What looks like a CV must be a CV

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1. Introduction[1]

The OT analysis proposed in this paper attempts to provide an integrated account for seemingly dissimilar kinds of CV reduplication in Korean. The specific focus of this paper is to compare the reduplicative pattern of velar-final vs. coronal-final (especially liquid-final) roots and to show that different surface realizations of the CV reduplication in these two roots are a result of the interaction of constraints that are visibly active in the phonology of the language. Two such constraints are the template […CV.TVK], which guards against coronal codas and velar onsets in the final syllable of a mimetic word, and AlignRed, which guarantees a maximal adjacency of the reduplicant and its base.

Following the description and analyses of simple cases of CV reduplication in section 2, an OT account of reduplication with velar-final roots is proposed in section 3. Section 4 presents a problem of liquid-final roots, which do not conform to the general pattern of CV reduplication presented in the previous sections. Section 5 explores the mimetic stratum of the language, which serves a basis for an analysis of liquid-final roots in the following section (6). Section 7 discusses theoretical implications of the proposals made in this paper.

2. CV reduplication from open syllable bases

To denote emphasis, coda-less exclamatory expressions in Korean may repeat their final syllable. Examples are as follows, where syllable boundaries are marked with a period ".", and reduplicated morphemes are underlined and separated with a dash "-". I provide only one gloss but reduplication should be understood as to add emphasis or a feeling of exaggeration to the meaning of the base[2]

Table 1. Exclamatory expressions

base		reduplicated form	gloss
e.kye	→	e.kye-kye	'What an insignificant amount!, Is that all? (disdain)'
a.cu	→	a.cu-cu	'Get a load of that! Well, well.'
a.c^{h}a	→	a.c^{h}a-c^{h}a	'Oops, I forgot! (error)'
O.mO	→	O.mO-mO	'Oh, my gosh! (surprise)'
a.ko	→	a.ko-ko	'Darn! (error)'

The reduplicative pattern above seems to allow for a simple characterization. A melody-less reduplicative suffix CV (or "core syllable" la McCarthy and Price 1986) attaches to a base that ends in an open syllable (Marantz 1982). The suffix then copies the melody of the final syllable of the base. This generalization also works for the following mimetic forms that describe action/state or sound of an event, the base of which happens to be illicit in the language:

Table 2. Sound, state, or action descriptive words

base		reduplicated form	gloss
*U.si	→	U.si-si	'spooky'
*k'we.cwe	→	k'we.cwe-cwe	'grungy and poor-looking (clothes)'
*pu.si	→	pu.si-si	'sleepy and sloppy-looking (hair, face)'
*wa.ta	→	wa.ta-ta	'the way one runs away in a hurry (body condition)'
?c'i.p'u.tU	→	c'i.p'u.tU-tU	'under the weather, lacking exercise'

Some exclamatory expressions may geminate the intervocalic consonant of the base for emphatic purposes. As the base is reduplicated, so is the geminate segment:

Table 3. More exclamatory expressions (with geminated base)

base		reduplicated form	gloss
a**t**.c^{h}a	→	at.c^{h}a-t.c^{h}a	'Oops, I forgot!'
a**t**.c'u	→	at.c'u-t.c'u	'Don't even try! Don't overstrain yourself! (derog.)'
a**k**.k^{h}o	→	ak.k^{h}o-k.k^{h}o	'Darn!'
O**m**.ma	→	Om.ma-m.ma	'Goodness! Oops!'
e**t**.t^{h}we	→	et.t^{h}we-t.t^{h}we	'Yuck! Blech!'
a**t**.t'a	→	at.t'a-t.t'a	'Don't be that way! Come on! (disapproval)'
O**l**.le	→	Ol.le-l.le	'Why are you being/doing it that way?!'

This new set of data does not complicate the analysis proposed above if the onset of the final syllable of the base is analyzed as carrying a floating mora underlyingly. In other words, with or without the geminate segment in the base, the same reduplicative suffix CV can be added to the base. Comparing two attested forms such as *a.ko-ko* and *a.**k**^{h}o-k^{h}o* ([ak.k^{h}o-k.k^{h}o] on the surface) then, the base of the latter will carry an underlying floating mora associated with the *intervocalic* velar (marked bold), whereas that of the former will have no such specification. The following illustrates the association of the floating mora in a step-wise fashion:

m		m		m m		
\		\		\ /		
a.k^{h}o	→	a.k^{h}o-CV	→	/a.k^{h}o-k^{h}o/	→	[ak.k^{h}o-k. k^{h}o]
BASE/INPUT		BASE-RED		copying		OUTPUT

A prudent reader may have noticed a quality change in the geminate segment (k.k^{h} cf. *k^{h}.k^{h}). This may be ascribed to the language's ban on complex features in the coda position. As is well known, Korean allows no marked laryngeal features in the coda position as well as the feature [+cont]. The geminated segment, reflecting this fact, is realized as a simple velar stop in coda but with all its underlying features fully specified in the onset position: ie., [+cont] and laryngeal features.

