Perception and Production of Korean /l/ by L2 learners and Implications for Teaching Refined Pronunciation

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1. Introduction[1]

It has been argued that perception always precedes production in L1 phonological acquisition. Stampe (1973) and Hale & Reiss (1998) suggested that children have approximately the same competence as adults but children fail to produce adult-like pronunciation due to immature articulators. The issue of whether a precedence relation exists between perception and production in L2 phonology has been widely debated, with all four logical possibilities being attested. The four logical possibilities for the relationship between production and perception in L2 phonology are shown in (1).

(1) a. L2 learners can both perceive and produce target contrasts.
b. L2 learners can neither perceive nor produce target contrasts.
c. L2 learners can perceive better than they produce L2 phonemes (Borden, Gerber & Milsark 1983).
d. L2 learners can produce L2 contrasts better than they can perceive them (Goto 1971, Sheldon & Strange 1982).

With regard to acquisition of English /l/ and /r/ contrasts, Borden, Gerber & Milsark (1983) have shown that Korean learners of English have better perception than production, while Goto (1971) and Sheldon & Strange (1982) claimed that Japanese learners of English can produce the contrast better than they can perceive it.

Within the context of this perception and production debate in L2 phonology, it is interesting that Flege (1987) has argued that sounds that are minimally different between the native language (NL) and target language (TL) are difficult to acquire because L2 learners do not assign them to different categories. Moreover, it has also been shown that learning to discriminate TL sounds that are allophones in the NL (an allophonic split) is difficult (Eckman et al. 2001). In Korean, [l] and [ɾ] are

[1]I am truly grateful to Fred R. Eckman for the extensive discussion and advice about this paper. I also appreciate the help of Jimi Kim in evaluating the production data. Thanks also to anonymous reviewers for helpful comments and suggestions.

allophones of /l/, with [ɾ] occurring syllable-initially and [l] syllable-finally[2]. The acquisition of Korean /l/ by American English (AE) speaking L2 learners involves a process different from making an allophonic split (which involves assigning NL allophones to separate phonemes in the TL). In this case, [ɾ] and [l] are allophones of /l/ in the TL, Korean, while in American English, /l/ is a phoneme and [ɾ] is an allophone of /t/ or /d/. Although the NL, English, has both sounds [l] and [ɾ], it is often observed that acquiring the Korean phoneme /l/ is difficult, as shown in Kim C.-W. & Park, S.-G (1995), in their investigation of the difficulty in learning Korean /l/ by Australian students[3].

The purpose of this paper is twofold. First, we report results from a preliminary study investigating the acquisition of Korean /l/ by AE native speakers. The findings support the position that one can make predictions about the difficulty involved in L2 production based on L2 learners' ability to perceive certain phonetic distinctions. The second purpose is to describe the implications of these findings for teaching pronunciation to high-level learners of Korean as a second language.

More specifically, this paper evaluates two hypotheses that are based on L2 learners' perception: (1) learners of Korean whose NL does not have [l] and [ɾ] as allophonic variants should be able to perceive the allophonic realizations of Korean /l/, and (2) AE speaking learners should be able to produce syllable final [l] more successfully, at least in the beginning stages, than [ɾ]. The rationale for (1) is that [l] and [ɾ] are phonetically different enough that learners should be able to perceive them. The rationale for 2) is that acquiring [l] is mapping a NL phoneme onto a TL allophone, whereas acquiring [ɾ] is mapping a NL allophone onto a TL allophone.

The remainder of this paper is structured as follows. First, section 2 provides the background for understanding native and target language liquids. This is followed by an outline of possible accounts for the difficulty of learning Korean /l/. Next, hypotheses on production prediction are proposed based on learners' perception abilities. The following sections describe the subjects, the methodology and the results. The discussion section deals with questions raised in the present study. Finally, some pedagogical implications derived from this study are discussed.

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[2] Iverson, G. K. and Sohn, H.-S (1994) claimed that the Korean liquid should be represented as an underspecified liquid interdeterminate /L/ underlyingly, which is neither /r/ nor /l/, in contrast to the traditional underlying form /l/. In this paper, /l/ will be used to represent the liquid phoneme.

[3] The Kim and Park study focused on intervocalic liquid acquisition by native speakers of Australian English, which does not have the flap. More detailed information is illustrated in a later section.

