

# The Korean Copula and Palatalization

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The Korean palatalization of dental stops has been claimed by Ahn (1985) to be lexical in the model of Lexical Phonology insofar as it applies only between word boundaries and it obeys strict cyclicity. However, it turns out that palatalization also applies before the copula /i/. Assuming that the palatalization rule is a word internal sandhi rule applying only within the domain of the phonological word, the copula /i/ should be considered an affix to condition the lexical palatalization rule. This paper discusses the morphological status of the copula and provides substantial evidence for treating it as a clitic as opposed to an affix or an independent word on the basis of tests developed by Zwicky and Pullum (1983) and Zwicky (1985). It also discusses other rules referring to the phonological word as their domain and defines the phonological word in Korean as a morphological word plus either clitics or affixes.

## 1. Introduction

The Korean palatalization rule of dental stops has been claimed by Ahn (1985) to be lexical in the model of Lexical Phonology (henceforth LP) since it is limited to lexically derived environments. However, it turns out that palatalization has to apply before the copula /i/. Assuming that the palatalization rule is a word internal sandhi rule applying only within the domain of the phonological word, the copula /i/ should be an affix phonologically in order to condition the lexical palatalization rule.

In this paper, I provide arguments for the clitic status of the Korean copula, a vehement controversy over which has raged for many years among Korean linguists. Then I will explore how cliticization has an effect on the lexical rules in the framework of LP.

## 2. The Domain of Palatalization

In Korean, /t/ and /th/ become palatal by assimilation to the following high palatal segment /i/ or /y/.<sup>1</sup> The following forms show this phenomenon:<sup>2</sup>

(1) /kath-i/	[kachi]	'together'
same der. affix		
/kut-hi-ta/	[kuchida]	'harden'
hard trans. affix		
/kut-i/	[kuji]	'firmly'
hard der. affix		
/path-i/	[pachi]	'field(NOM)'
field NOM		

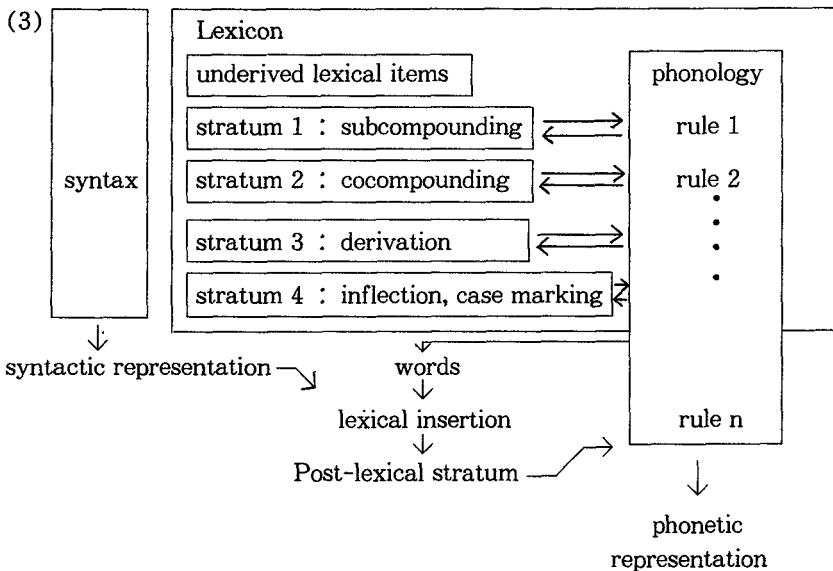
This rule has been claimed to be lexical since it applies only within the word boundary and obeys strict cyclicity (Ahn, 1985: 98). The examples in (2a-b) illustrate these points:

(2) a. i . /k'th # # hyuil/	[k'thyuil]	'last holiday'
an end                    holiday		
ii . /h e t # # hilchæk/	[həthilchæk]	'fruitless reproach'
fruitless                reproach		
iii. /soth # # i-ta/	[sodida]	'hold a pot on the head'
pot hold something on the head		
b. i . /thi/	[thi]	'dust'
ii . /mati/	[madi]	'knot'
iii. /titi/	[tidi]	'to step on'

Before proceeding, I must point out that I assume the Korean lexical phonology framework laid out in Ahn (1985). He develops the following framework to account for Korean:

<sup>1</sup> In this paper, /Ch/, /ch/, and /ng/ represents /C̚/, /č/, and /ŋ/, respectively, and /C/ stands for /p, t, k/.

<sup>2</sup> Lexical palatalization applies even when /h/ intervenes between the target and the determinant.



The basic concept of LP is that the lexicon consists of several ordered levels, or strata, which are the domains of certain phonological rules as well as the domains of morphological rules. For details, see Mohanan (1982) and Kiparsky (1982).

