cluster is, the more likely it is to reduce: $C^n \rightarrow C^{n-1}$ where $|n| \geq \Delta$. This condition on cluster simplification varies between Salish and Temiar: a $C_1C_2C_1$ cluster reduces in a cluster of three or more consonants in the Salish languages of Tillamook and Twana but it does so only in a cluster of four or more consonants in Temiar. That is, for the condition $|n| \geq \Delta$, $\Delta = 3$ for Tillamook and Twana but $\Delta = 4$ for Temiar.

A more difficult question is which of the two identical consonants drops by synergy of dissimilation and cluster simplification. For example, of two identical consonants, why does the rule drop the first consonant in _trwkɔ̄w_ <_*tr-kw-kɔ̄w_ but the second one in _sglɔg_ <_*sg-slɔg_ and _srglɔg_ <_*s-r-g-slɔg_? The answer to this question is found in the nature of the two processes themselves. First, note that dissimilation, like assimilation, sometimes changes its direction. Usually, the direction is left-to-right, with the first of two identical consonants weakened. But this direction is sometimes reversed if a favorable ambiance is provided for such reversal.

Consider the following desiderative forms in Sanskrit, for example (for details on the data and the analysis, cf. Kim 1991):

(16) Sanskrit desideratives: C_1i-$C_1C_2C_3 \rightarrow C_1$i-Ø$C_2C_3$

Root	Desiderative
sah ‘prevail’	siksati < *si-sg^h-sa-ti
sak ‘be able’	siksati < *si-sk-sa-ti
lab^h ‘take’	lipsati < *li-lb^h-sa-ti
dah ‘burn’	d^{h}iksati < *d^{h}i-d^{h}g^h-sa-ti
dab^h ‘burn’	d$^{(h)}$ipsati < *d^{h}i-d^{h}b^h-sa-ti
rab^h ‘grasp’	ripsati < *ri-rb^h-sa-ti
pad ‘go’	pitsati < *pi-pt-sati

Here, the usual direction of dissimilation is reversed as the second C_1 occurs in a triconsonantal cluster, an environment in which a weak consonant can be weakened further. The dissimilation mechanism thus weakens the second, rather than the first, of two identical consonants, which then drops by cluster simplification:

(17) Skt. *kalpsyati* < **kalp-sya-ti* ‘He will shape’; Skt. *lipsati* < **li-lb^h-sa-ti* ‘He desires to take’:

kalp-sya-ti	li-lb^h-sa-ti	
———	l$^+$il$^-$b^{h}sati	dissimilation
———	lib^{h}sati	cluster simplification
———	libsati	deaspiration (__s)
———	lipsati	assimilation

What is remarkable in the Temiar case is that of the two identical consonants, it is always the one in the middle of a cluster that drops by the cluster reduction rule. Thus it is the first of two identical consonants that drops in a four consonant group in Tm. *trwkɔ̄w* <**tr-kw-kɔ̄w* but the second one in Tm. *sglɔg* < **sg-slɔg* and Tm. *srglɔg* < **s-r-g-slɔg*. This is because, as in the Sanskrit desiderative case, a reversal in the direction of dissimilation has occurred: of the two identical consonants, dissimilation weakens the one in the middle of a four consonant group, which is then deleted by cluster simplification:.

(18) tr-kw-kɔ̄w sg-slɔg
tr-k^-w-k^+ɔ̄w s^+g-s^-lɔg dissimilation
trwk^+ɔ̄w s^+g-s^-lɔg cluster simplification

A couple of questions still remain: 1) How plausible is a reduplication rule that copies both the initial (C_i) and the final (C_f) consonant of the root? Recall that this rule creates the triconsonantal cluster $C_iC_fC_i$ that subsequently reduces in Temiar, to either C_fC_i or C_iC_f, depending on which C_i is in the middle of a cluster. 2) Even if we concede that such practice of copying is a viable method of reduplication, the question that arises is then: where in the grammar does it belong?

To answer these questions, we note two things. First, the reduplication rule that copies the initial and final consonants of the root is in fact quite common in Austroasiatic languages to which Temiar belongs. For example, in Temiar and Semai, the same prefixal reduplication of C_iC_f- occurs in expressives meaning ‘prolongation or continuative repetition in time’, e.g. Tm. ***rg***-*rwēg* ‘to stand conspicuously upright’ and Sm. ***dh***-*dŋɔh* ‘appearance of nodding constantly’ (Miyakoshi 2006: 45-46, Diffloth 1976: 252). The clusters of $C_1C_2C_1$ do not reduce in these forms because, as is well-known, expressive words often behave differently from their nonexpressive counterparts; they may not follow phonological rules that are normally observed in nonexpressives, for, if the same reduction of $C_1C_2C_1$ clusters had occurred to them, they would have lost their expressivity.[13].

