

# The evolution of /r/ final verbs in Korean

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## 1 Background

One of the long-standing conundra of Korean phonology is the ambivalency of /r/<sup>1</sup>: it usually acts as a consonant, but when it is placed within verbal stems, it behaves like a vowel. When a vowel-final verb is combined with a /i/-initial suffix, /i/ is deleted (1a). When a consonant-final verb is combined with a /i/-initial suffix, on the other hand, /i/ remains intact (1b). However, despite the consonantality of /r/, /i/ of /i/-initial suffix is deleted when a /r/-final verb is combined with it (1c).

- (1) a. ka- 'to go' + -imjøn → ka-mjøn  
b. mæk- 'to eat' + -imjøn → mæk-imjøn  
c. kar- 'to plow' + -imjøn → kal-mjøn

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<sup>1</sup> /r/ here represents a phoneme that is phonetically realized as a flap in onset and a lateral liquid in coda in Present Day Korean. The use of /r/ in this paper entails my neutral position of setting one of them to be a basic phoneme and the other derived.

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Since /r/ acts as a consonant in other domains such as case marker selection, the idiosyncratic behavior of /r/ has garnered much attention from Korean phonologists. The widely accepted view was developed by generative phonologists, Lee (1979) and Lee (1981). Focusing on the SPE's feature specification of /r/, which states [+vocalic, +consonantal], Lee (1981) argued that the /i/-deletion rule refers only to the [+vocalic] feature, becoming blind to the [+consonantal] of /r/, whereas the case marking rule is sensitive to the [+consonantal] feature. This argument, at first glance, seems to provide a decent account for the Janusian nature of /r/, but it represents more of a fancy description of the situation than a phonological explanation. It tells us nothing about the reasons that twofold sensitivity of /r/ arises. Several studies on this issue under the framework of generative phonology have been proposed (Kim-Renaud 1982, Ahn 1985, Ahn 2008, among others), but they suffer from the same problem disclosed by Lee's (1981) study.

## 2 Paradigmatic Approach – Homophony Blocking

Another line of research, referring to the paradigm of verbal stems, has been put forth recently by Kenstowicz & Sohn (2007). They paid attention to the suffixed form of verbal stems, and found out that if /r/-final stems behave as consonant-final stems they will induce homophony with /ri/-final stems. This is illustrated below in (2):

(2)	/i/-initial suffix	/a/-initial suffix
kari- 'to split'	a. kari-mjøn	c. *kal-a (kall-a)
kar- 'to plow'	b. *kar-ɪmjøn	d. kal-a

They argued that the functional motivation for keeping the two classes (/r/ vs. /ri/) distinct in that the output nullifies the phonotactic requirement of Korean. This approach also accounts for the exceptional behavior of /ri/-final stems in front of /a/-initial suffixes (2c) in that ambiguity will arise if prevowel /i/-deletion is not blocked. Under the Optimality Theoretic framework, they proposed a kind of anti-merger constraint called UNIQUE PARSE which blocks convergent input-output mapping in the same vein as Crosswhite (1999) and Alderete (2001), and others. Ha (2012) elaborated the idea, although studied independently, and reached the same conclusion that an invisible force not to induce homophony is in effect.

Their novel argument is explanatory in that it gives explanation to two seemingly irrelevant irregularities at once, but it shows both conceptual and functional weaknesses. First, although /r/-final verbs can avoid homophony with /ri/-final verbs by ignoring phonology, this choice also gives rise to homophony with vowel final verbs because of the existence of the /r/-

