Phonological Explanations
on the Pronunciation Errors of the Chinese Learner:
Focusing on the Korean Liquids in Syllable Boundary

Lee, Hwa Jin Hongik University (first author)
Ha, Ho Bin   Hongik University (corresponding author)

Ⅰ. Introduction

The general L_2 learners have the rigid phonological systems of their own languages. To L_2 learners, therefore, pronunciation of target language in native speaker's way is the task requiring large burden. If the phonological distance exists between L_1 system and L_2s', the burden becomes heavier.

A Chinese learner who aims at Korean language also has some struggles as the general L_2 learner. Chinese language has the exact contrastive aspects of the Korean phonological system that causes some difficulties. It causes the errors that Chinese learner pronounces primarily.

One of the prominent aspects in Korean pronunciation error that Chinese learner makes frequently is related to the liquid pronunciation. There are two types of liquid, that is, 'l' and 'r', in both languages. In Korean phonological system, however, they are the allophones of a phoneme, whereas in Chinese they are two different phonemes. These aspects that both phonological systems have the similarity and distinctiveness simultaneously cause the difficulty in Korean liquid pronunciation.

This study aims to analyze the Korean liquid pronunciation errors of the Chinese learner that occur in syllable boundary. The traditional analysis of L_2 learner's pronunciation error is based on the contrast of a phoneme inventory between L_1 and L_2. In this study, however, the analysis is primarily based on syllable tier. The error analysis with contrasting phoneme inventory is somewhat unclear in syllable sequence. Therefore the phenomena such as [l] alternation error should be analyzed by the process of syllabification.

II. The Error Based on the Phoneme Contrast

The L_2 pronunciation error is mainly regarded as caused by the contrast of phoneme inventory. As the learner's error is generally caused by interference of L_1 system, the cause of pronunciation error also can be analyzed as the difference of phoneme inventories between L_1 and L_2.

In terms of phonemic distribution, Chinese language has two types of liquid 'l' and 'r' whereas Korean language has only one liquid. It is the basis of analysis that Chinese learner pronounces Korean lateral in the syllable coda position as retroflex (허용 & 김선정, 2006; 강석진, 2010). In addition to Korean lateral coda, the Chinese learner cannot apply the rule that alters a lateral coda to a flap onset frequently. It can be analyzed as the absence of flap liquid in Chinese language causes error (한재영, 2003; 김길동, 2008; 김태경 & 박초롱, 2014).

To Chinese learner, the case that initial liquid preceding vowel or final liquid following vowel offers the environment causing errors easily (신호철, 2003).[1] Since the interference of lateral onset in Chinese learner's lexicon, it can be represented as [ma.li], [mal.i] and [mal.li]

in the situation that Chinese learner pronounces '말이[mali]'.

Phonetically, Korean liquid has two types of sound that are called the flap [ɾ] and lateral [l] in the criterion of the representing position, whereas Chinese liquid is separated to retroflex [ʐ] and dental [l] (Duanmu, 2000).[2] Prima facie, it can be seen as the Korean flap [ɾ] corresponds to the Chinese retroflex [ʐ] and the Korean lateral [l] corresponds to the Chinese dental [l]. However, it doesn't make sense because of the fact that the Korean liquids are all alveolar sounds while the Chinese retroflex [ʐ] is not a member of alveolar (이화진, 2012).

Table 1. The contrast between Korean and Chinese in liquid sound

Alveolar		Retroflex	
Korean	Chinese	Korean	Chinese
[l]	[l]		[ʐ]
[ɾ]			

The Korean lateral [l] and flap [ɾ] belong to the same phoneme category displaying complementary distribution, whereas the Chinese [l] and [ʐ] are not the same phoneme. In Korean language, [ɾ] is only represented as the surface form after syllabification. In Chinese language, however, [l] and [ʐ] can be freely distributed regardless of underlying representation or surface form.[3]

This basic contrast between Korean and Chinese offers the criteria of

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1 The vowel that follows preceding liquid is restricted to grammatical element, such as a suffix.