I also assume that the domain of the palatalization rule is the phonological word. Now questions arise as to whether the phonological word is isomorphic to the morpho-syntactic word, and if not, how to define it. In this paper I next try to answer these questions.

Of crucial interest to us are the forms in (4) exhibiting palatalization.

- (4) a. path i-ta. [pachida]  
 field COP DECL 'This is a field.'  
 b. soth i-ta. [sochida]  
 pot COP DECL 'This is a pot.'

If the copula /i/ is a syntactic word, it should be introduced from syntax by an ID rule like (5):

- (5) VP → NP, V [112]

According to Kiparsky (1982), the examples in (4), then, could be said to show the application of the palatalization rule postlexically since

palatalization applies between words. There are two options for dealing with this situation: one is to permit the application of palatalization both lexically and postlexically only before the copula /i/ (cf. 2a.iii and 4b). The other is to reconsider the phonological status of the copula. In other words, if the copula /i/ combines with the preceding elements morpho-syntactically and the resulting output constitutes a phonological word, then palatalization can be said to be purely lexical, applying in the domain of the phonological word. Before giving detailed arguments showing that the cases of palatalization before the copula as shown in (4) are indeed lexical, I give a discussion of the morphological status of the copula, which may give a clue to an answer to the question concerned, after which I will return to the question of how palatalization before the copula is handled.

### 3. The Morphological Status of the Korean Copula

Korean linguists are divided into two groups with respect to the dispute over the copula in Korean. One of them denies the existence of the copula and treats it as the predicative case particle because a noun phrase in Korean must always be overtly marked by a particle at some stage of derivation and the copula always occurs immediately after an NP (Jung: 1959). The other group takes the copula as it is and argues that a Korean grammar without the copula is inconsistent as well as inadequate (Song: 1988, Choi: 1963).

In this section, I show that the Korean copula is likely to be a bound word rather than an affix or an independent word on the basis of Zwicky & Pullum's (1983) and Zwicky's (1985) tests. Notice that Zwicky (1985: 289) claims that, "ceteris paribus, an item whose standing is unclear is most likely to be an independent word, next most likely to be an inflectional affix, and least likely to be a clitic." Therefore, substantial evidence is needed to argue for the clitic status of a grammatical unit in addition to evidence against treating the copula as an independent word as well as an affix. Next I will set the stage for this discussion of the morphological status of the copula by discussing the latter.

### 3.1. The Argument against Treating the Copula as an Affix

Here I argue that the copula /i/ is neither an inflectional affix nor a derivational affix. First, I reject the possibility of treating the copula as an inflectional affix by considering the following examples:

- (6) a. John - i mək - ta. ‘John eats.’  
     John NOM eat DECL  
     John - i mək - əss - ta. ‘John ate.’  
         PAST DECL  
     John - i mək - kess - ta. ‘John will eat.’  
         FUTURE DECL  
     b. John i - ta. ‘It is John.’  
     John COP DECL  
     John i - əss - ta. ‘It was John.’  
         PAST DECL  
     John i - kess - ta. ‘It will be John.’  
         FUTURE DECL

If the copula /i/ is an inflectional affix attaching to a noun, we should answer a few questions: why does only this affix have different forms with respect to tense which happen to be the same as verbal inflections morphologically as well as phonologically unlike other affixes attaching to nouns? Is it necessary to introduce a new PS rule like S→NP NP for normal sentences in (7)?

- (7) John - i haksæng i - ta.  
     John NOM student COP DECL ‘John is a student.’  
     Mary - ka sənsængnim i - ta.  
     Mary NOM teacher COP DECL ‘Mary is a teacher’

Lack of convincing answers to the questions above makes me simply assume that the copula is not an inflectional affix. Furthermore, let us look at the following example:

- (8) k'ok hanbən man i - mni - ta.  
     just once only COP HON DECL  
     ‘This is the last time that I do for you.’

Here /man/ precedes the copula. To my knowledge, many labels like a particle, a delimiter, and a clitic have been employed to refer to /man/. In particular, the clitichood of /man/ is argued for as it is promiscuous in its host selection; it can attach to all sorts of categories (e.g., NPs, VPs, AdvPs), as follows:

- (9) a. salam-man - i ha - l - su - iss - ta.  
           man only NOM do-to-possibility-exit-DECL  
           'Only a man can do it.'
- b. nol - ki -man ha - ni?  
       play Inf only do QES  
       'Are you only playing?'
- c. cal - man ha - myən ton - il pəl - su - iss - ta.  
       well only do COND money ACC make  
       'If you do it well, you can make money.'

This argument is based on one of Zwicky & Pullum's (1983) tests for choosing between an inflectional affix and a clitic: clitics can exhibit a low degree of selection with respect to their hosts, while affixes exhibit a high degree of selection with respect to their stems.

