On the alternation of the modesty suffix in Middle Korean

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Ahn, Sang-Cheol, and Jung-Kil Han. 2010. On the alternation of the modesty suffix in Middle Korean. *Studies in Phonetics, Phonology and Morphology* 16.1. 107-122. This paper reanalyzes the phonological alternation of the 15th century Middle Korean pre-final modesty suffix showing the various alternating forms, -*sɔp-,-zɔp-, -cɔp-,-sɔβ-, -zɔβ-, -cɔβ-,-sɔm-, -zɔm-, -cɔm-, s'ɔβ-, -z'ɔβ-, -c'ɔβ-*, etc. As this suffix is no longer used in Modern Korean, there have been very few accounts on the phonological variations, compared with those on syntactic characteristics (H.-K. Kim 1947, Heo 1953, B.-H. Ahn 1961, C.-W. Park 1996, Y.-P. Kim 2002, etc.). There remains, however, a controversy over the underlying representation of this suffix in that those two segments /ɔ/ and /β/ are extinct in the Modern Korean phonemic inventory. Based on this historical background, this paper attempts to analyze the phonological nature of this suffix from a new perspective. To this end, we propose an underspecified feature geometric representation of this pre-final suffix, reflecting the ambivalence of the initial and the final consonants. And this proposal for the underspecified representation is supported by various alternating forms. Finally, we conclude this paper by illustrating how the Middle Korean form has been changed to the Early Modern Korean variants in terms of the constraint ranking relationship and the change of hierarchy. Here we employ the combination tableau format (McCarthy 2008) in order to show the clear ranking relationship among the constraints. **(Kyung Hee University and Korea National University of Education)**

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1. Introduction

Korean morphology allows various types of pre-final suffixes that occur between a stem and a (final) suffix. Moreover, two separate morphemes are used to express the speaker's modesty and his/her respect to the referent. As shown in the following table, the pre-final "modesty" suffix expresses the speaker's modesty, while the honorific marker is employed for the speaker's respect to the referent.[1]

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[1] The distributional order of the pre-final suffixes is honorific > tense > modesty, as shown in the following illustrations. (Hon=honorific, SE=sentence ending, Inf=inference, Mod=modesty, Ref=retrospective)

  1) honorific: -(ɨ)si-   e.g., ka-si-ta 'go-Hon-SE'
  2) past tense: -(ɨ)si-əss-   e.g., ka-si- əss-ta 'go-Hon-Past-SE'
  3) inference: -(ɨ)si-əss-kess-   e.g., ka-si-əss-kess-ta 'go-Hon-Past-Inf-SE'
  4) modesty: -(ɨ)si-əss-kess-sao-   e.g., ka-si-əss-kess-sao-ita 'go-Hon-Past-Inf-Mod-SE'

(1) Pre-final suffixes in Modern Korean

Honorific	(for referent)	-si-		
Modesty	(for speaker)	-op-, -o-, -sap-, -saop-,-sao-, -cap-, -caop-, -cao-		
Tense	Past	-ass-/-əss-, əssəss-, -tə-		
	Present	-nɨn-		
	Future	-kess- (or intention/possibility)		
	Retrospective	-tə-		

Here we also note that the modesty suffix allows various alternative forms, depending on the surrounding phonological environment. Speakers, however, used alternative forms even in the Middle Korean period, such as *sɔlp-(ta)* 'to tell (respected person)' or *poy-(ta)* 'to meet (a respected person)'.[2] As a consequence, the use of the modesty suffix is somewhat archaic in Modern Korean.[3]

These alternation forms are, however, somewhat different from those of the 15th century Middle Korean as various phonological changes affected the alternation pattern by excluding the now extinct phonemes, *ɔ, *z, and *β-. That is, the modesty suffix was realized in various forms in Middle Korean, showing a somewhat complicated bilateral alternation.

(2) Bilateral alternation in Middle Korean
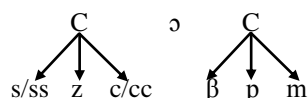
As a consequence, the following allomorphic variants are observed in the literature. (Here we omit the tense (or geminate) morpheme-initial alternants (i.e., s', c'), which occurred after a stem-final obstruent.)

(3) Allomorphic variants:
-sɔp-, -zɔp-, -cɔp-, -sɔβ-, -zɔβ-, -cɔβ-, -sɔm-, -zɔm-, -cɔm-, etc.