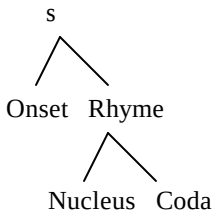
2. Background

This section introduces three important areas of the background for this paper. First, I illustrate facts about the Korean liquid and basic syllable formation. Then I provide information about AE liquids and describe of the flapping phenomenon. Lastly, I lay out four accounts that have been previously proposed to explain the L2 phonological difficulties and evaluate them regarding AE speaking learners' acquisition of the Korean /l/. I turn first to the facts about Korean, the target language in this study.

2.1. Liquids in Korean, the Target Language

As mentioned briefly in the introduction, Korean /l/, written as '? ' in Korean orthography, surfaces either as [l] syllable-finally or [ɾ] syllable-initially. Assuming that it is uncontroversial that the structure of a syllable is represented in (2), I take Korean syllable structure to be represented in (3).

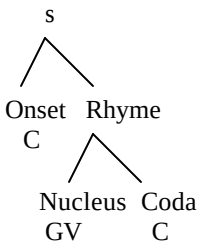
(2) Syllable Structure



(Roca and Wyn 1999:245)

Simply stated, the syllable is composed of two parts, the onset and the rhyme, with the rhyme branching into the nucleus and the coda. For example, the English word, *cat* [kæt], is analyzed first into two parts: the onset *k* and the rhyme *æt*; the rhyme is further divided into *æ*, the nucleus, and *t*, the coda. In English, the onset and the coda can be complex in that both can contain more than one consonant. In Korean, however, the maximum syllable structure is CGVC, and only a single consonant is allowed in both the onset and the coda, as shown in (3),

(3) Korean Syllable Structure [. (C) (G) V (:) (C).][4]



where . is a syllable boundary, C a consonant, G a glide or semivowel, V a vowel, and : represents vowel length. Parentheses indicate optimality in occurrence.

(Sohn 1999: 160)

Underlyingly, however, up to two consonants are allowed in the Korean coda /CGVC$_1$C$_2$/ even though only a single coda consonant can surface. If a syllable with an onset consonant follows this syllable, either C$_1$ or C$_2$ surfaces[5], but not both. Alternatively, if a vowel-initial syllable follows, both C$_1$ and C$_2$ surface, but in different positions. C$_1$ surfaces as the coda of the first syllable and C$_2$ as the onset of the following syllable. Examples are illustrated in (4) with their templates.

(4)

/CVC$_1$C$_2$/	[CVC$_1$]	
/moks/	[mok]	'share'
/CV$_1$CV$_2$ +V/	[CVC$_1$.C$_2$V]	
/moks +i/	[mok.ʃi][6]	'share + subject marker'
/CVC$_1$V$_2$/	[CVC$_2$]	
/hɨlk/	[hʔk]	'soil'
/CVC$_1$C$_2$+V/	[CVC$_1$.C$_2$V]	
/ hɨlk +i/	[hɨl.gi][7]	'soil + subject marker'

Of further importance is that in Korean, there is no underlying sequence of a C$_1$C$_2$ coda cluster, where C$_2$ is /l/ and surfaces as [ɾ]. The Korean syllabification process is schematized in (5).

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[4] Whether the glide in Korean is part of the onset or part of the nucleus is controversial among Korean phonologists. In this paper, I consider the glide part of the nucleus. See Ahn (2002: 67-71) for discussion.

[5] What triggers the realization of either C$_1$ or C$_2$ is debatable. See Ahn (200: 78-85) for discussion.

[6] In Korean, *s*-palatalization turns /s/ into [ʃ] in front of the high front vowel [i].

[7] Voiceless obstruents are voiced between sonorants.

(5) Syllabification[8] process in Korean:

a. Associate a vowel to a V slot as the head of a syllable.
b. Syllabify i*y* as one unit.
c. Assign an onset segment to the C slot preceding the V slot.
d. Associate an unsyllabified segment to the coda C slot.

(Ahn 2002: 67)

This syllabification process is exemplified by the sequence /CVC.V/ becoming syllabified as [CV.CV] and /CVC.CV/ as [CVC.CV].