Another piece of evidence showing that /man/ is not an affix comes from the following observation made by Kuno & Kim-Renaud (1987: 252-253):

- (10) a. sokim-man-ilo kimchi-l tamk- - l-su-iss-ta.  
           salt-only - with ACC make - to  
           'One can make kimchi with salt only.'
- b. sokim - ilo - man kimchi - l tamk- - l - su - iss - ta.  
           'One can make kimchi only with salt (and with nothing else).'

The sentence in (10a) means not only that one can make kimchi with all kinds of spice, but one can also make kimchi with salt alone, while (10b) means that it is only with salt that one can make kimchi. According to Kuno & Kim-Renaud (1987), (10a) represents an interpretation in which /man/ is of lower scope than /suiss/ 'can', while in the interpretation of (10b), /man/ has a higher scope than 'can'. This fact shows that /man/ can never be an affix assuming that an affix is an element strictly ordered with respect to adjacent morphemes. In contrast, the tests seem to favor

the clitic status of /man/. As a result the copula /i/ cannot be an inflectional affix by the following criterion: clitics can attach to a material already containing clitics, but affixes cannot (Zwicky & Pullum (1983)).

Next I reject the possibility to treat the copula as a derivational affix. The first evidence derives from negation. If the copula is a denominal verb-forming suffix, the derivative would end up as a verb. The Korean negation morpheme /an/ has been claimed by No (1988) to be a derivational prefix which occurs before a verb. The ungrammaticality of the sentence in (11 b) shows that a combination of the preceding nominal expression and the copula does not end up as a verb:



The second piece of evidence against treating the copula /i/ as a derivational affix derives from the assumption that derivational morphology and syntax do not interact. Let us examine the following example:

- (12) k+i salam -i coaha - nn sinpal - i - ta.  
          the man NOM like pres REL shoes COP DECL  
          ‘This is the shoes that the man likes.’

If the copula, as a derivational suffix, attaches to the preceding NP in derivational morphology and derives a verb, the derived verb would not combine with the preceding relative clause due to the requirement that any relative clause combine with a noun head not with a verb. The grammaticality of (12) shows that /sinpal i/ is not a derived verb.

A final criticism of treating the copula as a derivational affix comes from the relative position with respect to other grammatical categories. Let us consider the following example:

- (13) sinsa - til i - ta.  
gentleman PL COP DECL 'They are gentlemen.'

Kuh (1987) argues that the plural marker /t̚il/ in Korean is an inflectional

affix. Assuming that a derivational suffix is not preceded by an inflectional suffix, the copula /i/ cannot be a derivational suffix.

### 3.2. The Argument against Treating the Copula as an Independent Word

Since the copula is not an affix, it has to be given a syntactic category. It can be categorized as a syntactic verb because it shares its syntactic distribution with various classes of verbal free words: it has the same inflectional affixes with respect to tense as shown in (6). The sentence in (11c) also supports its syntactic verbal status because the negation morpheme /an/ only occurs before a verb. However, it has some peculiar syntactic characteristics. First, its complement never has any Case in contrast to its negation form /ani/:

- (14) a. John - i haksæng i - kuna.  
John NOM student COP EXCL ‘John is a student!’  
\*John-i haksæng - i i - kuna.  
student NOM COP EXCL
- b. John - i haksæng - i ani - kuna.  
John NOM student NOM NEG EXCL ‘John is not a student!’

This peculiarity could be formalized simply by different ID rules like (15) for introducing these verbs, /i/ and /ani/, respectively:

- (15) a. VP → NP, V[112]
- b. VP → NP[NOM], V[113]

It is necessary to introduce the echoed verb construction in order to point out the second syntactic idiosyncrasy of copula /i/. According to No (1988), the echoed verb construction has the following properties:

- (16) a. The verb base occurs twice, separated by a delimiter.
- b. The first occurrence of the verb base is followed by /ki/, which in turn is followed by a delimiter.
- c. The first occurrence of the verb base is not fully inflected.
- d. The second occurrence of the verb base occurs with inflectional affixes.
- e. The two occurrences of the base are morpheme by morpheme identical modulo inflection.

This construction is shown in (17):



This construction provides a test for an independent wordhood of a verb including a stative verb as well as an action verb. Now let us test the wordhood of the copula /i/ in (18):

- (18) a. Mary - ka haksæng i ki-nin haksæng i-ta.  
Mary NOM student COP  
'(I admit that) Mary is a student.'  
b. \*Mary-ka haksæng i ki-nin i-ta.  
c. Mary - ka haksæng - i ani ki-nin ani-ta.  
Mary NOM student NOM NEG  
'(I admit that) Mary is not a student.'

The sentence in (18b), where the copula /i/ stands alone in a verb position, is ungrammatical. Therefore I conclude that the Korean copula /i/ is not an independent word.