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5) retrospective: -(ɨ)si-əss-kess-saop-tə-   e.g., ka-si-əss-kess-saop-tə-la
                                         'go-Hon-Past-Inf-Mod-Ref-SE'
                                         '(he-honorific) must have gone'

[2] sɔlp-(ta): mal.ssɔ.mɨl. (武王(mu.wang)skɨy) sɔl.βɔ.li ha.tɔy   (*Yong.bi.eo.cheon.ga* 13)
      王(wang)skɨy) kɨ sku.mɨl sɔl.βɔ.si.nɔl   (*Weol.in.seok.bo* 2:33)

[3] It is called a "respect morpheme for the referent" and it is replaced with new expressions in Modern Korean.

default	po- 'to see'	cu- 'to give'	mal-ha- 'to say'
modesty	poep-'to see (the referent)'	tɨli-'to give (to the referent)'	yəccup-'to say (to the referent)'

That is, *po-* 'to see', *cu-* 'to give', *mal-ha-* 'to say' have the corresponding honorific forms.

The examples in (4) and (5) show that the realization of the suffix-initial consonant (i.e., *s~z~c*) was determined by the preceding consonant, while the final obstruent (i.e., *p~β*) was determined by the following segment.

(4) a. Alternation of the initial consonant: [s]~[z]~[c]
      sɔp-   After /k, p, s, h/ → -*s*- occurred   {k, p, s, h} + s
      zɔp-   After a vowel or /n, m, l/ → -*z*- occurred {V, n, m, l} + z
      cɔp-   After /t, c, cʰ/ → -*c*- occurred   {t, c, cʰ} + c
    b. Alternation of the final consonant: [p]~[β]
      sɔp-, zɔp-, cɔp-   Before a consonant → -*p*- occurred   p + C
      sɔm-, zɔm-, cɔm- Before a nasal → -*m*- occurred   m + N
      sɔβ-, zɔβ-, cɔβ- Before a vowel → -*β*- occurred   β + V

(5) Examples showing the final *p~β* alternation
    a. *sɔp- ~ sɔβ-*   e.g., top.sɔp.ko ~ top. sɔ.βɔl.s'i.la 'help (someone)'
    b. *zɔp- ~ zɔβ-*   e.g., an.zɔp.ko ~ an.zɔ.βa   'know'
    c. *cɔp- ~ cɔβ-*   e.g., tɔt.cɔp.no.ni ~ tɔt.cɔ.βɔl   'hear'

2. Controversy over the segmental representation

The various alternations of the modesty suffix have not been accounted for in terms of the underlying representation, as the major concern of earlier studies was the textual distribution, rather than the phonological derivation. Therefore, several traditional studies (B.-H. Ahn 1961, K.-M. Lee 1972, 1978, etc.) simply employ /sɔβ/ as the basic form in the explanation of the allomorphic distribution in that the historical origin of this suffix was /sɔlβ/ 'to say (to an honored person),白)'. K.-M. Lee (1972), for example, shows the possibility of positing /β/ as an underlying segment, as it alternated with [p] depending on the phonological context, which can be compared with /cap/ 'to hold, arrest,' which had no alternation even intervocalically (K.-M. Lee 1972: 43).

  Heo (1964, 1975), however, proposes the underlying form /zɔ.β/ having two fricatives. (The dot indicates a syllable boundary in /zɔ.β/.) Heo argues that, if /s/ is the underlying segment, it would be difficult to explain why it showed up as [z] after /n, m, l/ or a vowel, since there are numerous cases which do not show this type of reduction. (By positing /z/, as the underlying form, however, we can easily explain the /z/ → [s] change as devoicing and /z/ → [c] after /t/ as a consequence of coronal assimilation for non-continuancy. He also shows a similar argument for the final /β/ → *p* change before a consonant since /β/ could not occur before a consonant. More specifically, he posits the hetero-syllabic /zɔ.β/, as /β/ could be only syllable initially and the /β/ → *w* change was obligatory before a vowel.[4]