To summarize, how the positionally-conditioned variants of /l/ are realized on the surface depends on (1) the position of /l/ within a syllable, such as whether it is syllable-initial or syllable-final, and (2) whether the syllable containing /l/ is followed by another syllable beginning with either a consonant or a vowel. For example, /l/ surfaces as [ɾ] in the onset as shown in (6a) and the syllable-final /l/ followed by a syllable beginning with a vowel surfaces as [ɾ] in the onset of the following syllable as in (6b), otherwise /l/ surfaces as [l] as in (6c).

(6)	a. ? ?	/pa.lo/	[pa.ɾo]	'properly, correctly'
	b. ? ?	/mul.e/	[mu.ɾe]	'at/in the water, '
	c. ? ?	/kal.bi/	[kal.bi]	'Korean barbequed ribs'

Therefore, unless L2 learners know how Korean words are syllabified, it is difficult to produce correct pronunciations of positionally-conditioned /l/ in Korean.

The next section discusses liquids and flaps in American English, which is the native language (NL) of the subjects in this study.

2.2. Liquids and Flaps in American English, the Native Language

American English has two liquid phonemes, lateral /l/and central /r/. The lateral liquid /l/ has two variants, a dark [ɬ] and a light [l]; a dark [ɬ], which is velarized, occurs in codas, both before consonants as in *milk* and as a singleton as in *fell*; light [l] occurs syllable initially as in *lip* (Ladefoged 2001:55). Light [l] is one of allophones of Korean /l/, which is realized in syllable codas. AE *r*, on the other hand, is a retroflex made with the tongue tip curled back.

An additional feature of AE that is relevant to this study is the flapping of intervocalic /t/ and /d/ to the alveolar flap [ɾ]. This flap is the other variant of Korean /l/, which occurs syllable-initially. However, in AE, [ɾ] does not have phonemic status, as it is an allophone of [t] and [d].

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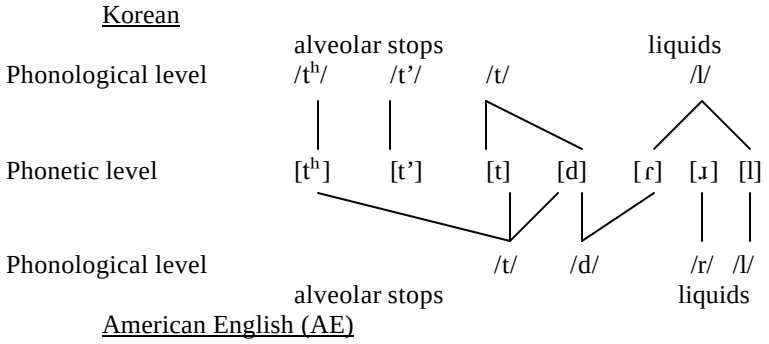
[8] In this paper, syllabification and liaison are used interchangeably.

The question naturally arises as to whether Korean flaps are the same acoustically as AE flaps. Idsardi and Sung (2003) demonstrated that flaps in Korean and AE are very similar phonetically in their production, showing that there are no statistically significant differences in closure duration and voicing. In the perception test, however, AE speakers showed some difficulty in discriminating the pair [ɾ-d] in both AE and Korean stimuli. Similarly, Korean speakers made errors in discriminating the [l-r] pair. On the other hand, AE speakers showed a high sensitivity to the [ɾ-l] pair in both AE and Korean stimuli. This is exactly what one of the hypotheses of the present study would predict, that AE speakers are able to perceive the difference between Korean [ɾ] and [l]. Moreover, it was reported that AE speakers categorized the flaps as alveolar stops, while Korean speakers categorized the flaps as liquids; this is presumably due to NL influence. A question arises here as to why it is difficult to learn Korean /l/, given the assumption that perception is a prerequisite for production (Flege 1992). AE speakers have no difficulty discriminating [ɾ] from [l].

In summary, what makes the difficulty associated with the acquisition of Korean /l/ by AE speakers interesting is the fact that AE has both [l] and [ɾ], and these two sounds are allophonic variants of Korean /l/. Figure (7), adapted from Idsardi and Sung (2003), summarizes the relationship between flaps, alveolar stops, and glides in Korean and AE.

(7) Phonological status of flaps, alveolar stops, and liquids in Korean and AE



(Idsardi and Sung 2003: 188)

Having described the distribution of liquids in the NL and TL, I turn next to the discussion of some possible accounts from previous studies of the difficulty in producing Korean /l/.