For the second question of where in the grammar the C_iC_f- reduplication occurs, we may begin with the postulation that partial reduplications are reductions from full reduplications (Steriade 1988, Bybee et al. 1994: 166). This statement cannot apply to all partial reduplications, for, as we know from the historical study of language development, ways of making new forms often spring from old ways and become conventionalized. Still, we can postulate that, like other partial reduplications, the C_iC_f- reduplication began as a full reduplication but the first member of the reduplicative compound was truncated to a prefix composed of the initial and final

[13] Note, for another example, that the vowel harmony rule that used to occur robustly in Middle Korean is no longer strictly observed in modern Korean, except in sound symbolic words (Kim 2002). This is because these harmony rules persist in the sound symbolic words in modern Korean for their ‘expressive function’, with separate groups of yin/yang vowels encoding the different degree of symbolic values in heaviness, intensity, or size.

consonants only, as in the expressives of Temiar and Semai.[14] It is certain that these two consonants, the initial and the final, have been chosen for their symbolic value of representing the whole by what begins and what ends. The continuatives in the paradigm (14) could have originated the same way, beginning with full-to-partial reduction to C_iC_f-reduplication, and subsequent application of cluster reduction as they became 'grammaticalized'.

One thing is clear from the foregoing discussion: the full-to-partial reduction of this reduplicative compound cannot have occurred in the phonology, for the obvious reason that no phonological rule deletes all the vowels and consonants between C_i and C_f. The option that remains is then that it occurs in the morphology, as a case of 'morphological reduction'. This idea of morphological reduction is not new. For example, McCarthy and Prince (1996: 74) explain the obvious wrong side reduplication in Madurese, e.g. ***dus**-garadus* 'fast and sloppy' by 'total stem reduplication … and a subsequent rule reducing the left branch of a compound to its stressed (that is, final) syllable…'.

Similarly, for the Korean partial reduplication of the type Kor. *tek-tekul* 'rolling', it has been standardly assumed that it is a partial prefixal reduplication. But such a view would go against Greenberg's implicational universals (1966), according to which agglutinative languages with SOV word order are expected to have suffixation rather than prefixation. It is thus difficult to admit prefixal reduplication in a language like Korean, which predominantly admits only suffixes. But like the Madurese case, Kor. *tek-tekul* 'rolling' is a morphologically reduced form of the fully reduplicated *tekul-tekul* 'id.' Since this reduction occurs in the domain of morphology, a phonological rule may follow it, as in Kor. *tu-tuŋsil* 'floating' < **tuŋ-tuŋsil* where *ŋCVŋC → CVŋC* by dissimilation of consonant clusters (Kim 2003, Kim 2009). It is the same in the Temiar continuative reduplication in which we have first C_iC_f- reduplication, a morphologically reduced and conventionalized form of full reduplication, which then undergoes the phonological rule of $C_iC_fC_i$ cluster reduction when the cluster occurs in a four consonant group.

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[14] For such conventionalization, note the following quote from Bresnan and Aissen (2002: 3): "… there is no longer a mystery about how the 'conventionalization' of preferences into formal grammars can occur. An output which appears variably and only in restricted contexts may become preferred, used more frequently in wider contexts, ultimately entrenched as a categorial part of grammar…"

4. Conclusion

The Salish languages of Tillamook and Twana and the Austroasiatic language Temiar essentially share the same consonant cluster reduction rule, even though these two language families are not in any way related genetically. This shows how languages may be different and same at the same time. Finding this unity in diversity of language has been one of the goals of modern linguistics, especially under the language typology and universals approach. In this paper, I have shown that how a study on conditions of universal phonological processes such as dissimilation and cluster simplification and their synergy can help achieve this goal more systematically. Although the superficial shapes of reduplication in these languages may look peculiar, their underlying structures show a standard formation by affixation, in conformity with the contiguity/locality principle of reduplication; the apparent peculiarities arise as a result of subsequent morphological and phonological rules that have reduced the shape of the reduplicant. In this sense, the paper also shows that reduplication is not much different from other affixational processes, except that the attached affix originates by copying from the base.

While the rule reducing a $C_1C_2C_1$ cluster by synergy of dissimilation and cluster simplification unifies what happens in truncated reduplications of Salish and Temiar, it is really the universal conditions on dissimilation and cluster simplification and their manifestation in each language that offer a coherent view of the unity and diversity of language. For example, the condition of sufficient similarity in dissimilation such as $| C_1 - C_3| \leq \delta |$, when applied on the rule $C_1C_2C_3 \rightarrow ØC_2C_3$, explains why the triconsonantal reduction occurs only between identical consonants in Salish and Temiar, even though the direction of the rule is sometimes reversed in the latter. This is because, with the value of the similarity condition set at $|C_1 - C_3| \leq 0$, identical consonants provide an optimal environment for dissimilation to occur between two consonants.