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[4] The /β/ to [w] change was completed by 1460, producing /sɔ.w/, /zɔ.w/, and /cɔ.w/ as shown in the following examples (Heo 1975: 695-696).
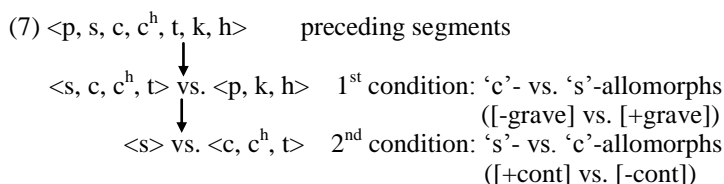
On the other hand, Ko (1997) explicitly rejects the traditional view for /sɔβ/, on the ground that it would be ad hoc to posit the now extinct phoneme /β/ in the underlying representation. He further claims that if the other extinct labial fricative /β/ is posited at the underlying representation, there is no reason not to include /z/ in the underlying representation for consistency with the final /β/. Then, the underlying form would end up with /zɔβ/ as proposed in Heo (1964, 1975). He thus posits /sɔp/ as the underlying representation from a synchronic point of view.

J.-H. Lee (1999: 374), however, argues against Ko's proposal for /sɔp/. Instead, he suggests the three variants -sɔβ-, -zɔβ-, -cɔβ- be listed in the lexicon. Nevertheless, he suggests /sɔβ/ as the best candidate if a single underlying form is to be listed in the lexicon, based on the historical origin /sɔlβ/ 'to report' (白).

Due to the unstable status of both (now extinct) fricatives, three possible candidates have emerged in the previous studies.

(6) Possible underlying forms: /sɔβ/, /sɔp/, /zɔβ/

More recently, employing the [continuant] and [grave] features (Jacobson & Halle 1956), Y.-P. Kim (2002) accounts for the allomorphic variations in terms of a sequential application of a couple of constraints.

(7) <p, s, c, c^h, t, k, h>   preceding segments
     $\downarrow$
  <s, c, c^h, t> vs. <p, k, h>   1st condition: 'c'- vs. 's'-allomorphs
                                      ([-grave] vs. [+grave])
          $\downarrow$
          <s> vs. <c, c^h, t>   2nd condition: 's'- vs. 'c'-allomorphs
                                      ([+cont] vs. [-cont])

There is no explicit explanation in Y.-P. Kim as to how the surface variants could be derived from the underlying form of the suffix. Without much discussion on the underlying form, he simply assumes *sɔβ* as the basic form in that this morpheme was diachronically derived from the verb *sɔlβ* 'to report (白)'. Rather, he focuses on the surface variants such as *s'ɔm-* or *c'ɔp-*, i.e., the sequential consequences of the nasal assimilation or post-obstruent tensification.

We, however, observe several possible problems regarding this account on the pre-final suffix. First, we may question whether we can posit an alternative form as the underlying form, such as /sap/, /sɔp/, zɔp/, or even /zɔβ/. Especially, as claimed in Heo (1963, 1975), the last candidate /zɔβ/ looks plausible when we consider that the underlying suffix-final segment

a.   top.sɔ.wa (*Neung.eom* 6: 25), cos.sɔ.wa (*Neung.eom* 5: 6),
     nip.sɔ.o.tɔy (< nip.sɔ. βo.tɔy) (*Beop.hwa* 3: 165),
b.   tay.tap hɔ.zɔ.o.tɔy   (*Neung.eom*   1:50)
c.   mit.cɔ.wa (*Neung.eom* 5: 80), mut.cɔ.on.tay (*Neung.eom* 1:3), etc.

is the final voiced fricative, which is now extinct in Modern Korean. Second, considering the fact that /β/ appeared in the literature less than 20 years, the instability of the bilabial fricative would make /sɔβ/ subject to controversy. Third, Kim's sequential account would not explain why /s/ occurred after the [-grave] /s/, while /c/ was preferred after other [-grave] segments /t, c, cʰ/. Fourth, we may also ask why the final /s/ did not become /c/ after a stem-final /p/ since the non-continuancy could have been shared in the *p + c* sequence.

(8)   No feature sharing: p + s (occurred)
       Non-continuancy shared: *p + c (not occurred)

   In addition to these possible problems, the /sɔβ/ form would make use of numerous rules to account for the various surface alternations.