2.3. Pronunciation of Korean /l/ by AE Native Speakers: Difficulties and Errors

There are four accounts, of which I am aware, that have been previously proposed to explain L2 phonological difficulties involving allophones, in general, or the acquisition of Korean /l/, in particular: (1) the account of allophonic splits; 2) L1 transfer; (3) Korean /l/ being infrequent in the input; and (4) strategies used in learning Korean orthography, *Hangul*. The first account above was proposed by Eckman & Iverson (1994, 1997) using the principle of Structure Preservation and the Derived Environment constraint (Kiparsky 1973) in order to explain the pronunciation difficulty of native speakers of Korean and Spanish in learning the English contrasts between /s/ and /ʃ/ and between /d/ and /ð/, respectively. The last three of the above proposals, on the other hand, were put forth by Kim and Park (1995) to explain Australian English speakers' difficulty producing the allophones of Korean /l/. In the remainder of this section, I will discuss these proposals, and in each case, I argue that the proposed account cannot explain the difficulty surrounding the acquisition of the variants of Korean /l/ by native speakers of AE.

In the first example, the allophonic split discussed by Eckman & Iverson (1994, 1997) addressed the difficulty of L2 learners assigning two NL allophones to separate phonemic categories in the TL. In the case at hand, [l] and [ɾ] are not allophones of the same phoneme in AE, but are assigned to different phonemes, [l] to /l/ and [ɾ] to /t/ or /d/.

In the three proposals by Kim, C.-W. & Park, S.-G (1995), only two, L1 transfer and the frequency of Korean /l/ in the input, are supported with evidence; the other, learner strategies, is offered as speculation. The study by Kim and Park looked at native speakers of AUE learning Korean. This proposal is not pertinent to the acquisition of Korean /l/ by native speakers of AE, because the grammar of AUE does not contain the rule of flapping[9], while the grammar of AE does. Finally, the proposal involving input frequency is specific to the text used by Kim and Park's subjects. Since the subjects in the present study used a different text, the question of the frequency of Korean /l/ in the input must be left open.

In summary, among the four previously proposed accounts, two of them are inapplicable to this study, and the other two have yet to be tested empirically. The next section presents the hypotheses of this study.

[9] It is often observed that native speakers of AE pronounce /ʔti/ ? [ʔdi] 'where ? ? ' as [ʔɾi] as a result of the AE flapping rule being erroneously applied to the Korean phoneme /t/.

3. Hypotheses

The hypotheses underlying this study are shown in (8).

(8) Hypotheses

(a) AE speaking learners of Korean will be able to perceive the allophonic realizations of Korean /l/, though they may not necessarily be able to produce them.

(b) Syllable final [l] will be produced more accurately than syllable-initial [ɾ].

The rationale for the above hypotheses is as follows. First, if the learners' native language does not have [l] and [ɾ] as allophonic variations, the claim is that the phonetic difference between [l] and [ɾ] is distinctive enough that the learners are able to perceive the difference between them. Second, it is claimed that it is easier to map a NL phoneme onto a TL allophone than it is to map a NL allophone onto a TL allophone. The reasoning here is that NL allophones are not generally perceived by native speakers because they are not part of the lexical representation.

Moreover, it has already been demonstrated in previous studies, e.g. Idsardi and Sung (2003) and Kim and Park (1995), that AE and AUE speakers are capable of discriminating TL allophonic variants, in particular, Korean [ɾ] and [l]. In addition, Idsardi and Sung also showed that the L1 influences the perceptual patterns of the same sounds by different native language groups, namely, Korean and English. Kim and Park, moreover, accounted for the pronunciation problems of AUE speakers not only with NL and TL differences but also with the frequency of input and learning strategies of the learners.

In this study, which is described in the next section, data from both perception and production studies were gathered.

4. The Present Study

4.1. Subjects

A total of fourteen subjects participated in the perception test. All subjects had taken two semesters of Korean. Classes met five hours per week each of the fifteen-week semesters at the University of Wisconsin-Milwaukee (UWM). The subjects are native speakers of AE. Three of the subjects are also heritage speakers of Hmong, and two are Korean Americans, who do not speak Korean, but hear the language spoken at home. The subjects, eight males and six females, ranged in age from eighteen to twenty-eight years old.

A total of five subjects participated in the production test; three of these five subjects participated in the perception test as well. All subjects who took part in the

production test are also native speakers of AE, and had taken the same two semesters of Korean language courses at UWM. Of the subjects who took part in the production test, one was ethnically Hmong and one had studied Korean in Korea for three months. The range of ages of participants in the production test is eighteen to twenty-five years old. All the subjects for the production test were male.