2 Korean liquid can be represented as [ʎ] when the palatal vowel [i] or palatal glide [y] is followed (배주채, 2011; 이진호, 2014). Also liquid sequence in syllable boundary can be represented as [ʎʎ] (이진호, 2014). In this study, however, those are categorized as same lateral sounds in terms of the manner of articulation.

3 Chinese retroflex [ʐ] also can be treated as the syllabic consonant such as '日'[rì] (Duanmu, 2000).

analysis when we examine the errors that the Chinese learners make when they pronounce Korean liquid. For instance, Chinese learners pronounce the Korean flap [ɾ] as retroflex [ɻ] or dental [l] due to the free distribution of Chinese liquid's in syllable initial.4 If Chinese liquids are only categorized in terms of the manner of articulation, it can be assumed that Korean [l] and [ɾ] correspond to Chinese [l] and [ɻ] respectively. However, there is no such regularity in Chinese learner's error for the asymmetry of place between Korean [ɾ] and Chinese [ɻ].5

The Chinese learner's error in pronunciation of Korean liquid can be simply analyzed as the arbitrary application of L_1 phoneme based on the phonetic similarity from their lexicon. It is the typical pattern of error that can be found in any L_2 learners. However, such analysis cannot explain the examples that 신호철 (2003) depicted as follows.

(1) a. 아이들이   →   [aidɨlli]
        낮말은   →   [nanmallɨn]
        물었습니다   →   [mulləts'imnida, mulɨts'imnida]
        말이   →   [malli, mali]
     b. 그림   →   [kɨllim]
        흐르다   →   [hɨllida]
        코끼리   →   [kʰok'illi]
        우리   →   [ulli]

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4 The Chinese learners have somewhat trouble in distinguishing Korean [ɾ] and [l] when they pronounce the syllable initial liquid and syllable final liquid such as '바른[paɾun]' and '발[pal]' (김태경·박초롱, 2014).

5 However, the tendency of error can be assumed as follow (이화진, 2012).
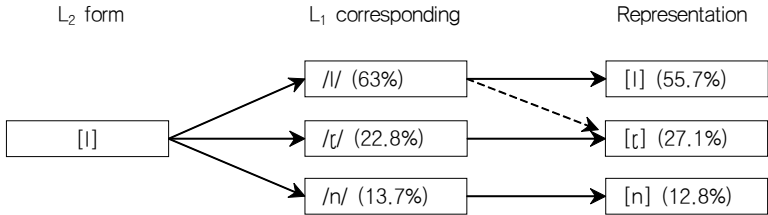
사람　　　　→　[sallam]
아리랑　　　→　[allilaŋ]
꼬부랑　　　→　[k'obullaŋ]

　　As depicted in (1a), the Chinese learner frequently pronounces Korean syllable final [l] as the sequence of [ll] in syllable boundary. In (1b), the Chinese learner alters syllable initial [ɾ] to [l] with a redundant preceding [l] that causes the sequence of [ll] in syllable boundary. According to the segmental alternation, the Chinese learner's error can be analyzed that Korean [ɾ] is replaced with [l] from the Chinese phoneme inventory. By this view, however, redundant element [l] cannot be explained.

　　In (1a), there are two cases of error '물었습니다' and '말이' that have two ill-formed representations. In terms of segmental alternation, each second representations of error can be described as below.

　　　　(2) a. [mu.ɾət.s'im.ni.da] → [mu.lət.s'im.ni.da]
　　　　　　 b. [ma.ɾi] → [ma.li]

　　There are two issues in the analysis (2). First, another ill-formed representation that has redundant [l] cannot be explained in this way. Second, considering the correlation between each representations of the error, the syllable boundary is not assumed in appropriate ways. In [mulləts'imnida] and [malli], syllable final liquid in preceding root morpheme triggers the error that blocks the representation of [ɾ]. Therefore, for the consistency of analysis, each ill-formed representation should be described as below.