(9)   a. Affrication: s → c
       b. Voicing: s → z
       c. Occlusion: β → p
       d. Nasalization: β/p → m
       e. Tensification: s → ss, s →(c →) cc

3. Ambivalence in a feature-geometric account

Considering these shortcomings of the earlier studies, this paper proposes the feature-geometric representation of the suffix as in (10). Here we observe that the initial consonant is specified as [+cont] since the continuancy remained intact in the *s~z~c* alternation. That is, all the alternant segments, i.e., the fricatives /s, z/ and the affricate /c/, share the continuancy in articulation. On the contrary, however, the final consonant is underspecified for the continuancy, which varied in the *p~β* alternation.[5]

(10)   R   R   R
         |\[+cont] | |
        C-pl   V-pl   C-pl
         | : |
        Cor   Lab
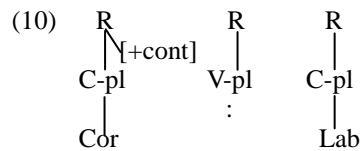
3.1. Alternation of the initial segment

Based on the ambivalent representation in (10), we will now discuss various feature agreement/assimilatory relations between the suffix-initial/final consonant and the preceding/following segment. First of all, we argue that the allomorphic distribution of the suffix-initial segment was governed by

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[5] Refer to Holt (2002) and Ahn (2008) for the earlier ambivalent feature-geometric accounts.

a certain principle requiring that the [continuant] property of the pre-final suffix be identical to that of the preceding stem-final coronal stop /t/. The figure (11) shows that the suffix-initial [c] and the preceding consonant share both coronality and and noncontinuancy.

(11) Sharing coronal noncontinuancy: t + c

        stop [t]   affricate [c]
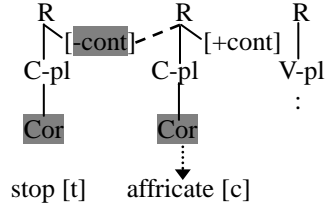
    e.g., tɔt-cɔp-noni 'as he runs',
          tɨt-cɔp-kəy 'in order to hear', (*Seok.bo.sang.jeol* 13:17)
          kut-cɔβ-ani   'be firm'   (*Yong.bi.eo.cheon.ga* 66)
          pat-cɔp-təla 'he receives'   (*Weol.in.seok.bo* 21:203)

Note that the usage of the initial affricate [c] was unique in that it could occur only after /t/. We thus need to observe that the affricate /c/ and the stop /t/ share both [-continuant] and [+coronal] properties.
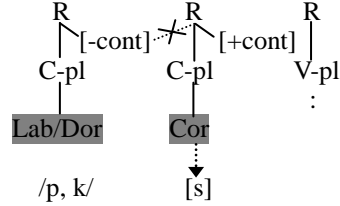
This principle of sharing non-continuancy can be further supported by the following data showing that, in the early period, [c] occurred before a stem-final /c/ as well as /t/ (Heo 1975: 692) as both /t/ and /c/ have [-cont] and [+coronal] properties.[6]

(12) mac-cɔp- 'to meet' > ma.ccɔp.tə.ni (*Weol.in.seok.bo* 21:203)
       coc^h-cɔp- 'to follow' > coc^h.cɔp.ko.cyə (*Yong.bi.eo.cheon.ga* 78)
                         ~ cos.cɔp.ti (*Beop.hwa.gyeong.eon.hae* 3:125)

As the principle of sharing coronal non-continuancy plays the major role, [s] was used as the suffix-initial segment when preceded by other non-coronal stops /p, k/.

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[6] Furthermore, as mentioned in Y.-P. Kim (2002), due to the realization of the initial *c*-occurred after the *t, c, c^h* segments, these (non-continuant) coronal consonants should be grouped as a natural class. We can thus posit a historical account for the divergence of the palatal affricate in a later Middle Korean period in that the affricate *c* was pronounced as an alveolar in the early period of Middle Korean, but it was moved to the palato-alveolar region in a later period, a fact that can be verified by the textual data showing diachronic/dialectal development of the palatalization in Middle Korean (Ahn & Cho 2004).
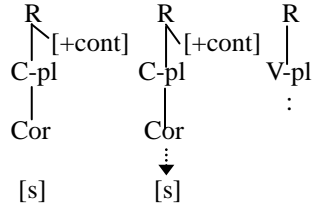
(13) Realization of [s] after non-coronal stops

$$
\begin{array}{ccc}
\text{R} & \text{R} & \text{R} \\
\text{[-cont]} & \text{[+cont]} & \\
\text{C-pl} & \text{C-pl} & \text{V-pl} \\
& & : \\
\boxed{\text{Lab/Dor}} & \boxed{\text{Cor}} & \\
& \downarrow & \\
\text{/p, k/} & \text{[s]} &
\end{array}
$$

e.g., nip-sɔp-ko 'wear (clothes)' (*Weol.in.seok.bo* 2: 72)
       mak-sɔp-kənɨl 'block' (*Weol.in.cheon.gang.ji.gok sang* 100)

The strong tendency for sharing coronal non-continunacy applies only if the suffix is preceded by a stop (or an affricate). It does not, therefore, play any role if the preceding stem-final segment is a fricative /s, h/ being specified as [+cont].