4.2. Methodology

As stated above, the experiment consisted of both a perception and a production test. In the perception test, the subjects were presented with spoken forms of Korean words[10] containing /l/ in different positions, and were asked to transcribe the words using English orthography. The purpose of this task was to verify whether the subjects perceived the allophones, as Korean orthography does not show allophonic variants. Each word was repeated three times. A total of thirty-one words were to be transcribed by the subjects, twenty-one words containing /l/ and ten containing non-/l/ sounds (as distracters). It took about fifteen minutes to complete the test. If the subjects transcribe /l/ differently according to position, this would support the claim that they can discriminate the two allophonic variations of the phoneme.

For the production test, subjects were asked to read the same list of words, but presented in reverse order, into a tape recorder. Each word was read twice. The production test took place five weeks after the perception test. The production test took about ten minutes to complete, and none of the subjects had any difficulty understanding the procedure of the experiment.

5. Results

5.1. Perception Test

The results will be presented with respect to each of the hypotheses in (8). The data from the perception test are shown in Table 1 below, and confirm that most of the subjects were able to discriminate the allophonic variants of Korean /l/. A total of twenty-one words consisting of twenty-four tokens of /l/ variants, either syllable-final [l] or syllable-initial [ɾ], were transcribed by the subjects using English orthography. Table 1 illustrates which English orthographic symbol was used for each token. Thirteen of the fourteen subjects systematically transcribed the different pronunciations of Korean /l/ as distinct from each other. Only S8 (subject eight) transcribed both variants as /l/.

[10] The list that was used in the perception test consisted of words that were both familiar and new to the participants. The recorder is a native Korean speaker.

Table 1. Results of the perception test using English orthography

	Syllable-final	Frequency	Syllable-initial	Frequency
S1	l	100%	r	100%
S2	r	18%	r	99.93%
	l	82%	d	0.07%
S3	r	27%	r	100%
	l	73%		
S4	l	100%	d	100%
S5	l	100%	d	7.7%
			r	92.3%
S6	l	100%	d	7.7%
			r	92.3%
S7	rl	90.9%	d	23%
	l	9.1%	r	46.2%
			l	30.8%
S8	l	100%	l	100%
S9	l	81.8%	d	15.4%
	r	18.2%	r	84.6%
S10	l	100%	l	46.2%
			r	53.9%
S11	l	100%	r	100%
S12	l	100%	r	100%
S13	l	100%	d	38.5%
			r	61.5%
S14	l	100%	r	100%

The symbol that was used the most for transcribing syllable-final /l/ was *l*. Either *d* or *r* was chosen for syllable-initial /l/. Subjects 2, 3, 7, and 9 also used *r* or *rl* along with *l* to transcribe syllable-final /l/, but the frequency of using these symbols was remarkably low compared to use of the /l/. Subjects 1, 4, 11, and 14 used a single symbol 100% of the time in transcribing each syllable-final and syllable-initial variant such as *l* and *r* or *l* and *d*.

These findings accord with those of Kim and Park (1995), who also reported that some AUE subjects transcribed syllable-initial /l/ as either *r* or *d*.

Interestingly, eight subjects left spaces between syllables when transcribing the words, and some of these eight subjects consistently transcribed the words based on the position of the /l/, although they transcribed some words without syllabification. This shows the subjects' sensitivity to syllables.

The results of the production test are presented in the next section.

5.2. Production Test

The production test, which was administered five weeks after the perception test, required the subjects to produce the same words used in the perception test, but in reverse order. The test consisted of a total of twenty-four tokens of words containing the different variants of Korean /l/. More specifically, the words were of four types: those containing (1) syllable- final [l]; (2) syllabified [ɾ], as in [ma.ɾi] (underlyingly /mal.i/); (3) unsyllabified, syllable-initial [ɾ] such as [pa.ɾo], and (4) geminate [ll] as in [kil.l?.yo]. The speech production of each subject was evaluated by two native Korean speakers for inter-rater reliability. The inter-rater reliability was 88 percent, which was considered to be satisfactory.