deletion rule before /n/ (e.g. /ka-/ ‘to go’ + /-ini/ → [kani], /kal-/ + /-ini/ → [kani]). Ha (2012) pointed out that the amount of potential /r/-/ri/ homophony is larger than /r/-/V/ homophony, but it still poses the problem on the validity of their analysis and the proposed constraint. Second, whereas the popular examples of homophony blocking of Crosswhite’s (1999) and Alderete’s (2001) are both intra-paradigmatic cases, this one is inter-paradigmatic homophony blocking. Intra-paradigmatic homophony blocking makes much sense in that it can possibly obliterate otherwise transparent grammatical relations, which severely threaten the disambiguation function of the language. Inter-paradigmatic homophony, however, is not so different from nominal homophony in that both do not have their functional correspondents confused. In fact, as Ohala (1993: 263) pointed out, languages “teem with” this kind of homophony without suffering any apparent distress. Third, the very same behavior of /r/ is observed when a noun combines with a postposition /-iro/ (e.g. /mur/ ‘water’ + /-iro/ → [mullo], not [\*muriro]) which clearly does not induce any homophony. This alludes to the fact that the vowel-like behavior of /r/ in a certain morpho-phonological domain is consistent. Lastly, there are actually many /ri/-final verbs which used to be /r/-final verbs and vice versa. For example, /kəsiri-/ ‘to go against’, /kuri-/ ‘to roll’, /səturi-/ ‘to be hurry’ used to be /r/-final stems (see Jang 2002 for an alternative explanation), and /t’ari-/ ‘to pour’ was reanalyzed as /t’ar-/ in some dialects according to Kim (2001). That means the functional constraints proposed by Kenstowicz & Sohn (2007) or Ha (2012) have limitation on its applicability and effect.

### 3 Toward a historical approach

If someone compares the alternation pattern of Middle Korean (MK) verbal stems with Present Day Korean (PDK), she can easily notice that even though there are minor differences, it is fundamentally the same, i.e., the /r/-final stems pattern with the vowel-final stems. Then the homophony avoidance account can be applied to the MK system, too. If anything, it suffered from a fifth objection. MK was a tone language, and the tone of /ri/-final stems and /r/-final stems differ: while /ri/-final stems are LL, /r/-final stems are LH when they join with a suffix vowel, which means that they were not a homophonous pair in MK. Since /r/ acted as a true consonant in case marking, it can be said that the stem alternation pattern has already been morpho-phonologized even in MK. In the later stages, the fact that this alternation pattern has been prevailing even though the homophone arised because of the loss of tone strongly supports that the irregularity of /r/ and /ri/-final stems has nothing to do with homophony. I further assume that the irregularity of those stems in PDK is not because of the synchronic interaction of constraints, but because of the fact that they

are directly inherited from MK. There is no reason to suppose any radical change in alternation pattern since it was not based on phonotactics or phonetics already in MK.

In this section, I will attribute the reason that /r/ pretends to be a vowel to the phonetic value of /r/ when the alternation pattern was established through examining the phonological processes of MK. To cut to the point, the phonetic value of /r/ was flap in the coda position when the alternation pattern was formed. Because the transitional vowel after flap was treated as a full vowel, the alternation pattern of /r/ follows the vowel pattern, and this alternation pattern persists even after syllable final /r/ became /l/ during MK (or Ancient Korean) through PDK.

The first evidence comes from the co-occurrence restriction of MK. Lee (1960) pointed out that there were very few /rVr/ words in MK due to /rVr/ > /rV/ dissimilatory deletion. According to his survey, there were only six /rVr/-final stems, while sixty /rV/-final stems existed. He also suggested several lexical traces of dissimilation ensuring the existence of the process. The first trace is the dual exponence of some verbs such as /nirir-/ ~ /niri-/ ‘to arrive.’ The second is the converbal form of some color terms: /phiri-ta/ ~ /phirir-ə/ ‘blue’, /nuri-ta/ ~ /nurir-ə/ ‘yellow.’ The last trace comes from the words from Jeju dialect: /hλru/ ~ /hλrɪr/ ‘one day’, /kλru/ ~ /kλrɪr/ ‘powder,’ etc. The co-existence of the /rV/ form and the /rVr/ form indicates that many /rV/ form might actually come from /rVr/ form, and firmly supports the occurrence of dissimilation. Regardless of viewing the motivation of dissimilation process as constraint interaction (Suzuki 1998) or a rebound from the fear of assimilation (Ohala 1981), it occurs to avoid the surface phonetic similarity provoking articulatory or auditory difficulty. Furthermore, given the output of [...r...r...] dissimilation is usually [...r...l...] or [...l...r...] as in Latin, the final consonant is not supposed to be a liquid: it should be a flap or at least a rhotic sound.