(14) Realization of the default [s] after a fricative /s, h/

$$
\begin{array}{ccc}
\text{R} & \text{R} & \text{R} \\
\text{[+cont]} & \text{[+cont]} & \\
\text{C-pl} & \text{C-pl} & \text{V-pl} \\
& & : \\
\text{Cor} & \text{Cor} & \\
& \downarrow & \\
\text{[s]} & \text{[s]} &
\end{array}
$$

e.g., cos-sɔp-ko 'give a deep bow' (*Weol.in.seok.bo* 2: 51)
      (威名(uy.myəŋ.ɨl) cəh-sɔ.β-a 'fear of the renown'
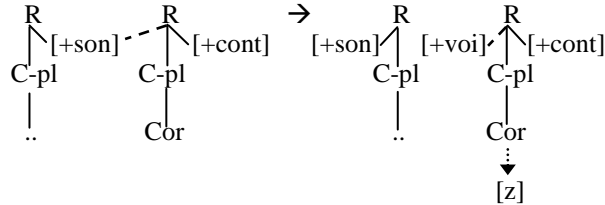   (*Yong.bi.eo.cheon.ga* 75)
      noh-sɔβ- 'put' (> nossɔp-ko (*Seok.bo.sang.jeol* 9:22))

Note that the suffix-initial segment is already specified as [+cont], spreading the [+cont] property of the preceding segment would be redundant. (Moreover, /h/ lacks the coronal specification.)
On the other hand, the suffix initial segment was realized as <z> if it was preceded by a sonorant or a vowel.

(15) [z] after a sononant

$$
\begin{array}{cccc}
\text{R} & \text{R} & \rightarrow & \text{R} & \text{R} \\
\text{[+son]} & \text{[+cont]} & & \text{[+son]} \quad \text{[+voi]} & \text{[+cont]} \\
\text{C-pl} & \text{C-pl} & & \text{C-pl} & \text{C-pl} \\
.. & \text{Cor} & & .. & \text{Cor} \\
& & & & \downarrow \\
& & & & \text{[z]}
\end{array}
$$

Observe that the spreading of the sonorant (or vocoid) property to the [+cont] suffix-initial consonant generates a voiced fricative since a fricative cannot be combined with a sonorant property of a sonorant (or a nasal) consonant or a vocoid property of a vowel. The following examples show the realization of the suffix-initial [s] (Heo 1975: 692-693, Yoo 1964).[7]
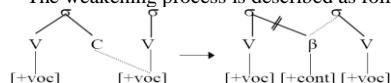
(16) po-<u>z</u>ɔp-kənɨl 'as he sees' (*Weol.in.seok.bo* 18:21)
       a-<u>z</u>ɔp-kəy 'in order to know' (*Weol.in.seok.bo* 10:85)
       (han son-ɨl) tɨ-<u>z</u>ɔp-kəna 'he lifts one hand' (*Seok.bo.sang.jeol* 13:53)
       po-<u>z</u>ɔ.β-oni 'to see' (*Seok.bo.sang.jeol* 13: 27)
       an-<u>z</u>ɔ.β-a 'hug' (*Weol.in.seok.bo* 2:43),
       an-zɔp-ko ul.myə (*Sam.gang.chung* 18)
       sam-<u>z</u>ɔ.βo.li.la 'adopt' (*Weol.in.seok.bo* 8:79)

These examples clearly show that this weakening process would not be explained without positing [+cont] on the suffix-initial segment underlyingly. As we have observed so far, the various allomorphic alternation of the suffix-initial segment can be properly explained by specifying the continuancy and coronality underlyingly, while underspecifying the voice property.

