

The Position of [lateral] in Feature Geometry

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<Abstract>

최근 음운론에서 lateral 자질이 자질수형도에서 어디에 위치하는가에 대해 두 가지 접근이 있어 왔다. Levin(1988)은 lateral이 coronal에만 나타나는 제약에 기초해서, lateral 자질이 coronal 마디의 의존자질이라고 주장한다. 이에 반해 Rice & Avery(1991), 그리고 Shaw(1991)는 lateral 자질이 자질수형도의 위쪽에 위치한다고 주장한다. 이 두 이론을 비교하기 위해 본 논문에서는 다음과 같은 내용의 음운론적인 요소들과 음성학적인 요소들을 고려한다. 첫째, 음성학에서 lateral의 기능은 lateral이 일반적으로 수형도 위쪽에 위치하는 것으로 간주되는 조음방법 자질이라는 것을 시사한다. 둘째, Papuan 언어군에서 보고된 velar lateral의 존재는 lateral이 coronal에만 나타난다는 제약을 무효화하면서 Levin이론의 전체를 의심스럽게 한다. 셋째, 몇 가지 다른 유형의 동화 현상에 대한 논의는 동화 현상이 lateral이 수형도의 위쪽에 위치하는 이론에서 더 잘 설명된다는 것을 보여 준다. 마지막으로 Chumash와 Tahltan의 coronal harmony에서 나타나는 lateral의 transparency와 Cambodian과 Javanese에서 나타나는 OCP효과 따위도 lateral이 조음위치 마디의 의존 자질인 이론에서는 설명될 수 없는 underspecified lateral의 증거를 제시한다. 이와 같은 논의에 기초해서 본 논문의 결과는 lateral이 수형도 위쪽에 위치한다는 주장이 옳음을 보여준다.

1. Introduction

Two approaches to the position of the feature [lateral] have been proposed in recent literature. Based on laterals' restriction to the coronal place, Levin (1988) argues that the feature [lateral] is a place -dependent of the coronal node. In contrast, Rice and Avery (1991) and Shaw (1991) argue that [lateral] resides higher in the feature tree (Rice and Avery put [lateral] under the spontaneous voicing node, while Shaw treat it as an immediate daughter of root node.) In this paper, I will focus on the question whether [lateral] is under coronal or higher in the tree.

To compare the two theories, I will consider the following questions. Does the position of [lateral] within the respective theories match its functional role? How do the theories capture feature cooccurrence restrictions? How do they explain phonological phenomena in which laterals pattern with coronals? How do they explain phonological phenomena in which laterals do not pattern with coronals? How do they explain phonological phenomena in which laterals pattern with other sonorant consonants such as nasals? Are they compatible with underspecification theory? The discussion of the above questions will lead us to the conclusion that [lateral] should be treated as a root dependent, not a coronals dependent feature.

2. Functional Role

As discussed in Rice and Avery (1991), the status of [lateral] as a place dependent is at odds with the general assumptions in which [lateral] is treated as a manner feature. It seems obvious that [lateral] characterizes different phonetic properties from the usual place features such as labial, dorsal, anterior, etc. which typically characterize the specific articulator involved in sound production. If this functional aspect of [lateral] in phonetics is considered, it would be more plausible to position it higher in the tree, like the feature [nasal].

3. Restriction to Coronal

Laterals typically do not occur with places other than coronal. Within Levin's (1988) theory, this cooccurrence restriction is captured directly in the structure of feature geometry. Since [lateral] is a dependent of coronal, it cannot be linked to other place nodes. Rather, any reported case of non-coronal laterals would be a counterexample to Levin's theory. According to Levin (1988), some velar and palatal laterals have been reported. She attempts to avoid this problem by assuming complex articulations for them:

- (1) velar laterals as complex corono-dorsal segments (Levin 1988:12)

[lateral]

Coronal Dorsal

Place

Since Levin assumes a complex corono-dorsal representation for both velar and palatal laterals, I will just focus on the velar laterals in the following discussion without losing any important generalizations⁵). Levin does not mention any other non-coronal laterals. I am not aware of any other non-coronal laterals, either. If the above representation is correct, why are other non-coronal laterals not reported? In principle, any articulator can form a doubly-articulated segment with coronal (dominating [lateral]). What is more interesting is why only velar, not labial, can form a doubly-articulated segment with coronal dominating [lateral]. This seems to have something to do with the possible range of laterals. Let us consider the definition of [lateral] by Chomsky and Halle (1968):

- (2) Lateral sounds are produced by lowering the mid section of the tongue at both sides or at only one side, thereby allowing the air to flow out of the mouth in the vicinity of the molar teeth...