The second piece of evidence that the /r/ was pronounced as a flap in coda is drawn from the natural classes in which /r/ participates. Unlike PDK, /r/ in MK caused the lenition of the following /k/ and /p/ to /h(x)/ and /β/, respectively. The lenition is also caused by palatal approximant /j/ and voiced dental fricative /z/ (e.g. *morh(x)[←k]aj* ‘sand’, *kλzh(x)[←k]aj* ‘scissors’, *tajβ[←b(p)]əm*, etc.). If we define the term “natural class” as ‘a group of sounds in an inventory which share one or more distinctive features, to the exclusion of all other sounds in the inventory (Mielke 2008:12)’, the features that /r/, /j/, and /z/ have in common is [+voiced] if

we understand /r/ as a liquid.<sup>2</sup> But this specification cannot rule out the nasal coda or vocoids, thus /r/, /j/, and /z/ could not form a natural class. If we regard /r/ as a flap, the vowel-like nature of the last half of /r/, /j/, and /z/ make us analyze them as vowels. Indeed, the lenition process also occurs intervocally. In addition, according to the survey conducted by Kirchner (2001) and Gurevich (2004), while the liquid family usually triggers fortition, the rhotic family usually triggers lenition.

The third and fourth pieces of evidence are dialectal: Gyeongju (Southeastern) and Hamgyeong (Northeastern). Consider the latter first. Hamgyeong dialect is thought to be a dialect that retains some phonological features of MK. It did not undergo palatalization until recently, still retains the tone system, and so on. One such residue is the sound value of /r/. Many previous studies on Goryeom (Hamgyeong speakers living in Central Aisan areas) and Yukjin speakers as well as Hamgyeong speakers reported that they pronounce the syllable final /r/ as a flap [ɾ].<sup>3</sup> This seems to be due to the persistence of MK pronunciation which is likely to be preserved in isolated regions.

It is reported that the Gyeongju dialect has two phonologically conditioned accusative marker, *-ro* after vowels and liquids and *-il* after consonants. Given the fact that the allomorphs of the accusative marker in MK are *-ir* (*-AR*) or *-rɪr* (*-rAR*), the *-ro* form of the Gyeongju dialect needs explanation. It seems that there was a metathesis sound change of /r/ and a vowel (*-ro* > *\*-ri* > *-ir*) because of perceptual ambiguity caused by the flap's relatively long durations. This is quite likely that the distribution of the two markers is exactly same as that of *-ir* and *-rɪr* in other dialects and MK.<sup>4</sup>

The last piece of evidence of a flapped coda can be directly drawn from the phonology of syllable final consonant clusters in MK. The only consonant clusters that can be located in the syllable coda position are /rX/ and /Xs/. *molk.ti*, *pork.te.la*, *wolm.kwo*<sup>5</sup>, etc. are attested in MK texts (Lee 1998:146-7). But the front part of the consonant clusters were deleted in the later stage, which indicates that there was a sound change in syllable-final /r/. This would be the change in phonetic value from flap to liquid.

<sup>2</sup> According to Mielke (2008), the continuancy status of lateral liquid is not inherent. Lateral liquids pattern with both continuants and non-continuants by the ratio of approximately 55 percent versus 45 percent.

<sup>3</sup> This sound is heard as having final vowel for untrained speakers of other dialects

<sup>4</sup> See Hwang (2011) for an alternative explanation. He relates it to the instrumental case *-ro*. He argues that *-ro* marks objects of MK. But the characteristics of MK *-ro* marking and Gyeongju dialect *-ro* marking are fundamentally discriminated. See Kim (2013a) for a discussion of Middle Korean non-canonical object marking.

<sup>5</sup> Yale romanization is used for MK examples, since it reflects the transcription of the text. The dots represents the syllable boundary.

Through analyzing the evidence above, we reach to the conclusion that /r/ was always a flap [ɾ] without reference to its syllable position. According to Blevins & Garret (2004), flap not only has a long durations but also has a transitional vowel before and after the constriction. This ambiguous acoustic feature can be misinterpreted. If the widespread assumption that unreleased coda stops of Korean was originally released is correct, a generation in the middle of this change would have trouble recognizing the nature of /r/. This misperception caused by the inherent acoustic characteristics of flap led to the bizarre behavior of /r/-final stems.