(3) a. '물었습니다' /muləsʼsɨpnita/
   → [mul.lət.sʼɨm.ni.da] ~ [mul.ət.sʼɨm.ni.da]

   b. '말이' /mali/
   → [mal.li] ~ [mal.i]

This analysis shows that the Chinese learner's error in the pronunciation of Korean liquid is represented not only on the phoneme tier but also on the syllable tier. The redundant [l] and syllable final [l] as a surface form should be treated as the elements that form the process of onset linking in syllabification.[6]

III. The Property of Syllabification Causing Errors

The Korean liquid sounds are represented in two ways. First, the lateral sound occurs when the liquid position is restricted to syllable final and syllable initial preceding coda lateral.[7] Second, the flap sound occurs when the syllable initial liquid has no preceding coda consonant. In the aspect of Chinese learner's pronunciation, the flap sound error is represented frequently as the syllable final [l] or the lateral sequence [ll] in syllable boundary.

The fact that syllable onset error is represented through the syllable final consonant indicates that the cause of error is not restricted segmental alternation. If the error of syllable initial flap [ɾ] is triggered
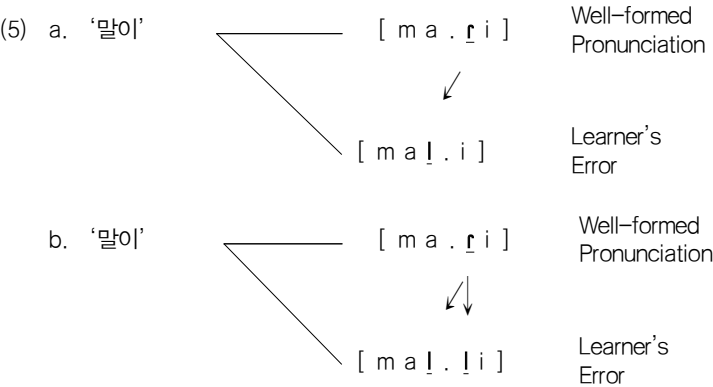
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6 On the research of Chinese learners' spontaneous speeches in our institute (2015. 2), the types of liquid pronunciation error are categorized as V.lV, Vl.V, Vl.C, V.lVl#, C.lV and Vl#. The prominent type of error represented frequently is V.lV and Vl.V. In C.lV, initial [l] is represented as surface form without the influence of syllabification. In Vl.C, on the other hand, less error has been occurred exceptionally.

7 There is another viewpoint that syllable initial lateral can occur without preceding coda lateral such as '라디오[ladio]' and '라면[lamyən]'.

by the absence of flap [ɾ] in Chinese language, it can be described as the alternation between syllable initials based on monosyllabic interaction.

(4)　'말이' ⎯⎯⎯⎯⎯ [m a . ɾ̲ i]　Well-formed Pronunciation

↓

[m a . l̲ i]　Learner's Error
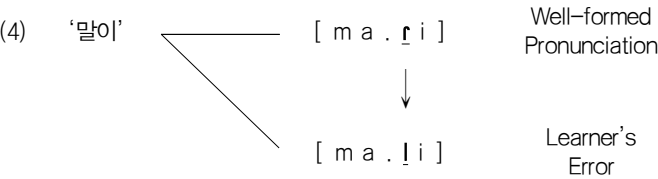
The segmental alternation such as [ɾ] to [l] in (4), is restricted to monosyllable. However, unlike the above (4), the learner's error occurs through the preceding coda lateral that cannot be placed on the following onset. It proves that the error of syllable initial flap [ɾ] is not the only result of monosyllabic interaction. As a consequence, the syllable initial flap [ɾ] is represented through two processes as follows.