The contention that the onset of the final syllable of the base carries a floating mora underlyingly is supported by the data. If there were no mora associated with the onset of the final syllable, the reduplicative suffix CV should (be able to) copy only the final syllable (CV) of the base excluding the preceding coda, contrary to the actual data, as in the following:

at.c^{h}a	→	*at.c^{h}a-c^{h}a	(expected)	c.f.	at.c^{h}a-t.c^{h}a	(attested)
Om.ma	→	*Om.ma-ma	(expected)	c.f.	Om.ma-m.ma	(attested)

In sum, it is safe to assume that the same reduplicative suffix, namely CV, is at workas long as the base ends in an open syllable, regardless of the geminateness of the intervocalic segment of the base.

3. CV reduplication from closed syllable bases

In the cases of open-syllable base, as shown above, the CV RED suffix simply attaches to the end of the base, whether the base carries an underlying mora or not. When the base ends in a consonant, the picture gets a little more complicated, as the suffix CV has to attach either to the end of the base or to the final syllable of the base *excluding* its final consonant. Some examples follow:

Table 4. More sound, state, or action descriptive words (closed syllable base)

base		reduplicated form	gloss
tuN	→	tu-tu-N	'a sound of a drum'
p'aN	→	p'a-pa-N	'a sound of an explosion'
a.sak	→	a.sa-sa-k	'a sound of a crispy bite'
p^hyoN	→	p^hyo-pyo-N	'a sound of a small object fast flying'

In an Optimality theoretic account for the closed-syllable-base reduplication (Kim 1996), I argued that the reduplicative suffix CV surfaces as an infix (ie., before the final consonant) because an alignment constraint (RightMost) that would normally dictate right-edge attachment of a suffix is dominated by constraints FinalC and NoCoda. FinalC was proposed to ensure that the output form ends in coda, capturing the insight that a vast majority of mimetic words end in a closed syllable. NoCoda was proposed to derive the reduplicative template shape CV. A congruous analysis for reduplication in general, however, demands some other constraint than NoCoda, as the high-ranking of NoCoda cannot explain why CVC reduplication is possible at all (e.g. **twi.suN* → *twi.suN-CVC* → *twi.suN-suN* 'ominous, uneasy feeling'.

What motivates infixation seems to be a constraint that drives a reduplicant to be maximally adjacent to its base. After all, reduplicants resemble (part of) their base, and it is unlikely that the "copying" of the melody occurred long distance. Respecting the maximal adjacency between the reduplicant and the base, the constraint AlignRed is defined as follows:

AlignRed*: Reduplicated Segments are maximally adjacent to the material being copied*

RightMost: *Affixes attach to the right edge of the stem*[3]

With the AlignRed ranking higher than the constraint that dictates rightmost suffixation, then, the form is chosen that respects AlignRed, as shown in the tableau below. In the optimal (second) form, the reduplicant comes abutting the material being copied, with no segment intervening:

Tableau 1.

/a.sak-RED/	AlignRed	RightMost
a.sak-sa	*!	
☞a.sa-sa-k		*

Before introduction of problematic data with liquid-final bases, laryngeal feature loss in the reduplicant must be addressed. The form *p'aN* reduplicates as *p'a-pa-N* as shown in Table 4 above. In Kim (1997), I proposed a constraint ranking as an explanation for the laryngeal feature loss: the emerging markedness constraint No-Lar prevents marked features from occurring in copied segments, although the features underlyingly specified on the base have to surface because of the high ranking feature faithfulness constraint Ident-IO (Definitions of the constraints are given below the tableau):

Tableau 2.

/p'aN-RED/	Ident-IO(Lar)	No-Lar	Ident-BR(Lar)
p'a-p'a-N		**!	
☞p'a-pa-N		*	*
pa-p'a-N	*!	*	
pa-pa-N	*!		