The data from the production test were evaluated using a method similar to that of Kim and Park (1995), though there are some differences. In the present study, speech production was evaluated not only according to the percentage of production that was correct, but also according to the types of errors produced. The raters were asked to do two things: (1) state whether the subjects' productions were correct, and (2) check the given protocol, which listed all the possible errors. Table 2 summarizes the results of the production test. In Table 2, total correct response consists of correct production of both syllable-final [l] and syllable-initial [ɾ]. For example, S1 produced twenty-four tokens of Korean /l/, 11.4% of which were produced correctly. Of this 11.4%, 75% were produced correctly for syllable-final [l], and 25% correctly for syllable-initial [ɾ].

Table 2. Results of the correct production of syllable-final and syllable-initial /l/

	Correct production		
Subjects	Total	Syllable-final [l]	Syllable-initial [ɾ]
S1	11.4%	75%	25%
S2	45.8%	55%	45%
S3	25%	83%	17%
S4	25%	83%	17%
S5	50%	42%	58%
M (mean)	31.4%	67.6%	46.4%

As shown in Table 2, except for S5, the other four subjects, S1, S2, S3, and S4, performed better in producing syllable-final /l/ than in producing syllable-initial /l/.

I will now examine what kinds of errors were found. 36.7% of the errors were a combination of two error types, such as no liaison and the production of dark [ɬ], as in [paɬ.a.s?] for [pa.ɾa.s?] ' selling'. This error type is shown as (a) +(b) in Table 3. Table 3 summarizes all of the error types.

Table 3. Types of errors from the production test[11]

	Types of errors by percentage						
Subjects	No liaison (a)	dark [ɬ] for [l] (b)	[ɹ] for [l] (c)	[ɹ] for [ɾ] (d)	(a)+(b)	(a)+(c)	Deletion
S1	18.2 %	36.4%	18.2%	9%	9.1%	9.1%	0%
S2	0 %	42.9%	0%	35.7%	14.3%	7.1%	0%
S3	0 %	22.2%	0%	22.2%	16.7%	38.9%	0%
S4	0 %	20%	0%	25%	50%	5%	0%
S5	8.3 %	41.7%	0%	8.3%	33.3%	0%	8.3%
M(mean)	5.3%	32.6%	3.6%	20%	24.7%	12%	1.7%

Table 3 shows that the most frequent errors were substituting dark [ɬ] for syllable-final light [l], which occurred 32.6% of the time. The second most frequently occurring error was a combination of no liaison/syllabification and substituting dark [ɬ] for syllable final light [l] (24.7% of the time). The third most frequent error was producing [ɹ] for syllable-initial flap. There were no errors that involved replacing the syllable-initial flap with [l]. This indicates that learners replaced flap with [ɹ] instead of with [l]. The high occurrence of the liaison errors coupled with other errors accords with the findings of Kim & Park (1995).

6. Discussion

In this section, I will discuss the results of the perception and production tests as they bear on the two hypotheses, considering first hypothesis (8a). The section concludes with a discussion of the acquisition of L2 sounds in general.

Hypothesis (8a) claims that L2 learners will not have difficulty perceiving the two variants of Korean /l/, the flap [ɾ] and the light *l*, [l]. The results from the perception test support (8a), as all of the subjects (except for S8[12]) transcribed the two allophonic variants consistently with different symbols. Nine of the fourteen subjects (S1, S2, S4, S5, S6, S9, S11, S12, and S14) consistently used one symbol for each variant over 80% of the time, while S3, S7, S10, and S13 did not, although they still used different symbols for each variant. For example, S3 used both *r* and *l*, 27% and 73% of the time, respectively, for syllable-final /l/. S3 used *r* 100% of the time for syllable-initial /l/, which shows that S3 distinguished between the two variants by using *l* most of the time for the syllable-final /l/ and *r* for syllable-initial /l/.

[11] An example of the error type (a)+(c) is [kaɹa.s?] for [ka.ɾa.s?].

[12] Only S8 transcribed both variations as /l/, presumably, visualizing the words in Korean orthography before transcribing them into English.

The results of the production test also support the second hypothesis, i.e., that the production of [l] would be more successful than the production of [ɾ]. The mean for the correct production of syllable-final /l/ was 67.6 %, while the mean for the correct production of syllable-initial /l/ was 46.4%.