### 3.3. The Copula as a Bound Word

Up to this point, I have presented arguments against treating the copula /i/ as either an affix or an independent word. In this section I present the argument for the clitic status of the copula. The copula /i/ cannot occur in complete isolation, which is one of the criteria for identifying clitics (Zwicky (1985: 288)). This is shown in (19c):

The copula /i/ only can occur along with the preceding host.

For the purposes of this paper, I should give, before proceeding, a definition of a clitic provided by Nevis (1987: 252):

- (20) A clitic is a word or morpheme (possibly morphologically complex) that exhibits a mixed word/affix status.

The copula /i/, as a bound word, is expected to show a mixed status of a morpho-syntactic word and an affix. In this treatment, the copula is introduced as a formative in the syntax via ID rule as shown in (5). But it is expected to form a phonological word to condition a sandhi rule otherwise known to be internal (e.g., palatalization).

In general the phonological word has been claimed to range from being as small as a simple stem to being as large as a morphological word plus the clitics that have it as a host (cf. Zwicky (1977)). Now we can explain why palatalization applies in (4) by assuming that the copula /i/ is a dependent word that behaves just like an independent word syntactically but, phonologically, is attached to a preceding host obligatorily. A formative /i/, like all other formatives, must have a lexical entry and its lexical entry must include a phonological representation. The lexical phonological shape of copula /i/ would be expressed by the following hypothetical shape condition in Zwicky's terminology:

- (21) The copula has the lexical phonological representation /i/, unless its host ends in a vowel (in which case it is unrealized (i.e. =  $\emptyset$ )).

Since its phonological dependence can not be predicted, its lexical entry contains a feature (e.g., [+liaison]), which serves to trigger cliticization in the post-syntactic adjustment component, where cliticization is only sensitive to lexical category of terminal string (cf. Zwicky (1983)).

Jun's (1988) argument on the Chonnam dialect of Korean is consistent with the argument for the phonological word consisting of a morphological word and a clitic. According to Jun (1988), the Chonnam dialect has basically two kinds of pitch accent: LHL, HHL. She posits the basic accentual pattern as LHL and derives the HHL by some phonological rules because the latter shows up only when the initial segment of the phrase is aspirated or tensed. The minimal pair in (22) has the following accentual pattern in

this dialect<sup>3</sup>:

- (22) a. soth i - ta [sóchídà]  
           pot COP DECL  
       b. soch i-ta [sódi:dà] or  
           hold something [sódídà]  
           on head

The example in (22a) shows only one accentual pattern, while (22b) has the alternating accentual pattern, depending on the phrasing, because a phonological word basically forms a phonological phrase. The examples in (22) show that (22a) cannot be divided any longer while (22b) can be divided into two phonological words, and we know that (22a) constitutes itself a phonological word. This accentual evidence is perhaps not a strong argument for the phonological word because this dialect is different from the Seoul dialect which I am dealing with in this paper; the Seoul dialect has no such accentual pattern. But notice that palatalization does not apply even when (22b) has the same accentual pattern as (22a). It indicates that (22a) consists of a single phonological word, and (22b) of two phonological words.

In this section I have shown that the Korean copula /i/ should be treated as a bound word and be counted as belonging to a phonological word for the purpose of palatalization.

#### 4. Unique Underlying Representation versus Multiple Underlying Representation

In the preceding section, I hypothesized that the copula in Korean has two shapes, /i/ and  $\phi$ , by the shape condition (21). However, I will argue for another shape condition and compare it with the analysis under the unique underlying representation in this section. I propose hereby the following shape condition:

- (23) The copula has the lexical phonological representation /i/ when its

<sup>3</sup> Korean /s/ is considered to be aspirated. In the Chonnam dialect, the vowel length distinction only shows up phrase initially.

host ends in a consonant, otherwise it has the lexical phonological representation /y/.

Let us turn to the argument for such a shape condition. The following illustrates the past inflected forms:

- (24) a. mək-əss -ta. [məgət'a] 'I ate.'  
           eat PAST DECL  
       b. san      i - əss - ta. [saniət'a]  
       mountain COP PAST DECL \*[sanyət'a] 'It was a mountain.'  
       c. sinsa      y-əss -ta. [sinsayət'a]  
       gentleman COP      \*[sinsaiət'a] 'He was a gentle man.'