(5)　a.　'말이' ⎯⎯⎯⎯⎯ [m a . ɾ̲ i]　Well-formed Pronunciation

↙

[m a l̲ . i]　Learner's Error

b.　'말이' ⎯⎯⎯⎯⎯ [m a . ɾ̲ i]　Well-formed Pronunciation

↙↓

[m a l̲ . l̲ i]　Learner's Error

In (5a,b), the errors are represented across the syllable boundary

causing the syllable final [l] and lateral sequence [ll] with the redundant [l]. It shows that the convention of syllabification in Chinese language affects the Chinese learner's error. In Korean language, the representation of syllable initial flap [ɾ] obligatory involves the onset linking rule that is applied when the syllable final consonant is represented as a surface form with following vowel. In Chinese language, on the other hand, there is no such process. Therefore, the Chinese learner has some difficulty in pronouncing Korean syllable initial flap [ɾ].

1. Blocking of Onset Linking

In terms of linguistic typology, Chinese language is labeled as the isolated language. For this aspect, the Chinese syllables are separated with exact syllable boundary with no dialectal variation (심민희, 2012). Furthermore, as Chinese language has no exact syllable sequence constraint, the phonological derivation on the syllable boundary doesn't appear frequently (윤영숙, 2014). By these aspects, there is no obligatory rule such as nasalization and lateralization as in Korean language. Although those rules are regarded as the natural process to a Korean native speaker, the Chinese learner regards those rules as unfamiliar and opaque phenomena.

One of the most general rules in Korean phonological phenomena is the onset linking rule which is applied to the onset slot of following vowel. The onset linking rule of Korean language is a sort of syllabification that forms a unmarked syllable structure.[8] It is applied naturally as below.

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[8] It is concerned with the peripheral elements of syllable tends to be linked to syllable initial position, namely the onset maximal principle.

(6) a. '살았습니다' /sal.asʼ.sip.ni.ta/ → [sa.rat.sʼim.ni.da]
    b. '들어요' /tɨl.ə.yo/ → [tɨ.rə.yo]
    c. '놀이' /nol.i/ → [no.ɾi]
    d. '발음' /pal.ɨm/ → [pa.ɾim]

In (6), every syllable initial flap [ɾ] obligatory involves the onset linking to be represented as a surface form. It means that the onset linking rule feeds the representation of syllable initial flap [ɾ] in Korean language.[9] The Chinese learner, however, cannot apply the rule on the same condition.[10] As a consequence, they derive the errors caused by the strange convention of syllabification.

(7) a. '살았습니다' /sal.asʼ.sip.ni.ta/ → [sal.at.sʼim.ni.da]
    b. '들어요' /tɨl.ə.yo/ → [tɨl.ə.yo]
    c. '놀이' /nol.i/ → [nol.i]
    d. '발음' /pal.ɨm/ → [pal.ɨm]

Chinese language has a somewhat similar syllable structure with Korean language in the sense that the syllable is mainly formed from the nucleus. In the hierarchical structure, however, Chinese syllable is differentiated from Korean language as below (엄익상, 2013).

Table 2. Syllable Structure of Chinese

Tone			
Initial	Final		
	Medial	Rhyme	
		Nucleus	Ending

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9 It is the view of generative grammar that explains the Korean [l] and [ɾ] do not contrast each other.
10 In this case, the errors appear to almost learners at the beginner level as well as some learners at the intermediate level.

Chinese language allows the maximum CGVC or CGVG in monosyllable which is similar with the Korean syllable structure. In contrast, Chinese initial C has a different position of hierarchy with final C, whereas both elements have the same position of hierarchy in Korean language. For the Chinese final C is strictly governed by the rhyme, Chinese syllable final cannot be linked to following syllable structure naturally (심민희, 2012).

When the syllable final consonant occurs with the following vowel in Korean language, the Chinese learner generally does not link the syllable final consonant to the onset position of following vowel based on their convention that does not license the coda consonant to the onset.

