Internal Structure of Korean Obstruents: A Dependency Phonology Approach*

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0. The purpose of this paper is to suggest a new internal structure of Korean obstruents under the framework of Dependency Phonology. In Anderson and Ewen (1987) and Kang (1991), the internal structure of Korean obstruents was represented as the predominance relation of two components: |O| and |C|. To be more specific, plain obstruents were assumed to be the combination of the two components as shown in C:|O|, while the aspirated and tense ones were represented as |O|:C and C:|O|, respectively. In this paper, I will suggest that the following representations would be more appropriate for the internal structure of Korean obstruents:

(1)

C	C	C	O
	|	|	
	C	O	
plain	tense	aspirated	/h/

My proposal will be supported by the several representational advantages found in dealing with the phonological processes in Korean.

The study of internal structure of segments began with the idea of Feature Geometry (Clements 1985, 1991, Sagey 1986, 1988), in which it was claimed that the features are not randomly arranged but hierachically organized. Nobody is sure of the

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structure of the internal organization because it is not to be seen. We can only guess at it through the phonological processes found in the languages of the world. Given the situation, one of the criteria of choosing the correct one would be that of *simplicity*. When the two hypotheses can explain the phonological phenomena, the simpler one is naturally preferred. In the following sections, three phonological processes of Korean will be dealt with: neutralization, aspiration, and tensification. Finally, the representational issue of phonology will be discussed with respect to general phonological and phonetic characteristics.

1.1 In Korean, the aspirated and tense obstruents are neutralized into plain ones in the syllable-final position as in (2).

(2) a. p, p^h, p′ ⟶ [p]
b. t, t^h, t′, s, s′, c, c^h, c′ ⟶ [t]
c. k, k^h, k′ ⟶ [k]

(3) lists some examples of neutralization.

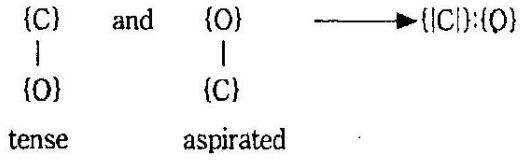
(3) /sup^h/ ⟶ [sup] 'forest'
/mit^h/ ⟶ [mit] 'bottom'
/pus/ ⟶ [put] 'brush'
/is′-/ ⟶ [it-] 'to exist'
/pic/ ⟶ [pit] 'debt'
/k′oc^h/ ⟶ [k′ot] 'flower'
/pək^h/ ⟶ [pək] 'kitchen'
/pak′/ ⟶ [pak] 'outside'

Neutralization process in Korean can be divided into two steps: first, tense (transcribed by apostrophe′) and aspirated consonants become plain ones and second, fricative and affricate obstruents turn into stops.[1]

[1] The change of place of articulation is also involved here and the process can be described as

Under the representation first suggested by Anderson and Ewen (1987) and adopted by Kang (1991), the process of neutralization was not neatly described. In Kang (1991:41), it was formalized as the loss of dependency relations between |C| and |O|.

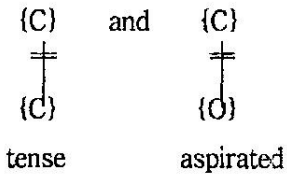
(4) Loss of dependency relation (Kang 1991:41)



In (4), the loss of dependency relation is not described as simple as that of feature geometry framework, in which the process is characterized as the delinking of laryngeal features. (Kim, K-H. 1987). Rather, the process of losing dependency relation should be somehow assumed to take place.

Under the proposal of this paper, however, we can describe the process as delinking of dependent components as shown below.

(5) Neutralization in Korean



According to my proposal, tense and aspirated consonants are represented by the dependent components |C| and |O|. These dependent components are deleted as a result of delinking process. My proposal, however, does not influence the second process of changing categories. For the fricative to be a stop ({C:V} ⟶ {C}), the |V| component is deleted. In affricates where stop governs fricative ({C} ⟶ {C:V}), the fricative is delinked. (Kang 1991:41).

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the delinking of {||,||} in the articulatory gesture (cf. Kang (1991:41)).

1.2 In this section, we will see how my proposal will influence another phonological process in Korean: aspiration. Aspiration is a post-lexcial rule and thus has no exception.

(6) a. /cap + hi/ ⟶ [cap^{h}i] 'be caught'
/tat + hi/ ⟶ [tac^{h}i] 'be closed'[2]
/mək + hi/ ⟶ [mək^{h}i] 'be eaten'

b. /coh + ta/ ⟶ [cot^{h}a] 'be good'
/silh + ta/ ⟶ [silt^{h}a] 'be not good'

This process is formalized as the spreading of |O| component to the adjacent obstruents. Following the previous representation, however, we cannot describe the process as a simple spreading of |O| component. This is not enough to arrive at the internal structure of segment we want. For example, /p + h/ -> [p^{h}] is represented as in (7):[3]

(7) {C}:{O}..... {O}
\ |
{O} {C}
/p/ /h/ /p^{h}/

From (7), we can just guess that the spreading of |O| component somehow strengthens the |O| component of /p/, resulting in /p^{h}/ in which |O| component governs |C| component.[4] The problem is that the result is not directly shown.

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[2] In this example, palatalization changes [t^{h}] into [c^{h}].

[3] Articulatory gesture of /p/, {l,u}, is not relevant here and so we omit it.