The condition also predicts that if a similar consonant cluster reduction occurs in another language, it will always occur first between identical consonants and then 'generalize', by relaxing the similarity condition $| C_1 - C_3| \leq \delta$. We have seen this rule generalization in action for the clusters with the Latin prefix *abs-*, e.g. Lt. *āmittō* <**abs-mittō* 'I send away' and Lt. *asportō* <**abs-portō* 'I carry off' (cf. Lt. portō 'carry'), where the same reduction occurs even when the two consonants are both labial but not identical. What this means typologically is that the diversification of the cluster reduction will occur only in one direction, by increasing the value of δ in the condition $|C_1 - C_3| \leq \delta$. The condition prevents the reduction occurring in a language when the two consonants are similar but not identical ($|C_1 - C_3|=1$) without it also occurring when they are identical ($|C_1 - C_3|=0$).

Similarly, the principle in cluster simplification that the longer a cluster is, it is more likely to undergo cluster simplification (Cn → Cn-1 where $|n| \geq \Delta$) predicts that cluster simplification will never occur to a group of three consonants without it also occurring to a group of four. Applied on the rule reducing $C_1C_2C_1$ cluster, this condition thus explains why the rule that reduces a triconsonantal cluster in Salish languages fails to do the same in Temiar, e.g. Tm. *kw-kɔ̄w*, although the same reduction occurs in a cluster of four or more consonants, e.g. Tm. *sglɔg* < **sg-slɔg* and Tm. *trwkɔ̄w* <**tr-kw-kɔ̄w*. Typologically, the diversification of cluster reduction thus occurs in an opposite manner of generalization, by decreasing the value of Δ in $|n| \geq \Delta$, but with the same restriction held on linguistically possible rule configurations.

Finally, we also learned that change of direction in rule application can also contribute to fashioning the diversity of language. We have all known that processes such as assimilation and dissimilation sometimes reverse their direction of application, but it is meaningful that such reversal of application, in conjunction with the tendency in cluster simplification that a middle consonant drops in a consonant group, e.g. Eng. *whistle* [wɪsl], can explain the intricate reduction of $C_1C_2C_1$ in Temiar quadri-consonantal clusters, eliding the first of two identical consonants in, e.g. Tm. *trwkɔ̄w* <**tr-kw-kɔ̄w* but the second one in, e.g. Tm. *sglɔg* < **sg-slɔg* and Tm. *srglɔg* < **s-r-g-slɔg*.

REFERENCES

BENJAMIN G. 1976. An Outline of Temiar Grammar. In P. Jenner, L. Thompson and S. Starosta (eds.). *Austoasiatic Studies 1*. Honolulu: The University of Hawaii Press.

___________. 2018. A New Outline of Temiar Grammar: Part 1. Ms. Retrieved from http://nanyang.academia.edu/GeoffreyBenjamin.

BLUST, ROBERT. 1998. Ca- reduplication and Proto-Austronesian grammar. *Oceanic Linguistics* 37.1, 29-64. Honolulu: The University of Hawaii Press.

_____________. 2006. Supertemplatic reduplication and beyond. In Henry Y. Chang, Lillian M. Huang, and Dah-an Ho (eds.). *Streams Converging into an Ocean: Festschrift in honor of Professor Paul Jen-kuei Li on his 70th birthday*, 439-460. Taipei: Institute of Linguistics, Academia Sinica.

BRESNAN, JOAN and JUDITH AISSEN. 2002. Optimality and functionality: objections and refutations. *Natural Language and Linguistic Theory* 20, 81–95.

Broselow E. and J. McCarthy. 1984. A theory of internal reduplication. *The Linguistic Review* 3, 25-88.

BUCK, C. D. 1933. *Comparative Grammar of Greek and Latin*. Chicago, ILL: The University of Chicago Press.

BYBEE, J. L., R. PERKIN and W. PAGLIUCA. 1994. *The Evolution of Grammar: Tense, Aspect and Modality in the Languages of the World.* Chicago, IL: The University of Chicago Press.

DIFFLOTH, GÉRARD. 1976. Expressives in Semai. *Oceanic Linguistics Special Publications* No. 13. Austroasiatic Studies Part I, 249-264.