5) In distinguishing between velar and palatal laterals, Levin (1988:34) states, "...the mere presence of specifications for [anterior] and [distributed] distinguishes such palatal laterals from velar laterals which lack specifications for [anterior] and [distributed]."

It is obvious that laterals should involve the tongue as an articulator. Thus, according to the definition of [lateral], dorsals can have laterality even though the possibility is low compared with coronals which involve the laminal part of the tongue. In contrast, labials have no chance to be laterals since they do not involve any part of the tongue in the articulation. In other words, the existence of velar laterals and the nonexistence of labial laterals do not seem to be an accident, as it would be in Levin's analysis of velar laterals: if velar laterals are actually doubly-articulated, labial laterals are also predicted. In other words, velar laterals are real velar laterals, which is predicted from SPE definition of [lateral]. Consequently, the approach assuming [lateral] as a coronal dependent cannot provide a plausible account for velar laterals.

We are now in a position to discuss how an approach positioning [lateral] high in the tree deals with the cooccurrence restrictions on laterals. Since this approach allows [lateral] to cooccur with any articulator, the universal marking condition such as (3) has to handle the feature cooccurrence restrictions.

- (3) *[lateral, labial or dorsal]

This constraint allows only coronal laterals. This kind of universal condition is commonly used in the current phonology to capture feature cooccurrence restrictions. For instance, the constraint *[+son, -voice] excludes the possibility of voiceless sonorants. Thus, positing the constraint (3) seems plausible. There is an advantage to this kind of marking condition compared to Levin's (1988) proposal in which non-coronal laterals are structurally excluded in the geometry tree. The stages of the derivation in which the marking condition applies can be defined. Also, the point in which the application of the condition ceases can be defined. Thus, it is open to the possibility in which the condition does not hold. More specifically, laterals with a place other than coronal, velar laterals, can be derived.

Consequently, the existence of velar laterals can be a serious problem for the approach assuming [lateral] as a coronal dependent feature, while it can be easily couched in the approach positioning [lateral] high in the tree.

4. Phonological Behavior

4.1. Coronal Behavior

Laterals pattern with coronals in a number of phonological phenomena. To consider how the two theories can deal with the coronal behavior of laterals, I will discuss Selayarese nasal assimilation, discussed by Levin (1988). This discussion will be closely bear on the discussion in section 3.

(4) Selayarese Nasal Assimilation (Mithun and Basri, 1985, from Levin)

- g. annam poke '6 spears'
- h. annan tau '6 persons'
- i. annan rupa '6 kinds'
- j. annaN jaran '6 horses'
- k. annaN koko '6 gardens'
- l. annal loka '6 bananas'

The final nasal assimilates in place to the following consonant. Notice that in (41), the nasal completely assimilates to the following lateral. Within the approach assuming [lateral] as a coronal dependent, this lateral assimilation results from regular place assimilation since whenever place (more specifically coronal) spreads, its dependent, [lateral] has to spread. Thus, the feature geometry itself predicts this kind of place assimilation with [lateral].

The approach positioning [lateral] high in the tree has to treat this place assimilation in a more complicated way, since the spreading of [lateral] will have to follow place assimilation separately. Thus, Levin's theory is more successful since any motivation for independent lateral spreading is not known. In section 4.3., I will deal with lateral assimilation independent from place assimilation.

4.2. Noncoronal behavior

In Korean, [lateral] does not undergo place assimilation, unlike other coronals:

- (5) (i) t k --> k k

- (ii) t p --> p p
- (iii) l k -/-> k k
- (iv) l p -/-> p p

To explain this noncoronal behavior of [lateral], Yip (1990) and Cho (1991) propose the opposite assumptions. Yip proposes that only the lateral has place feature whereas the other coronals are underspecified with respect to place, and thus only the latter are susceptible to Place spreading. Ironically, Cho proposes the opposite assumption, that only lateral is underspecified with respect to place and so does not have a place node as a target for spreading. Roughly speaking, Yip's proposal is compatible with Levin's theory of [lateral] whereas Cho's proposal is compatible with the approach positioning [lateral] high in the tree. This is because Levin's theory cannot underspecify the place of [lateral], but the other theory can. Therefore, comparing Yip's and Cho's theories may help determine which approach is preferable concerning the position of [lateral].

It seems Yip's theory needs an additional mechanism to explain the directionality of right-to-left place spreading.