One thing that should be noted is the exact time that the syllable coda /r/ was changed to liquid. Even though the three pieces of evidence above are witnessed in the MK period, they cannot be treated as a sufficient condition for concluding that /r/ was flap in this period, since two of them are static constraints, and the other is a morpho-phonological rule. They cannot be said to refer to the phonetic value of MK. /r-k/ was not a bad sequence of MK, and some /rX/ consonant clusters were already reduced to /X/. Therefore, it can be tentatively concluded that the sound change of /r/ occurred before the MK period.

In the next section, I move onto the question of why verbal stems, not nominal stems retain the old morpho-phonological patterns.

#### 4 The lexical representation of verbal stems

So far I have argued that the vowel-like behavior of /r/-final stems is derived from the phonological pattern of /r/ before the rule was morpho-phonologized. The equivocal acoustic feature of /r/ made it come to be interpreted as a vowel. Subsequently, the syllable final /r/ changed its implementation to a lateral liquid, but the fossilized morpho-phonological pattern could not keep up with the sound change. This led to it ending up with the label of “irregular verb.” At the same time, one can easily find it unusual that nominal stems successfully caught up with the sound change, acting as a good consonant in contrast to verbal stems. The reason for the different behavior of /r/ in a verbal stem and a nominal stem seems to reside in the different ways of dealing with their lexical representations.

Kang (2006), on the basis of the paradigm levelling data of Korean verbal stems, argued that the Korean verbal stems tend to be leveled toward the allomorph appearing before the *-a* suffixes as in (3). (S) and (I) indicate the standard forms and the innovative forms, respectively [(3a) is drawn from Choi 1998, (3b) is drawn from Lee 1970 and (3c) is drawn from So 2004].

(3)	<i>a</i> -suffix	<i>i</i> -suffix	C-suffix
a. (S)	hæ	ha-ni	ha-ku ‘to do’
(I)	hæ	<b>hæ-ni</b>	<b>hæ-ku</b>
b. (S)	to:p-k’o	tou-ni	tow-ase ‘to help’
(I)	tow-ase	tou-ni	<b>tou-ko</b>
c. (S)	palg-ara	pari-mu	pari-ti ‘to apply’
(I)	palg-a	---	<b>pargi-ci</b>

(3a) and (3b) are examples of Gyeonggi Dialect, and (3c) is an example of Yeonbyeon Dialect. In each levelled paradigm (I)s, it is shown that the forms appearing before *a*-suffixes replace stems before other suffixes. Kang (2006), in turn, under the Single-Base hypothesis of Albright (2002), concluded that the base of the verbal paradigm is the one with an *a*-suffixed form. In the case of nominal stems, on the other hand, the base is the one without case markers, which is the reason for stem final neutralization in contrast to verbal stems (Albright 2002, Jun 2010). When the reanalysis based on the ‘base’ fails, the paradigm leveling occurs.

Based on these idea, I attributed the differences found in morphological change between nominal and verbal stems to the structure of lexical representation in the lexicon in Kim (2013b). Four different aspects of morphological changes between nominal and verbal stems are provided.

- (4) a. There is a spirantization process of coronal final nominal stems, but there is no such process in verbal stems.  
 b. There is a loss of stem final /h/ in nominal stems, but there is no such process in verbal stems.  
 c. There is a loss of stem final consonant clusters in nominal stems, but there is no such process in verbal stems.  
 d. There is a hypercorrection involving the stem final consonant clusters in nominal stems, but there is no such process in verbal stems.

I related it, however, directly with language acquisition. In other words, since learners never had opportunity to hear the isolated form of the verbal stems, they remember them with suffixed forms. Nominal stems, on the other hand, can be heard as case-marked or isolated forms, but the learners treat the isolated form as a unit.<sup>6</sup> The stem-final consonant of verbal stems are immune to the phonotactic constraint of PDK, for the causing environment is already contained in the stem. It follows Bybee’s (2001)

<sup>6</sup> But it seems that adpositional forms tend to be remembered as a whole (e.g. mullo, \*muriro, persistence of the pronunciation of stem final consonants [pat<sup>h</sup>-e, sot<sup>h</sup>-e, ...])

statement that once phonological processes are learned, speakers tend to prefer morphological to phonological conditioning. As Kang (2006: 194) emphasized, the leveling can be understood as “restructuring of the stem’s UR.”