Ident-IO(Lar)*: Output correspondents of an input [Lar] segments are also [Lar]*
No-Lar*: Marked feature (Laryngeal, specifically) are banned*
Ident-BR(Lar)*: Reduplicant correspondents of a base [Lar] segment are also [Lar]*

Jun's (1994) Metrical Weight Consistency proposal was rejected in Kim (1996) on the ground that historical as well as synchronic evidence provided for the geminacy of the laryngealized segment (e.g. *p'a-**p'a**-N*) was not sufficient. Recall that in section 2 above, I analyzed forms like *ak.k^{h}o* and *at.c'u* as containing geminate segments intervocalically. Note also that in these forms, the *base* contains geminate segments intervocalically.

In a form like *p'aN*, however, there is no reason (and no evidence, for that matter) to posit an underlying floating mora, which will be deleted somewhere in a derivational step, without ever making it to the surface. That there is no floating mora associated with the segment *p'a* is consistent with the analysis advanced so far. If there were mora association, *p'a-p'a-N* would be expected, just as the case of geminated exclamatory expressions in section 2. It is the marked laryngeal feature ([+cg] in the case of *p'aN*) that is disappearing in the reduplicant, *NOT* a whole skeletal slot.

To summarize the points made so far, if the base ends in an open CV syllable, the reduplicative suffix CV will copy the melody of that syllable (Tables 1 and 2). If the base happens to bear a floating mora associated with an intervocalic segment, that trait will also be copied onto the reduplicant (Table 3). Finally, if the base ends in a CVC syllable, the final coda consonant of the base will fail to be copied in order to conform to the shape requirement imposed by the reduplicative suffix CV. The site of suffixation will also look anomalous, with the suffix being infixed between the base and the final segment. The effect of infixation is obtained because the reduplicated CV should be maximally close to the base melody.

One final piece of supporting evidence for the relatedness of these patterns comes from the fact that multiple reduplication is possible in all cases, which can be clearly analyzed as CV reduplication, as pointed out by other researchers (Lee 1992, Sien 1998).

4. Problematic data: liquid-final (closed syllable) bases

The generalization provided in previous sections implies that any roots ending in CVC syllable will reduplicate the final syllable minus its coda, when CV reduplication is called for. If the coda consonant of the root is a *liquid*, however, a slightly different pattern of CV reduplication is attested. Instead of copying the final syllable minus its coda, the reduplicative suffix copies an epenthetic vowel along with the final consonant now resyllabified as onset.

pan.cil	→	pan.ci.lU-lU	(attested)	‘sleek, glossy, slick, oily, smooth’
	cf.	*pan.ci-ci-l	(expected)	

The following is a list of liquid-final roots with this pattern of reduplication:

Table 5. More sound, state, or action descriptive words (liquid-final, closed-syllable base)

root	gloss	root	gloss
p^{h}ul	‘horse’s sigh’	pul	‘trembling of an entity of substantial size’
p^{h}ol	‘a bird flitting off a tree branch’	pal	‘trembling of a small entity’
sal	‘subtle, smooth way’	sol	‘drifting off to sleep’
s'al	‘a subtle, weak pain in the belly’	ul	‘thundering’
tol	‘rolling of a small object’	tul	‘wrapping of an object’
cul	‘dribbling’	c'ol	‘small stream of water flowing’
c^{h}wal	‘like flipping pages of a book’	c'il	‘a feeling like electric shock or electricity’

Table 5. cont.

root	gloss	root	gloss
pan.cil	'sleak, slick, glossy'	pOn.tUl	'lustrous, glowing, burnished, polished'
p'On.cil	'polished, practiced behavior'	t'e.kul	'rolling of an object'
pu.kUl	'boiling over, fuming with anger'	p'okUl	'drowning'

In the following section, I explore the broader issue of the mimetic stratum in Korean, which provides a clue to the puzzle of liquid-final root anomaly of reduplication with an epenthetic vowel. The quality of the final consonant of the root (ie., coronal) is found to be very relevant to why *cul* 'dribbling', for example, reduplicates as *cu.lU-lU*, and not **cu-cu-l*.

5. Affixation and the mimetic stratum in Korean

This section briefly explores a rich stratum of the Korean lexicon, which is sometimes referred to as onomatopoeic or mimetic (Jun 1994), or ideophonic (Sien 1998, Lee 1992). Two salient characteristics of this stratum are the shape of the (final) syllable of words and the order of the suffixed segments. Examination of over 2,000 personally collected reduplication data reveals that most roots in the mimetic stratum have the shape of …CVC (ie., heavy root-final syllable).