DRACHMAN, GABERELL. 1969. *Twana Phonology*. Ohio State University Working Papers in Linguistics 5. Columbus, OH: Dept. of Linguistics, Ohio State University.

EDEL, MAY. 1939. The Tillamook language. *International Journal of American Linguistics* 10, 1-57.

EGESDAL, STEVEN M., and M. TERRY THOMPSON. 1998. A fresh look at Tillamook (Hutyéyu) inflectional morphology. In EWA CZAYKOWSKA-HIGGINS and M. DALE KINKADE (eds.). *Salish Languages and Linguistics: Theoretical and Descriptive Perspectives*, 235-274. Berlin: Mouton de Gruyter.

FOLEY, J. 1977. *Foundations of Theoretical Phonology*. Cambridge, UK: Cambridge University Press.

_______. 1981. *Philosophy of Linguistics*. ms. Vancouver, BC: Dept. of Linguistics, Simon Fraser University.

GAFOS, ADAMANTIOS. 1998. A-templatic reduplication. *Linguistic Inquiry* 29.3, 515-527.

GREENBERG, JOSEPH. 1966. Some Universals of Grammar with Particular Reference to the Order of Meaningful Elements. In J.H. Greenberg (ed.). *Universals of Language*, 73-113. Cambridge: MIT Press.

KIM, HYUNG-SOO. 1991. *Universal Phonological Processes: A Theoretical Analysis of Dissimilation, Cluster Simplification and Their Synergy for Consonant*

Cluster Reduction in Romance and Indo-European Languages. PhD Dissertation. Vancouver, BC: Simon Fraser University.

_______________. 2002. Underlying representations in glide formation in Korean: A reply to Cho (2000). *Studies in Phonetics, Phonology and Morphology* 8.1, 65-83. The Phonology-Morphology Circle of Korea.

_______________. 2003. A new look at partial reduplication in Korean. *Studies in Phonetics, Phonology and Morphology* 9.2, 353-380. The Phonology-Morphology Circle of Korea.

_______________. 2009. The Full-to-Partial Reduction in Korean and Turkish Reduplication. *Linguistic Research*. 26.2, 121-149. Seoul: The Language Research Institute, Kyunghee University.

_______________. 2017. The truncated reduplication in Twana: another case of synergistic weakening. A. Anghelescu, M. Fry, M. Huijsmans and D. Reisinger (eds.). *Papers for the International Conference on Salish and Neighboring Languages 52, University of British Columbia Working Papers in Linguistics 43*. 119-136.

KIM, HYUNG-SOO and DWIGHT GARDINER. 2016. The Truncated reduplication in Tillamook and Shuswap: weakening by synergy of dissimilation and cluster simplification. M. Huijsmans, T. J. Heins, O. Tkachman and N. Weber (eds.). *Papers for the International Conference on Salish and Neighboring Languages 51, University of British Columbia Working Papers in Linguistics 42*. 93-107.

MARANTZ, ALEC. 1982. Re reduplication. *Linguistic Inquiry* 13.3, 435-482.

MIYAKOSHI, K. 2006. Aslian reduplication as the emergence of the unmarked. *Kengo Kenkyu* 129, 43-89.

MCCARTHY, J and A. PRINCE. 1996. Prosodic morphology 1986. *Linguistics Department Faculty Publication Series 13*. Amhurst: The University of Massachusetts. Retrieved from https://scholarworks.umass.edu/linguist_faculty_pubs/13.

NELSON, NICOLE. 2005. Wrong side reduplication is epiphenomenal: evidence from Yoruba. In Bernhard Hurch and Veronika Mattes (eds.). *Studies on Reduplication*, 135-160. Berlin: Mouton de Gruyter.

RIGGLE, JASON. 2004. Nonlocal reduplications. *Proceedings of the North East Linguistic Society*, *NELS* 34, 485-496. Retrieved from https://doi.org/doi:10.7282/T3GT5PZF.

STERIADE, DONCA. 1988. Reduplication and syllable transfer in Sanskrit and elsewhere. *Phonology* 5, 73-155.

THOMPSON, LAURENCE C. and M. TERRY THOMPSON. 1985. A Grassmann's Law for Salish. *Oceanic Linguistics Special Publications* 20, 134-147.

THOMPSON, M. TERRY. n.d. *Tillamook-English Dictionary with English-Tillamook Glossary*. Ms. Honolulu: Dept. of Linguistics, University of Hawaii.

VAN EIJK, JAN. 1998. CVC reduplication in Salish. In Ewa Czaykowska-Higgins and M. Dale Kinkade (eds.). *Salish Languages and Linguistics: Theoretical and Descriptive Perspectives*, 453-476. Berlin: Mouton de Gruyter.

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