(8)
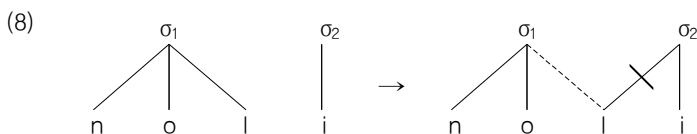
In (8), the '놀이' is pronounced as [nol.i] by the Chinese learner without the onset linking of syllable final [l]. The Chinese learner blocks the coda consonant that can be linked across the syllable boundary. For the stray [l] that is blocked remains in syllable final position, the Korean syllable initial flap [ɾ] cannot be represented as the surface form.

2. Gemination in Syllable Boundary

Another type of Korean liquid pronunciation error is the representation including the redundant [l]. It forms the lateral sequence

[ll] across the syllable boundary.[11] In the aspect of the syllabification, the redundant [l] is placed on the onset slot of following vowel.

(9) a. '살았습니다' /sal.asʼ.sip.ni.ta/ → [sal.lat.sʼim.ni.da]
    b. '들어요' /tɨl.ə.yo/ → [tɨl.lə.yo]
    c. '놀이' /nol.i/ → [nol.li]
    d. '발음' /pal.ɨm/ → [pal.lɨm]

In terms of the segmental alternation based on the phoneme inventory, the process deriving the liquid pronunciation error in (9) can be assumed in two ways. First, the syllable initial flap [ɾ] is altered to the lateral [l] and the redundant [l] is positioned to the preceding coda slot. In this assumption, however, the flap [ɾ] as a derived form is inappropriate by the absence of flap [ɾ] in Chinese language.

Second, the redundant [l] is placed on the onset slot of following vowel after the blocking of the onset linking as below.[12]

(10)
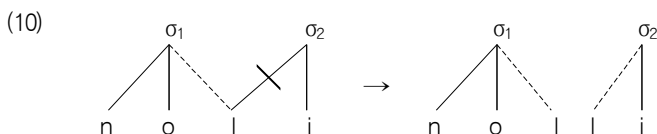
In Chinese language, there is a significant convention that copies the syllable final consonant to the onset slot of following vowel. The

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11 Except for the duration time, lateral sequence [ll] is almost the same with [l] phonetically in the syllable boundary. In the skeletal tier of Korean language, the surface [l] between preceding vowel and following vowel cannot comprise only one slot such as '다리' [taɾi] ↛ [tali]. In the case of English and Chinese, however, surface [l] in the same environment can be placed on the single slot such as 'bully[bɔli]' and '乏力 [fali]'.

12 As the pronunciation of liquid in Chinese language's convention such as '罐儿里 [kwarli]', the Chinese learners tend to pronounce the '서울이'[səuɾi] to '써울리'[sʼəulli] (범류, 2010).

Chinese null onset forms the gemination with the preceding coda consonant in weak syllable boundary (Duanmu, 2000).

(11) a. '难啊' [nan−∅a]　　　→　[nan−na]
　　 b. '忙啊' [maŋ−∅a]　　 →　[maŋ−ŋa]
　　 c. '是啊' [ʂrr−∅a]　　　→　[ʂrr−ra]
　　 d. '四啊' [sz−∅a]　　　 →　[sz−za]

　　The Chinese convention that forms gemination at the syllable boundary is correlated with the process of placing a redundant element to the onset slot of following vowel.[13] The zero onset plays a role as the empty onset slot of following vowel that can place the redundant element. It can also be described as in (12) which has the same shapes as (10).

(12)
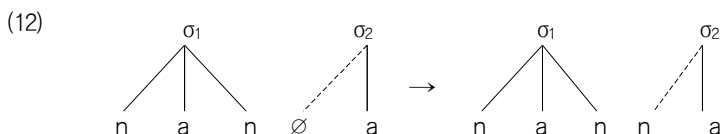
　　This analysis, however, has some remaining issues since placing a redundant element is based on segmental tier and there is no motivation in the redundant element placing as well. The errors deriving at the syllable tier should be analyzed from the viewpoint of syllable tier. Furthermore, it is not necessary to afford the new element triggering an effort and redundancy in learner's view.