On the other hand, the alternation of the suffix-final segment is more straightforward. (11) shows the passive weakening which changes the suffix-final consonant /p/ to [β] due to the high sonority of the neighboring vowels (Ahn 2006).[8] (Then the bilabial fricative was further weakened to an approximant [w] or became extinct in a later period (W.-J. Kim 1996, G.-A. Kim 1997, J.-P. Kim 2001, Ahn 2006, etc.))

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[7] We can, however, find some exceptions such as "can.spun tɨl.ki.lɔl (禮)yəy.lɨl sam.**s**ɔp.say" (*Cheop.hae.sin.eo* 3:9) in which [s] occurred even after a stem-final nasal (Yoo 1964: 439). The purpose of this Japanese textbook was to teach Japanese words to Korean interpreters. And as it was published in 1676, it shows that /z/ was replaced by /s/ in the Middle Korean history.

[8] The weakening process is described as follows.

(17)

```
        σ           σ        σ                σ          σ         σ
       / \          |        |                ‖ - - -   / \        |
      R   R         R    →   R          R          R
      |   |         |        |          |          |
     Voc C-pl      Voc      Voc        C-pl        Voc
      |   |  ⌐......|        |          |           |
    V-pl Lab      V-pl      V-pl       Voc         V-pl
                                        |
                                       V-pl
                                        |
                                       Lab
                                       [w]        [i]
```

e.g.,   an.zɔp.ko ~ an.zɔ.βa 'sit',
         -ti.βi > -ti.wi 'although'

We here observe the resyllabification for the surface realization of [β] which could occur only syllable-initially. Moreover, the given examples indicate that the plosive [p] could occur before a consonant, while the pre-vocalic segment underwent weakening, producing [β] in a syllable-initial position.

On the other hand, the textual data show various cases of tensing, which were represented orthographically.

(18) a.   놓(置)- + -sɔp-   →   (nos.sɔp-)   →   no.s'ɔp-   'locate'
     b.   좃(稽)- + -sɔp-   →   cos.sɔp-   →   co.s'ɔp-   'consider'
     c.   받(奉)- + -cɔp-   →   pat.cɔp-   →   pa.c'ɔp-   'uphold'
     d.   맞(迎)- + -cɔp-   →   mac.cɔp-   →   ma.c'ɔp-   'greet'
     e.   좇(隨)- + -cɔp-   →   coc^h.cɔp-   →   co.c'ɔp-   'follow'
                                                              (cf. cot.c'ɔp)
                                               (*Weol.in.seok.bo* 11:107a)

In order to account for this, we can employ the geminate hypothesis (Ahn & Iverson 2004), by which the realization of V+*s'ɔp/c'ɔp* after {h, s} is easily described as gemination.

(19) Gemination

```
        C  +  C
        |  ⹃=⹄ |
        h     s    →    ss (=[s'])
```

Note that, according to the geminate hypothesis, Korean tense consonants are represented as geminates in that the closure/frication duration of tense consonants is much longer than those of the lax and aspirated ones (by about 1/3, according to medial measurements reported by H.-K. Ahn (1999: 30) [207 ms, 145 and 146 ms]). The tense series also differs from the others by not undergoing medial lenition, while the plain

and aspirated series experience substantial reduction in VOT lag in the same environments.

3.2. Alternation of the final segment

Unlike the initial continuancy specification, the underspecification of this feature for the final segment can be supported by the *p ~ β~ m* alternation. Note that the final segment was realized (phonetically and orthographically) as [m] before a nasal consonant. And the following figure shows the realization of the nasal [m] by simple linking of the [+nasal] feature. If the final segment were specified as [+cont], it is not possible to get nasalization since [+cont] cannot be combined with [+nas].

(20)   …   R   R
           ┌ ̄ ̄ ̄ ̄-[nas]┐
           C-pl   C-pl
           │
           Lab
           ∅
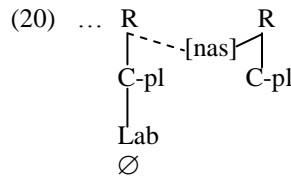
As mentioned already, numerous previous studies proposed the underlying presentation as /sɔβ/. Such a proposal, however, would face difficulty in explaining why the [+cont] segment underwent nasalization, in spite of the following general constraint.