The shape of the copula, /y/, actually shows up not only in the past tense inflected forms but also in front of any verbal suffixes beginning with a vowel, [ə], as follows:

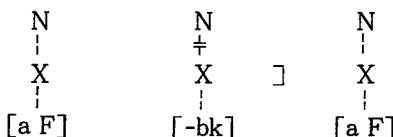
- |         |                           |                                 |
|---------|---------------------------|---------------------------------|
| (25) a. | i. mək-ətə                | [məgədə]                        |
|         | eat even though           | 'even though he eats'           |
| ii.     | sinsa y-ətə               | [sinsayədə]                     |
|         | gentleman COP even though | 'even though he is a gentleman' |
| iii.    | san i - ətə               | [saniədə] *[sanyədə]            |
|         | mountain COP              | 'even though it is a mountain'  |
| b.      | i. mək-əsə                | [məgəsə]                        |
|         | eat because               | 'because I eat'                 |
| ii.     | sinsa y - əsə             | [sinsayəsə]                     |
|         | gentleman COP because     | 'because he is a gentleman'     |
| iii.    | san i - əsə               | [saniəsə]                       |
|         | mountain COP because      | 'because it is a mountain'      |

Under this shape condition, the alternation between /i/ and  $\phi$  shown in (26) is explained by the phonotactic constraint prohibiting the offglide in Korean; glides are restricted to prevocalic position only in Korean.

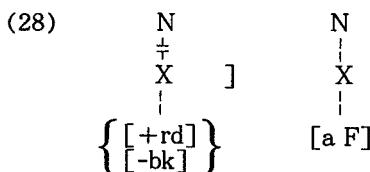
- (26) a. / *sinsa y -ta/* [sinsada] 'He is a gentleman.'  
                  gentleman COP DECL  
      b. / *san i -ta/* [sanida] 'It is a mountain.'  
                  mountain COP DECL

Up to this point I assumed that either the shape /i/ or /y/ for the Korean copula is chosen by way of the shape condition (23) instead of deriving one from the other. Here we need to look at the possibility of positing the unique underlying representation instead because the unique underlying representation is preferred unless an otherwise fully motivated analysis has to be set up. In order to account for the alternations among [i], [y], and [ϕ] in the Korean copula, /i/, among other possible candidates, can be best selected as the underlying representation. Then we need the following glide formation rule to account for the different behavior with respect to glide formation between (24b) and (24c):

## (27) glide formation



This glide formation rule says that the slot associated with the nucleus tier (i.e. a vowel) becomes a glide when adjacent to a vowel on the left and to another vowel onto the right across a morpheme boundary<sup>4</sup>. Notice that this glide formation rule is different from the glide formation rule such as (28) independently motivated to account for the examples in (29):



(29)	/ci - ə/	[cyə]
	lose stative suffix	
	/cu - ə/	[cwə]
	give stative suffix	
	/po - ə/	[pwa] <sup>5</sup>
	see stative suffix	

<sup>4</sup> I hereby assume the underspecification theory in Korean proposed by Sohn (1986).

<sup>5</sup> The vowel harmony responsible for the alternation between [a] and [ə] would not be considered in this paper.

The following minimal pair with respect to the past tense form nicely illustrates the different mode of application between the rules in (27) and (28):

- (30) a. i . cuk      i - ta.      [cugida]  
               oatmeal COP DECL      'That is oatmeal.'  
     ii. cuk      i - əss - ta.      [cugiat'a]  
               oatmeal COP PAST DECL \*[cugyat'a] 'That was oatmeal.'  
     b. i . cuki - ta.      [cugida]  
               kill      DECL      'He kills.'  
     ii. cuki - əss - ta.      [cugyat'a]  
               kill      PAST      DECL      \*[cugiat'a] 'He killed.'

Put another way, the glide formation rule in (27) is considered to apply only to the copula under the unique underlying approach. Notice also that the copula /i/ never undergoes the rule (28) even though it satisfies the structural description of that rule (cf. (30.a.ii)). One more rule such as (31) is needed to account for the zero occurrence of the Korean copula after a vowel<sup>6</sup>:

- (31)
- |       |       |
|-------|-------|
| N     | N     |
|       | +     |
| X     | X     |
|       |       |
| [a F] | [+hi] |

I introduce at this point another inflected copula form in Korean bearing on the question of which approach is more plausible.

- (32) a. mək-əyo.      [məgəyo]  
               eat INFORMAL DECL      'He eats.'  
     b. sinsa      y - eyo.      [sinsayeyo]  
               gentleman COP INFORMAL DECL      'He is a gentleman.'  
     c. san      i - eyo.      [sanieyo]  
               mountain COP INFORMAL DECL      'That is a mountain.'

The informal verbal ending shows up as /eyo/ after the copula but as /əyo/ elsewhere. Even though the unique underlying approach can deal with all

<sup>6</sup> This rule appears to apply before any vowel following a noun.

alternations shown up in the Korean copula, how can it account for the alternation between /eyo/ and /əyo/ in the informally inflected forms? Contrary to the expected ad hoc phonological rules, the realization rule for the informal verbal form would need two kinds of operation under the processual morphology: one operation would be a suffixation of /eyo/ after the copula, and the other an suffixation of /əyo/. Put another way, phonological alternations appearing as morphological processes are described in the morphology in the multiple underlying representation approach based on the processual morphology.

My aim in this section was not to argue for the empirical superiority of one approach over another, but only to show that the multiple underlying approach can be at least as coherent and adequate as the unique underlying approach that has been characteristic of generative phonology.