　　According to Kahn (1976), the convention that forms gemination can be treated as the result of ambisyllabicity in the syllable boundary. In

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13 Under the influence of this convention, the Chinese learners frequently pronounce the Korean consonants to ill−formed geminated representation such as '아기[a.ki] → 악기[ak.ki]' and '오늘[o.nil] → 온늘[on.nil]'.

this view, the sequence of the same consonant across the syllable boundary is the ambisyllabic. In addition, it is not necessary to assume the segmental derivation such as the insertion of redundant consonant for analyzing the phenomena based on syllable tier.

Therefore, the analysis of convention forming gemination, depicted in (12), should be revised as below.

(13)

$$\sigma_1 \qquad\qquad \sigma_2$$

n   a   n   a
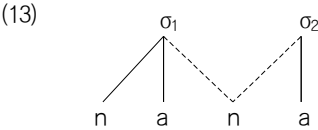
This analysis argues that the Chinese gemination in syllable boundary is triggered by ambisyllabicity. Following this analysis, the Chinese learner pronounces Korean liquid in syllable boundary through the application of ambisyllabicity. Consequently, surface gemination that has the same shapes of (13) appears as below.

(14)

$$\sigma_1 \qquad\qquad \sigma_2$$

n   o   l   i
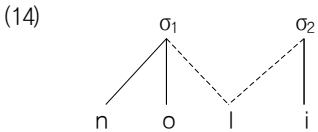
To summarize, the ill－formed Korean lateral sequence [ll] in the syllable boundary that Chinese learners pronounce as the error is concerned with the syllabification patterns of the Chinese language.

IV. Conclusion

The main purpose of this study is to analyze the patterns of Chinese learner's error in their pronunciation of Korean liquid based on a syllable tier. There are two types of error that cause '$[ɾ] \rightarrow [l]$' alternation and ill—formed [ll] in syllable boundary. This study argues that the first type of error is not only derived as segmental alternation due to Chinese phoneme inventory, but it is also treated as the phenomenon that blocks the onset linking. The second type of error is a part of the application forming the Chinese ambisyllabic gemination.

The learner's error is mainly triggered by the difference between L_1 and L_2. In the aspect of pronunciation error, the difference means not only the contrast of the phoneme inventory based on segmental tier. In this study, the difference in patterns of syllabification is regarded as a significant factor including a pronunciation error. In Chinese language, there is no convention that links coda consonant to the onset of following vowel obligatorily. In the syllable boundary, on the other hand, there is the convention that forms ambisyllabic gemination in Chinese language whereas Korean language does not. For those aspects, Chinese learner's error is caused when they pronounce the Korean liquid.

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ABSTRACT

Phonological Explanations
on the Pronunciation Errors of the Chinese Learner:

Focusing on the Korean Liquids in Syllable Boundary

Lee, Hwa Jin & Ha, Ho Bin

The main purpose of this study is to demonstrate the grounds that cause the Chinese learner's errors in Korean liquid pronunciation. The basis of analyzing pronunciation errors, in many cases, compares the phoneme inventory of target language with learner's. However, the explanation by comparison of phoneme inventory is somewhat unclear when the proper segment that is pronounced by learner causes error in syllable level such as '/nola/ → [nol.a]'.

In this study, unlike previous contrastive approaches, we assume that the crucial key which causes the Korean liquid pronunciation errors of the Chinese learner is the difference between both languages in the process of syllabification. In the case of Chinese, there is only the convention that formulates ambisyllabicity without the application of rule so-called 'onset linking' in syllable boundary. Therefore, the Chinese learner blocks the coda [l] to onset [ɾ], or applies ambisyllable [ll] to syllable boundary.

KEYWORDS contrasting phoneme inventory, segmental alternation, syllabification, gemination, onset linking, ambisyllabicity