(21)   …   R   R
             ┌ ✕ -[nas]┐
             C-pl   C-pl
             │
             Lab
             │
             [+cont]
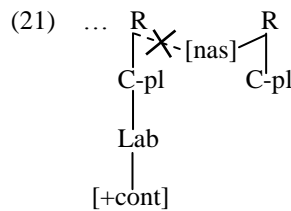
As we have discussed so far, the ambivalent underlying representation of the pre-final suffix could better describe the various allomorphic distributions. Notably, the [+cont] specification of the initial segment and the underspecification of the final segment play crucial roles in the alternation. Moreover, along with the specification of the underlying continuancy, the principle of sharing coronal non-continuancy plays a crucial role in the alternation of the initial segment.

4. Further developments

The Middle Korean modesty suffix was originated from the Old Korean /sɔlp/, which was used as a verb or as a pre-final suffix (M.-R. Kim 2004:

103). (Due to the lack of the Korean orthography in Old Korean, however, the following transliteration is taken from the Old Korean texts written in *Gu.gyəl* employing Chinese scripts.)

(22) a. po.sɔlp.nɔ.syəy   'please take a look' (*Hwa.eom.gyeong* 8:4)
      b. cʰal.cʰal.ma.ta.mo.li.<u>sɔlp</u>.on '(humbly) placed in temples'[9]
                                                    (*Ye.gyeong.je.bul.ga*)

   The various alternating forms of the Middle Korean modesty suffix were, therefore, descended from the Old Korean /salp/, whereby the sonority of the coda /l/ caused the [p]~[β] alternation. The Middle Korean modesty suffix, however, lost this alternation later due to the extinction of /β/ in Later Middle Korean and thus showed the alternants, -*sɔp*-, -*cɔp*-, and -*ɔp*- before the Early Modern Korean period (M.-R. Kim 2004: 269).

(23) mək.sɔp.na.i.ta   'eat' (*Cheop.hae.sin.eo* 3-6)
     hɔ.ɔp.si.nɔn.ko   'do' (*Gey.chuk.il.gi*)
     hɔ.si.ɔp.nɔn.ko   'do' (*Cheop.hae.sin.eo* 9-8)

   Finally, the modesty suffix underwent further changes and showed the following alternations in Early Modern Korean.

(24) a. After a vowel: *ɔp-, ɔo-, o-*
      b. After /t, c/: *cɔo-, cɔp-*
      c. After other consonants: *sɔo-, sɔp-, sɔop-*

   As shown below, these subsequent changes can be easily dealt with in terms of a series of diachronic weakening processes, i.e., $s > z > \varnothing$, $lp > l\beta > p/\beta > w$ (K.-M. Lee 1972). Moreover, employing the Optimality Theory (McCarthy & Prince 1995, McCarthy 2008), these weakening processes are easily accounted for in terms of the role of relevant constraints and their ranking relationships.[10] To this end, we first postulate the following markedness constraints.

(25) *z/β   Extinct phonemes may not be allowed.
     *V%[-voice] A voiceless suffix consonant may not be attached to a
                  vowel (in modesty suffixation).

   The first constraint prohibits those extinct phonemes, such as /z, β/, in surface realization. The second constraint looks somewhat ad hoc in that its

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[9] 利利每如邀里白乎隱

[10] As for the chronological sequence of the changes, we can propose the following hierarchy in that /β/ was used in the Late Middle Korean literature (*Hun.min.jeong.eum* or *Yong.bi.eo.cheon.ga*) less than 20 years, whereas the usage of /ɔ/ lasted until the early Modern Korean period (and even in Modern Jeju dialect). *β >> *z >> *ɔ

usage is limited to modesty suffixation. As will be shown later, however, this constraint is very powerful due to its bidirectional usage, i.e., mirror image application. That is, this constraint accounts for the disappearance of both suffix-initial and suffix-final consonants in modesty suffixation.