## 5. Palatalization and Cliticization

Now let us return to the question we addressed earlier in this paper—how to account for the application of palatalization before the copula. The copula, as a bound word, is a regular syntactic word that gets subordinated phonologically to a neighbor through a post-syntactic phonological linking rule known now as liaison which Nevis (1987: 254) defines as follows:

- (33) Liaison is a post-syntactic, postlexical phonological rule that subordinates one word to another.

It predicts that no phonological structure after liaison can be affected by any lexical rules. Thus the Korean copula after liaison is expected to condition only the postlexical palatalization rule as opposed to the lexical one. It amounts to claiming that there are two dental stop palatalization rules, lexical and postlexical. However, if there is such a postlexical palatalization rule, it would have more exceptions than non-exceptions unless it incorporates the following specific morphological information in the rule: this postlexical palatalization rule cannot affect any underived forms but affect the derived forms only through liaison. Such a state of affairs is not consistent with Lexical Phonology where postlexical phonology should not obey the Strict Cycle Condition. Therefore palatalization before the copula should

be lexical. Then the question arises as to how the syntactically derived structures can be referred to by the lexical rules in the model of Lexical Phonology. Here are two proposals regarding an adequate account of syntactic effect in phonology. One of them is Odden's (1988) Lexical Sandhi theory (henceforth LS) and the other is Hayes' (1988) Precompiled theory (henceforth PL). LS theory claims that the lexical rules and postlexical rules have direct access to syntactic structures by putting syntax throughout phonology. On the other hand, PL theory claims that no true phonological rules make direct reference to syntactic representations. Rather the precompiled rules, which are a subset of lexical rules, derive multiple diacritically marked allomorphs for certain classes of words by way of using a set of phonological instantiation frames which can be interpreted as a morphological diacritic feature. Both theories reject the claim that the application between words is diagnostic of the lexical and postlexical distinction. Because their predictions are almost same, I illustrate the palatalization rule before the copula /i/ in the framework of PL as follows<sup>7</sup>:



However, according to Hayes (1988), the rules of phonological spreading cannot be treated as precompiled. Assuming that assimilation is done by spreading an autosegment to the adjacent segment, the palatalization rule, then, cannot be precompiled; rather the copula /i/ should be simply analyzed as a phonological affix. This inference is compatible with the conclusion drawn by morphological consideration; the copula /i/ is a clitic which behaves as a syntactic word but phonologically as an affix. Therefore we conclude that the morpho-syntactic word is not isomorphic to the phonological word and liaison is performed (late) lexically, parallel to inflection to condition the lexical palatalization rule. In other words there are two ways

<sup>7</sup> /ina/ ‘as a last resort’, /ilang/ ‘CONJ’, /iya/ ‘it goes without saying that’, /ilato/ ‘as a last resort, even though this is not the best option’, etc. belong to the class specified for [+clitic].

of handling the misalignment of syntax and phonology: one is by way of precompilation to introduce syntactic representations to the lexical rules and the other is through liaison to make the phonological word derived by liaison undergo the lexical rules.

## 6. Other Rules Referring to the Phonological Word Domain

In this section, I explore the other rules which make reference to the phonological word as their domains and try to define the phonological word in Korean.

First, let us look at Korean Consonant Cluster Simplification (henceforth, CCS) in a coda (Kim-Renaud, 1978: 85; Kim, 1972: 162). Korean has underlying consonant clusters morpheme-finally but one of the two coda consonants is deleted by CCS. I provide the types of underlying consonant clusters in codas and their word final phonetic realization in (35):

(35) /ps/	/kaps/	[kap]	'price'
	/əps/	[əp]	'not exist'
/ks/	/nəks/	[nək]	'spirit'
/nc/	/anc/	[an]	'to sit'
/nh/	/anh/	[an]	'not'
/lp/	/palp/	[pap]	'to tread on'
/lph/	/iɒph/	[iɒp]	'to recite'
/lθ/	/halth/	[hal]	'to lick'
/lk/	/hɪlk/	[hɪk]	'soil'
/lh/	/ilh/	[il]	'to lose'
/lm/	/kulm/	[kum]	'to starve'

There are a lot of approaches to how to formulate the CCS (cf. Kim, 1972; Kim-Renaud, 1974; Ahn, 1985). Because its formulation is not the point of this paper, I simply adopt Ahn's formulation (1985: 168):

- (36) a.  $\left[ \begin{smallmatrix} -\text{cont} \\ -\text{cor} \end{smallmatrix} \right] > [+\text{lateral}]$   
          b.  $C_1 > C_2$

By this hierarchy, if a coda consonant cluster consists of [-cont, -cor]

and [+lateral], [-cont, -cor] is retained; otherwise, the first consonant remains.