- (6) (i) k t -/-> k k
- (ii) p t -/-> p p

Actually, Cho's proposal is subject to a similar argument since it requires the place node, which cannot simply be classificatory, to be a target of the spreading. But, there is a better treatment which is compatible with the approach positioning [lateral] as a root dependent. Once the spreading of place is specified as right-to-left, we do not have to worry about the resistance of [lateral] since the universal marking condition, which prohibits laterals with place specification other than coronal, will prevent dorsal or labial from spreading onto a [lateral] segment. Consequently, the noncoronal behavior of the Korean lateral can best be explained by the approach treating [lateral] as a root dependent.

4.3. Lateralization

In Korean, [lateral] spreads to adjacent homorganic sonorants in bidirectional

fashion (i, ii). Also, like nasals, [lateral] spreads to adjacent non-nasal coronals in a right-to-left fashion (iii-vi).

- (7) (i) n l --> l l
- (ii) l n --> l l
- (iii) t l --> l l
- (iv) l t -/-> l l
- (v) n t -/-> n n
- (vi) t n --> n n

Thus, the best solution to the data in (7) will be that [lateral] spreads to the adjacent homorganic sonorant consonant bidirectionally after right-to-left spreading of [+son] between adjacent consonants. (This is very similar to the treatment of Rice and Avery (1991), except that it does not assume the spontaneous voicing node.) The simplest rule would refer to only the trigger and the target of spreading. Thus, if [lateral] is a root-dependent, the rule would plausibly be stated as follows:

- (8) mirror image
 [+son, +cons] [+son, +cons]

lateral

However, if [lateral] is a coronal dependent, the rule has to include the information about sonority which is neither target nor trigger of spreading:

- (9) mirror image
 [+son, +cons] [+son, +cons]

coronal coronal

lateral

If the place node is not classificatory⁶⁾, this will be even worse since the rule

includes "PLACE" node which, like the root node, is not actively involved in the rule. Consequently, the simplest rule of Korean lateralization prefers the positioning of [lateral] high in the tree.

I conclude that the approach treating the lateral as a root dependent seems better than Levin's approach, in dealing with the phonological behavior, except place assimilation with [lateral]. However, since in the analysis of place assimilation with [lateral], positing an independent spreading of [lateral] is not ad-hoc as discussed in section 4.3., this is not really problematic for the approach assuming a root dependent lateral.

5. Underspecification

The two theories that we have discussed thus far make different predictions with respect to the underspecification theory. As was discussed briefly in section 4.2., if [lateral] is a dependent of the coronal node, it will be difficult to underspecify the place of [lateral], since the existence of [lateral] is higher in the tree, the place of [lateral] can be underspecified since the place can be predicted from the existence of [lateral]. Shaw (1991) elaborates this point by discussing the transparency of [lateral] in Chumash Coronal Harmony and Tahltan Coronal Harmony. To the same end, Yip (1990) discusses OCP effects in Cambodian and Javanese. I will here summarize Shaw's analysis of Chumash coronal harmony.

In Chumash, all coronal sibilants assimilate for the feature anterior to the rightmost sibilant:

(10) Chumash [anterior] harmony (Shaw 1991:140)

a. k-sunon-us	'I obey him'
k-šunon-š	'I am obedient'
b. ušla	'with the hand'
usla-siq	'to press firmly by hand'
c. uqsti	'of throwing'
š-uxšti-meš	'throw over to'

6) A class node, which has classificatory function only, does not operate as an autosegment: it is just an abstract category.

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6) A class node, which has classificatory function only, does not operate as an autosegment: it is just an abstract category.

- d. /s-iš-tiši-yep-us/ 'they two show him'
[s-is-tisi-yep-us] (3-dual-show-3obj)

However, the coronal segments /t n l/ are transparent in the assimilation process.

(11) Chumash Transparent Segments (Shaw 1991: 141)

- a. š-api-co-it 'I have good luck'
 s-api-co-us 'he has good luck'
b. k-šunon-š 'I am obedient'
 k-sunon-us 'I obey him'
c. ha-s-xintila 'his Indian name'
 ha-š-hintila-waš 'his former Indian name'

Also, they are neither triggers nor targets of [+anterior] spreading. If we assume that the target of [+anterior] spreading is coronal, /t n l/ should not have coronal when the assimilation occurs, since otherwise they will undergo the assimilation. Consequently, /l/ will be underspecified with respect to place, supporting the argument that [lateral] is high in the tree, not under coronal.

6. Conclusion

To decide the location of [lateral] in feature geometry, several phonological aspects were considered: the function of [lateral] in phonetics, feature cooccurrence restrictions, phonological behavior, and underspecification theory. From the discussion of these aspects, it is concluded that [lateral] is high in the geometry tree, not under coronal.

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