[4] Probably we may calculate the power relation by counting the number of components involved. However, this is not that simple as it seems. For one thing, we should define the strength of governing component and governed one (e.g. two components in the dependent are equal to one in the governing position). Even if we can do this, this would make the system more complicated (e.g. when the two components in the dependent position are the same ones, then should we move them to the governed positon or not?). I won't go further for this issue.

However, under the new representation, we can see the effect of the rule without any guess or assumption, as (8) shows.

(8) {C}..... {C}
\ |
{O} {O}
/p/ /h/ /p^h/

The spreaded component |O| becomes the dependent of the target component, making it the aspirated obstruent /p^h/.

Of course, the rule should be formalized such a way that it could explain the data (6b) as well as (6a). Under the generative framework, the rule can be formalized roughly as (9).

(9) [-son, -conti] ⟶ [+aspirated] / % [+aspirated]

So far, the representational device like % has not been used in dependency phonology. Thus the same effect will be achieved if we borrow %. The formal representation of the rule would be like (10).

(10) Aspiration in Korean

{C} ⟶ {C} / % {O}
|
{O}

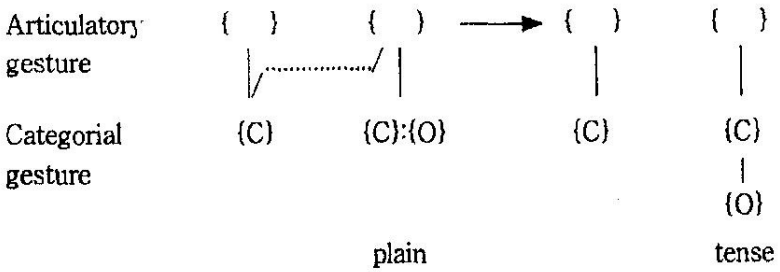
1.3 Another representational advantage is seen in the tensification process in Korean, in which plain obstruents are tensified after another obstruents. The rule takes place within the boundary of Phonolgical Word as following data show (Cho 1987, Kang 1995).

(11) a. /cikɕak/ ⟶ [cikk'ak] 'right angle'
/kikcaŋ/ ⟶ [kikc'aŋ] 'theater'
/capɲi/ ⟶ [capp'i] 'sundries'
/məkpo/ ⟶ [məkp'o] 'person who eats a lot'

b. /pap+to/ ⟶ [papt'o] 'rice too'
/mək+ko/ ⟶ [məkk'o] 'eat and'

In Anderson and Ewen (1987) and Kang (1991), tense obstruents were represented as the preponderance of |C| component over |O| component. Thus the tensification rule was formulated as the spreading of |C| component of the triggering segment as shown below.

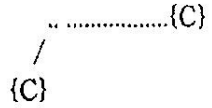
(11) Tensification in Korean (1991:121)



As in the case of aspiration, we should somehow assume that the spreading of the |C| component in categorial gesture strengthens the power of |C| in the target segment, making it the dominating one.

This representational disadvantage is overcome under the new representational system. The process is still the same in that the trigger spreads the |C| component in the articulatory gesture, but that's all. We don't have to stipulate or suppose that the number of components has something to do with the power of that component. This is shown in (12)

(12) Tensification in Korean



The spreaded component becomes the dependent of the target segment and the

resultant structure is that of tense obstruents; i.e. {C→C}.

2.0 Finally, I would like to discuss some theoretical implications these representational system entails. First, the new representation reflects phonetic reality more clearly. In the former structure, the degree of aspiration was represented by the dependency relation between the two components; |C| and |O|. A question is, however, how come the component |O| is shown in the internal structure of tense obstruents where there is no aspiration involved at all.

Another, more serious, problem found in the previous system is that aspirated segments cannot be included in the natural class of obstruents. According to Anderson and Ewen (1987:158), the natural class of obstruents is represented as {C ⟶ }, segment in which |C| component are located in the governing position. This definition, however, does not include the aspirated obstruents if we follow the system of Anderson and Ewen (1987) and Kang (1991), because in theirs |C| is not dominating but dominated by the |O| component. This issue is also solved neatly in the new system, in which three kinds of all Korean obstruents share the common feature: |C| in the dominant position.

Finally, If we stick to the former representation, we might give others an impression that Korean plain obstruents are different from those of other languages because only Korean obstruents have |O| component.

3.0 In this paper, I proposed a new version of phonological representation for Korean obstruents under the framework of Dependency Phonology and showed that this one is better than the previous one in describing three Korean phonological processes: neutralization, aspiration, and tensification. Unlike English or other languages, Korean has three series of voiceless obstruents: plain, aspirated, and tense. In this paper, it was suggested that these ones be represented as {C}, {C:O}, and {C:C}, respectively.

The term 'feature' is said to cover two notions: classificatory and componential one (Goldsmith 1990:274-275). The latter interpretation is in a way similar to that of chemistry. Water consists of two Hs and one O: H_2O. Anybody who learned the ABC of chemistry know that H_2O means water. But we cannot see any chemical components with our eyes. Nor do we see its hierarchical structure. But we can

explain the nature of water by supposing the internal structure of water as such.

In the same way, in phonology what we have is only what we hear. Now it is a well-known fact that the string of sounds is divided into sentences, words, morphemes, syllables and finally segments. What is not clear is the internal structure of segement, which is assumed to be made up of features or components (if we use the terminology of Dependency Phonology). Given the situation, the phonolgical processes can provide us with the window through which we can look into the internal structure of segments.

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