The possibility was also proposed that at least for some stem classes grouped by their stem final consonants, the base is probably *i*-suffixed form, not *a*-suffixed as Kang (2006) argued.

- (5) a. kap-k’o, kap<sup>h</sup>-ini, kap<sup>h</sup>-a > **kapi-ko**, kap<sup>h</sup>i-ni, kap<sup>h</sup>-a  
 b. k’ak’-k’o, k’ak’-ini, k’ak’-a > **k’ak’i-ko**, k’ak’-ini, k’ak’-a

The examples in (5) are dialectal data drawn from Baek (2013), showing that the leveling tends to direct *i*-suffixed form. She also argued that the relative rate of the /i/ insertion is highest in aspirated and tensed final stems and decreases in *s, c > t, p, k > h* order. This order coincides with whether the consonants in question have neutralized to lenis or not (aspirated, tensed, *s, c* vs. *t, p, k*). The failure of the application of morphological rule, /i/ deletion, corresponds to the base results in the leveling of the paradigm. In this sense, we might as well say that speakers use *i*-suffixed listing as a maneuver to derive the whole paradigm more easily.

Although the choice of the base between *i*-suffixed or *a*-suffixed should be determined on an empirical basis, and the argument here does not deny the superior status of *a*-suffixed forms in several stems, it is worth noting that the /i/-suffixed base argument holds a better position from a theoretical perspective. If the base is an *a*-suffixed form, the /a/-deletion rule is needed to derive C or *i*-suffixed forms. Comparing the /a/-deletion rule with the /i/-deletion rule, which is needed for *i*-base hypothesis, /a/-deletion rule would place a burden on the learner because this rule is not applicable anywhere other than in deriving the stem before C-suffixes. On the other hand, the /i/-deletion rule is active in Korean morpho-phonology, so the computational load is minimized.

Meanwhile, in Kim (2013b), I did not rule out the possibility that multiple bases serve as a basis for formulating a single paradigm. This is from the blending data, such as (6).

- (6) təp-ko, təu-ni, təw-əsə > **təup-ko**, təu-ni, təw-əsə



In some level of derivation, phonological or morphological, the one before C-suffixes clearly proves its existence.<sup>7</sup>

Now, turn to /r/-final verbal stems. From the above discussion, we can simply state that /r/-final verbs are listed as /Xr-/ since *i*-suffixed form is one without /i/ since there is no /i/ in /i/-suffixed form. The output, however, is unnatural in the light of the phonotactics of PDK, remedied forms occasionally occur (e.g. *ar-* + *-mjən* → *arimjən*; *pur* + *-iro* → *puriro*).

## 5 Conclusion

Based on the phonology of Middle Korean, the possibility that the syllable final /r/ was pronounced as a flap, at some point before Middle Korean, was proposed. This proposal is by no means new, but I put various pieces of evidence together by reinterpreting the data. The ambiguous acoustic signal inherent in flap sounds leads to the reanalysis of /r/ final stems as vowel-final stems. /r/-final stems act as though they were vowel-final stems, for the morpho-phonology of the verbal stems reflects the phonology of this period.

By pointing out the weaknesses of the homophony blocking account, the explanation for /ri/-final stems, which is the forte of the account, is necessary. I do not yet have a specific opinion on this issue, but given the fact that the inflected form reflects the phonology of the past, we can think of the possibility that there was a consonant in between the consonant and the vowel of the second syllable.

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<sup>7</sup> Ramsey (1978) proposed that /i/ of *i*-suffixes should be treated as belonging to the stem for some verbal stems through considering the tonal features. The proponents of multiple UR hypothesis for irregular verbs (Choi 1985, among others) also set a stem form before /i/-suffixed form as one of the underlying representation, as well as before C-suffixed form.

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