In this paper I focus on the optional application of this CCS rule. According to Ahn (1985: 168), this rule applies only to nouns in the lexicon. He illustrates this with the following examples:

- (37) a. [[*tols*]<sub>N</sub>      i]      [tori]  
               anniversary NOM  
               'anniversary(NOM)'  
      b. [[*halth*]<sub>v</sub>      i]      [halchi]  
               lick derivational affix  
               (causative)  
               'let something be licked'

According to Ahn(1985: 169) only (37a) undergoes CCS, while (37b) undergoes palatalization instead because /halth/ is not a noun. But this is in fact not the case. In Korean, a coda cluster /ls/ was restructured to /l/ historically as shown in (38)<sup>8</sup>.

- (38) a. /kols/ > /kol/ ‘a direct road’  
           /kol#/     [kol]  
           /kol+i/    [kori]  
                   NOM  
           /kol+to/    [koldo]  
                   also

b. /tolz/ > /tol/ ‘anniversary’  
       /tol#/     [tol]  
       /tol+i/    [tori]  
       /tol+to/    [toldo]

It is a fact that CCS optionally applies when a noun ending with a consonant cluster is followed by a vowel as shown in Ahn's footnotes (1985: 181):

<sup>8</sup> Such a diachronic morphologization supports the morphocentric theory proposed by Joseph and Janda (1988) placing morphology in the center of a grammar relative to the other grammatical components like syntax, phonology, and semantics.

- (39) a. [[kaps]<sub>N</sub> #] [kaps' #] 'price(ACC)'  
     price acc. [kab#]  
 [[əps]<sub>V</sub> #] [əps' #] 'would not exist'  
     not ASP \*[əb#]  
     exist  
 b. [[talk]<sub>M</sub> i] [talgi] 'chicken (NOM)'  
     chicken NOM [tagi]  
 [[ilk]<sub>V</sub> i] [ilk'i] 'reading'  
     read noun \*[igi]  
     forming affix

However there is another context where CCS optionally takes place: with the copula /i/.

- (40) [[talk]<sub>N</sub> i - ko] [taligo] 'be a chicken and'  
     COP CONJ [tagigo]  
 cf. [[talk]<sub>NP</sub> [i - ko]]<sub>VP</sub> [tagigo]  
     hold something \*[taligo] 'hold a chiken on  
     on one's head one's head and'

On the basis of the above examples, I conclude that the optional CCS applies only within the domain of the phonological word. Here I propose an optional resyllabification rule as shown in (41) rather than applying CCS optionally.

(41) Optional Resyllabification Rule

[[ ]<sub>N</sub> X ]domain: phonological word

The rule in (41) means that resyllabification occurs optionally as long as the phonological word consists of lexical category, noun and X. Here X refers to a clitic or an affix. The application of (41) bleeds CCS. The derivations are shown in (42):

- (42)
- |   |  |               |
|---|--|---------------|
| a. kapsil   | $\begin{array}{c} [[\text{kaps}] \text{il}] \\ \backslash \quad \backslash \quad \backslash \\ \sigma \quad \sigma \quad \sigma \end{array}$ | b. _____ (41) |
| <hr style="border: none; border-top: 1px solid black; margin-bottom: 10px;"/> |  |               |
|   | $\begin{array}{cc} \text{kap} & \text{il} \\ \backslash & \backslash \\ \sigma & \sigma \end{array}$   | CCS           |
| [kaps' #]   |  | [kab#]        |

Only (42b) satisfies the structural description of CCS, and undergoes it giving rise to [kabil] after the voicing rule.

To give support for such a resyllabification rule (41), we examine other cases showing the necessity of such a rule. There is a rule which changes all coronal obstruents into [s] as discussed in Kim Renaud (1974:184) and Ahn (1985: 172). It requires the lexical category information 'N' because it applies only to nouns as shown in Ahn (1985: 173):

(43)	[[cəc] #]	[cəjɪl]	stratum 4
	'milk' ACC	[cəsɪl]	Case marking
	[[cəc] #] 'would get wet'	[cəjɪl]	stratum 4
	get wet ASP	*[cəsɪl]	inflection

Ahn (1985: 172) formulates the rule as (44) and confines it only to stratum 4 in the framework as shown in (3) because he assumes that this rule applies only to a noun followed by case markers in his framework:

- (44) Unreleased Obstruent Neutralization (optional)<sup>9</sup>

$$\left[ \begin{array}{l} +\text{obst} \\ +\text{cor} \end{array} \right] \rightarrow [\text{s}] / \_ \text{N} + \text{V} \text{ (domain: stratum 4)}$$

But this rule is not sufficient to capture all applications because it applies not only at stratum 4 but also at stratum 3. Let us look at the relevant examples<sup>10</sup>:

(45) a.	[[path] i - ta]	[pachida]	or
	field COP DECL	[pasida]	'this is a field'
	[[koch] i - ta]	[kochida]	or
	flower COP DECL	[kosida]	'this is a flower'

<sup>9</sup> Kim Renaud (1974: 184) applies the rule (44) before allative case marker /e/ (cf. /path-e/) [pathe] or [pase]), while Ahn(1985: 181) does not.