In the majority of the cases where the root *can* stand alone as an independent word, the final consonant is predictably velar. If the root ends in coronal, it either is fully reduplicated (e.g. *cul* 'dribbling' → *cul-cul* 'continuous dribbling') or takes suffixes of the typical shape VC (*cul-uK* 'dribbling to a stop'). Interestingly enough, if the root ends in coronal and takes more than one suffix, the affixes show a fixed order, revealing the following template shape after resyllabification:

…C-V.T-VK, (T being any coronal and K being either *k* or *N*)

Sien (1998) claims that ideophones or mimetic roots take dorsal and alveolar affixes, whose semantic intensity appears to vary inversely relative to the consonant strength hierarchy. Unlike Jun (1994), who proposes a CVC suffix, or Lee (1992), who proposes various suffixes C, VC, and CV, Sien's affixes are invariably of the shape C, yielding VC after vowel epenthesis. There seem to be some data, however, that point to (V)C rather than CVC suffixation.

First, consider the the example *pa.sak* 'rustling', which has two related forms formed via VT affixation (*pa.sak* → *pa.sU.lak* ~ *pa.si.lak*). If CVC were affixed, as Jun claims, two base forms **pa.sil* and **pa.sUl*, would have to be posited, which are semantically and phonologically anomalous. Additionally, deletion of the base-final segment *l* would have to be assumed. On the other hand, if the coronal (*l*) is posited as an affix (Sien 1998), the variation in vowel quality is simply a matter of epenthesis and incomplete feature filling.

Another supporting piece of evidence for (V)C rather than CVC suffixation is alternation among coronals in Korean. As the following etymologically related words show, the enigmatic coronal coda of the root (here posited as something close to lateral fricative) is realized as *l*, *t*, or *c* in the onset position.

kaT 'divide' → l: ka.l-u (powder), ka.l-ak (strand, branch), kal.l-e (branch, division), ka.lU-ta (divide)
t: ka.t-ak (strand)
c: ka.c-i (branch)

In examples such as *ul.kUs* → *ul.kU.lak* 'red-ish' and *man.cis* → *man.ci.cak* 'fiddling', Jun posits CVC suffixes *-lak* and *-cak* respectively, which are attached to the base *ul.kU**s***- and *man.ci**s***-, after the deletion of the base-final consonants (in bold). I contend, however, that positing a versatile mother segment (T) helps explain, although it cannot predict, the historical split into

other coronal consonants in the language. According to such a hypothesis, *ulkUs* can be reanalyzed as follows:

root	-VK suffix	gloss
ul.kUT	ul.kUT-**ak**	red-ish

The affixation pattern presented above makes even more sense, when the root for *ul.kUs* is traced further back to the form *pulk* 'red, bright'. As Sien would argue, *ul.kU.lak*, then, can be viewed to have undergone the following affixation process:

root	-VT suffix	-VK suffix	gloss
(p)ulk	(p)ul.k-**UT**	(p)ul.k-**UT**-**ak**	red-ish

Returning to the closed syllable root, I will assume the shape to be of mimetic suffixes to be VC for the reasons discussed above. As mentioned above, coronal (T) or coronal-final suffix (VT) attached to the root can be extended by the addition of a velar-final suffix (VK). Consider the root *kVp*, with the meaning 'be bent'. Its synchronic cousins can be found in the following words in Korean[4]:

kup-ta 'be bent'
kop-ta 'stiff, numb, cramped (the state of fingers cramped and bent from cold)

root	-T suffix	-K suffix	-T-K suffix
kVp 'bent'	kVp-**uT** 'bend-ish'		ku.p-**u**.**c**-**ON** 'with a slump, bent body shape' ko.p-u.l-**aN** 'wiggly, winding'
(k)Vmc 'budge'	(k)Vmc-**iT** 'small movements'	(k)Vmc-**ak** 'budge'	(k)omc-**il**-**ak** 'fidgety small movements'

As can be seen clearly in the second example 'budge' (*(k)Vmc-**iT*** and *(k)Vmc-**ak***), although coronal and velar suffixes *can* attach to the root independently, when they come together, they have to do so in the fixed order (coronal-velar). Because Korean has very little tolerance towards onsetless syllables, resyllabification is a must whenever possible. Thus the result of resyllabification yields the template shape …CV(C). TVK. In conclusion, the predominant shape of the final syllable of mimetic words consists of coronal onset and velar coda.