These markedness constraints dominate the usual faithfulness constraints in constraint ranking, filtering out the incorrect candidates. For the detailed description, we employ the new "combination tableau" format utilizing both violation marks and the Winner(W)/Loser(L) markings. As shown in Brasoveanu & Prince (2005) and McCarthy (2008), the comparative or combination format is best for ranking problems. Note that the winner is already known and focus of the evaluation is to show the ranking relations. The following tableau shows how the optimal candidate for (26d) can be obtained from a constraint hierarchy.[11]

(26)

V+ C		*Z	*V %[-VOICE]	IDENT[CONT]	MAX
a.	V + z	*W			L
b.	V + s		*W		L
c.	V + n			*W	L
☞d.	V + ∅				*

The current analysis in (26) employs a "combination tableau" which includes information about violations and the Prince's W/L annotations of the comparative tableau. The W and L annotations, therefore, indicate those constraints that favor the winner or the losers. Moreover, the W and L marks are limited to the loser rows since they indicate how a loser compares with the winner regarding each constraint. Due to the possible complexity of evaluation in the comparative format, however, we use the combination tableau as suggested in McCarthy (2008). As a consequence, with the two markedness constraints, we can effectively demonstrate how the winner beats the competing loser candidates.

On the other hand, we need to invoke the already mentioned tendency for "share coronal noncontinuancy" for the appearance of the initial [c] after /t, c/. Thus, we formulate the following constraint.

(27) SHARE[COR/cont]   Two adjacent coronal obstruents may share (non)continuancy (in modesty suffixation).

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[11] We may use a traditional violation tableau as shown below.

V+ C		*Z	*V %[-VOICE]	IDENT[CONT]	MAX
a.	V + z	*!			
b.	V + s		*!		
c.	V + n			*!	
☞d.	V + ∅				*

As shown below, we observe the major role of this constraint in Early Modern Korean as well as in Middle Korean. (Here we employ an additional constraint, i.e., OCP for voicing, discouraging two adjacent [-voice] segments).

(28)

t + C		*z	SHARE[COR/cont]	ID[cont]	OCP[voice]
☞a.	t + c				*
b.	t + z	*W	*W		L
c.	t + s		*W		L
d.	t + t			*W	

Here we observe that the SHARE constraint takes a crucial role that eliminates the two candidates (28b) and (28c). Moreover, the suffix-initial segment C includes [+voice], the last candidate (d) violates the ID[cont] constraint. The winner, however, does not violate this constraint since the affricate /c/ has the [-cont][+cont] specification.

The two markedness constraints shown earlier in (25) also play the most important role in the deletion or realization of the suffix-final consonant, i.e., $\varnothing$ or [p], depending on the context. For example, the following tableau shows how the suffix-final segment was deleted if it is followed by a vowel.

(29)

C + V		*β	*V%[-voice]	IDENT[SON]	MAX
a.	β + V	*W			L
b.	p + V		*W		L
c.	w + V			*W	L
☞d.	$\varnothing$ + V				*

As mentioned above, the deletion of the suffix-final segment is accounted for by the role of the two markedness constraints, especially the mirror image application of the second constraint prohibiting possible adjacency of a vowel and a voiceless segment (in Middle Korean as well as Early Modern Korean). If the suffix is not adjacent to a vowel, therefore, [p] would be selected as the optimal output for the final segment.

5. Concluding summary

This paper reanalyzes the phonological alternation of the 15th century Middle Korean pre-final "modesty" suffix showing the various alternating forms. To this end, we briefly sketched the earlier studies on this issue (H.-K. Kim 1947, Heo 1953, B.-H. Ahn 1961, C.-W. Park 1996, Y.-P. Kim 2002, etc.). Based on this introductory description, we then discuss the controversy over the underlying representation of this suffix and then analyze the phonological nature of this suffix from a new perspective. Specifically, we propose an underspecified feature-geometric representation of the pre-final modesty suffix, reflecting the ambivalence of the initial and

the final consonants (Ahn 2008). And we showed various supporting arguments for this underspecified representation. Finally, employing the combination tableau format (McCarthy 2008), we illustrated how the Middle Korean form has been changed to the Early Modern Korean variants in terms of the constraint ranking relationship and the change of hierarchy. To be specific, we first showed the important role of the SHARE[COR/cont] constraint, representing the Middle Korean tendency for sharing coronal noncontinuancy between a stem-final segment and the suffix-initial consonant. Here we observed that the Middle Korean constraint still worked for the later alternations in Early Modern Korean. Moreover, we observed how the two markedness constraints work to account for the various alternations. Especially, the given tableaux showed the effectiveness of the mirror image application of the constraint prohibiting possible adjacency of a vowel and a voiceless segment. Furthermore, we employed the new "combination tableau" format, as ranking problems are better described by this format, while the traditional violation tableaux are efficient for selection problems (Brasoveanu & Prince 2005, McCarthy 2008).

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