<sup>10</sup> The following forms are derived by the same derivation as (45b):

/sath sath - i/	[satsachi] or [satsasi]	'all over'
the inside of the thigh		
/al al - i/	[arari]	'egg by egg'
egg		
/nal nal - i/	[nanari]	'from day to day'
day		
/tal tal - i/	[tadari]	'from month to month'
month		

- b. [[nath nath]<sub>N</sub> i] stratum 3 (derivation)  
 a piece adv  
 forming affix 'thoroughly, piece by piece'  
 [nannachi] or [nannasi]

The examples in (45a) show the application before the copula, while (45b) shows its application at stratum 3. Therefore the generalization captured by the rule (43) is not correct. Here we can find the similarity between the domain of optional CCS and optional obstruent neutralization: both optional rules apply only within the phonological word consisting of a lexical category N plus X. In optional obstruent Neutralization rule, X could be a clitic or a derivational affix. Therefore, by positing the optional resyllabification rule (41), we can explain the optional application of both rules. After the resyllabification rule, only a syllable final coronal obstruent can be subject to the neutralization rule as shown in (46):

(46)	$[[\text{path}] \text{ h}]$		
	field ACC		
a. path <sup>h</sup>		b. _____ (41)	
			(44)
[path <sup>h</sup> ]		[pas <sup>h</sup> ]	

We need to mention one more fact: in Korean, there is an obligatory obstruent neutralization rule in a syllable coda position like (47).

(47)	$\left[ \begin{array}{l} +\text{obst} \\ \alpha \text{ cor} \end{array} \right] \rightarrow \left[ \begin{array}{l} -\text{tense} \\ -\text{asp} \\ \alpha \text{ cor} \end{array} \right]$	/ _____ ] $\sigma$
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This rule changes syllable final consonants /p, p', ph/ to [p] and /t, t', ch, s, s', c, c'/ to [t] and /k, k', kh/ to [k]. This rule applies to any lexical category. To distinguish these two kinds of obstruent neutralization, I will call the optional obstruent neutralization ON I and the obligatory obstruent neutralization ON II. Now along with optional resyllabification rule, ON I can be simply described as follows:

$$(48) \quad \begin{bmatrix} +\text{obst} \\ +\text{cor} \end{bmatrix} \rightarrow \begin{bmatrix} -\text{tense} \\ +\text{cont} \end{bmatrix} / \underline{\quad} \sigma \quad V$$

ON I has to be disjunctively ordered with respect to ON II by the Elsewhere Condition in the sense of Kiparsky (1973).

We can naturally draw the conclusion that the phonological word in Korean consists of a morphological word plus either clitics or affixes because the resyllabification rule as well as palatalization applies in the domain of the phonological word consisting of such units.

Now let us move onto the question whether compounding forms a phonological word by applying sandhi rules otherwise known to be internal to the phonological word<sup>11</sup>.

- (49) a. [[path] [ilang] ] [padirang] or [pannirang]  
     field     ridge               \*[pasirang]    \*[pachirang]  
     ‘field ridge’
- cf. [[path] ilang]       [pachirang] or [pasirang]  
     field CONJ  
     ‘field and’
- b. [[kaps] [əchi] ] [kabəchi]  
     price     worth           \*[kaps' əchi] ‘value’
- cf. [[kaps] i]           [kaps' i] or   [kabi]  
     price   NOM

Both palatalization and optional resyllabification do not apply to the compounds. Thus we can conclude that clitics or affixes form phonological words with morphological words while [word + word] cases form phonological phrases.

## 7. Conclusion

In this paper I have shown that the Korean copula /i/ is a bound word which exhibits a mixed word/affix status. The copula gets subordinated

<sup>11</sup> Nasal assimilation is triggered by /n/ insertion in (49a) which applies only in compounds and described as follows:

$\phi \rightarrow n / C ]_N \underline{\quad} [ \{ \overset{i}{y} \} ]$

phonologically to a host through liaison which is performed at the late lexical strata. Such a liaison explains the mismatch between the morpho-syntactic word and the phonological word. Thus the word internal sandhi rule like the lexical palatalization rule can apply to the output of liaison.

Also the phonological word has been defined in terms of the combination of a morphological word and clitics or affixes based on the fact that both palatalization and optional resyllabification need the phonological word for their domains. However notice that if both rules are said to apply only to stratum 3 & 4 in the framework as shown in (3), the phonological word need not be specified for their domains. Therefore, the question about positing the phonological word as a prosodic category still remains unresolved.

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