6. Proposal: Paradigm-leveling of mimetic stratum

An examination of the mimetic stratum in the previous section has revealed a template shape …CV(C).TVK, the output of resyllabification and double affixation in many cases. From this I deduce that there is a strong paradigm-leveling effect in the mimetic stratum, where the output of word formation processes, suffixation or reduplication, is strongly constrained to ban coronal codas and velar onsets. To obtain this effect, I propose a constraint Optimal Syllable:

OptSyll*: Optimal (final) syllable shape is …TVK in the mimetic domain*

The following two tableaux, with the contraint OptSyll highest ranking, account for the apparent discrepancy in reduplicative strategy taken by coronal (liquid)-final root *sa.lU-lU* 'gently' (cf. **sa-sa-l*) and velar-final root *sa-sa-k* 'stealthily, ducking' (cf. **sa.kU-kU*):

Tableau 3.

/sal-RED/	OptSyll	AlignRed	RightMost	Dep-IO
sal-sa		*!		
sa-sa-l	*!		*	
☞sa.lU-lU				*

In the above tableau, the first candidate *sal-sa* loses out, as it violates the undominated constraint AlignRed (See Tableau 1, p. 3 for a shorter version). The second candidate *sa-sa-l* also fatally violates the other high ranking constraint OptSyll and loses out. The third candidate *sa.lU-lU*, on the other hand, is selected optimal --it incurs no violation of high ranking constraints OptSyll (by having no coronal codas or velar onsets in the final syllable) nor AlignRed (with the reduplicant coming abutting the base). Although it introduces a novel segment that is not present in the input, to the violation of the constraint Dep-IO, the violation is trivial.

The same constraints and their ranking account for the ill-formedness of *sa.kU-kU*. As seen in the following tableau, reduplicating the root-final consonant along with the epenthetic consonant introduces a velar onset in the final syllable, an unlawful final syllable shape militated against by the constraint OptSyll:

Tableau 4.

/sak-RED/	OptSyll	AlignRed	RightMost	Dep-IO
sak-sa		*!		
☞sa-sa-k			*	
sa.kU-kU	*!			*

In sum, the constraint OptSyll, which is directly derived from the shape of the majority of the mimetic vocabulary, provides a way to account for why seemingly different reduplication patterns are adopted by velar-final vs. liquid-final roots.

7. Conclusion

In this paper, I have attempted to provide an integrated account for apparently divergent CV reduplication patterns in Korean. I have compared the reduplicative pattern of velar-final vs. coronal-final (especially liquid-final) roots and shown that different surface realizations of the CV reduplication in these two roots are a result of the high ranking templatic constraint […CV.TVK]. This constraint enforces the ban on coronal codas and velar onsets in the final syllable of a mimetic word, while AlignRed makes sure that the reduplicant comes abutting its base. In the process of showing that, I heavily relied on Sien's (1997) analysis of the Korean mimetic stratum and offered a modestly novel interpretation of historical alternation of coronal consonants in Korean

Notes

[1] I would like to thank Emily Curtis for providing insightful comments on various versions of this paper and engaging in many helpful discussions with me. Thanks also go to Sharon Hargus for her comments on the first draft of this paper, and Gabriel Webster, who helped me with my last-minute homepage. All errors are solely mine.

[2] In this paper, I used O for low central, U for unrounded high central vowel, K for any velar, T for any coronal, and finally, N for velar nasal segment.

[3] RightMost = AlignStemRight, where AlignStemRight is defined as Align (Stem, R, Affix, R).

[4] Since the surface realization of the underlying vowel is either [o] or [u], I give only [+back] for the vowel specification. For detailed research on phonetic play, see Sien (1997) and Lee (1992).

References

Jun, Jongho. 1994. Metrical weight consistency in Korean partial reduplication. Phonology 11:69-88.

Kim, Soohee. 1996. Korean partial reduplication. CLS 32:179-189.

Kim, Soohee. 1997. Emergence of the markedness constraint No-Lar and its split behavior in the reduplicative domain. WECOL proceedings.

Lee, Jinseong. 1992. Phonology and sound symbolism of Korean ideophones. Doctoral dissertation. Indiana Univerity. Seoul: Hanshin Publishing Co.

Marantz, Alec. 1984. Re reduplication. Linguistic Inquiry 13:435-82.

McCarthy and Prince. 1984. Prosodic morphology. Ms., University of Massachusetts and Bradeis University.

Sien, Namcheol. 1998. An Autosegmental Analysis of Ideophones in Korean. Doctoral dissertation. University of Washington.