Except for S5, all subjects performed better on syllable-final [l] than they did on syllable-initial [ɾ]. One reason why S5 was better at producing [ɾ] than other subjects might be that S5 studied abroad for three months in Korea. Moreover, S2, who showed better production on the flap [ɾ] than S1 and S3, had previously studied Japanese as a second language. Japanese also has the flap [ɾ] as an allophone of the liquid.

Although AE has the flap [ɾ], unlike AUE, and further, despite the fact that native speakers of both AE and AUE are able to perceive the difference between [l] and [ɾ], the production test shows that AE native speakers experience the same level of difficulty in producing variants of Korean /l/ as do native speakers of AUE. This is interesting because one would expect that the AE learners would not, given the existence of [ɾ] in AE.

What puzzled Kim and Park (1995) was why AUE speakers could not produce the allophonic variants of Korean /l/ when the subjects do not have a problem in perceiving them. It is widely held that perception precedes production (Flege 1995), or at least that perception is a prerequisite to successful production in L2. This view is clearly stated in Kim and Park's discussion, as seen below.

> The crucial point emerging from the analysis of the 3 tests[13] results is that, …….the acquisition of the Korean flapping rule had not occurred…….. there may be some sort of process which blocked the learning of the flapping rule……the important question is, then, is why the subjects in Group I (experienced group), who perceptually distinguished the two Korean liquid allophones perfectly well, failed to acquire and generate the Korean flap sound at the production level.
>
> (Kim and Park 1995:192-193)

Based on the results of the current study, it seems that AE native speakers' failure to acquire Korean /l/ can be attributed to their failure to perceive the allophone [ɾ] in the NL. They would then also be unable to map it onto the TL allophone. Moreover, as shown in the production test, Korean liaison (syllabification) plays a significant role in determining the positionally-sensitive allophonic realizations of Korean /l/. Even though AE learners may be able to produce flaps in isolation, if they do not master liaison, they cannot correctly produce Korean allophones of /l/, at least consistently.

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[13] They are reading, listening, and repetition tests.

Three types of learning of L2 sounds have been previously studied: (1) leaming novel L2 sounds that do not exist in NL, (2) learning sounds that are phonemes in the TL but allophones in the NL, and (3) learning L2 sounds that are minimally different from sounds in NL. Acquisition of Korean /l/ by AUE speakers falls into the first type of learning, in which the new sound, flap [ɾ], that does not exist in AUE, must be learned. The case of learning Korean /l/ by AE native speakers does not fall into any of the above types, as this is a case of mapping an NL allophone onto a TL allophone, or in other words, assigning two allophones of separate phonemes in the NL to the allophones of the same phoneme in the TL.

Four types of learning L2 sounds, including mapping NL allophones onto TL allophones, are illustrated in (9) along with examp les of each.

(9) Types of learning L2 sounds

a. Learning novel L2 sounds,
   e.g. learning intervocalic Korean /l/ by AUE native speakers (Kim and Park 1985);
b. Learning sounds that are phonemes in the TL but allophones in the NL,
   e.g. learning the English /ʃ/ and /s/ contrast by Korean native speakers (Eckman et al. 1994);
c. Learning sounds that are minimally different from sounds in the NL,
   e.g. learning English /p, t, k/ by French native speakers (Flege 1987)[14];
d. Learning sounds that are allophones in both the NL and TL,
   e.g. learning syllable-initial /l/ (i.e. [ɾ]) in Korean by AE native speakers.

The present study deals with the acquisition of an L2 sound that exists as an allophone both in the NL and in the TL. In learning Korean, native speakers of AE have to learn to suppress the realization of the flap in the intervocalic position as an allophone of /t/, and also to learn to produce this flap as an allophone of the Korean /l/ only in syllable-initial positions.

Of the four types of leaming in (9), Flege (1987) has argued that type *c* presents greater difficulty than type *a*. It is, however, an open and empirical question whether type *d* is more difficult than type *b* for L2 learners. The present study does not address this question, but simply shows that type *d* presents difficulty for L2 learners.

In the following section, I turn to the pedagogical implications of these findings.

7. Pedagogical Implications

L2 acquisition is a dynamic of many processes, often occurring simultaneously. It is difficult to pinpoint exactly what processes are involved in any specific type of

[14] French stops are unaspirated with short-lag VOT (voice onset time).

learning. Besides factors that are internal to the L2 learner, which has been the view taken in this paper regarding the acquisition of Korean /l/, there are many external factors involved, the most influential being the input to which the learner is exposed. Among the different kinds of input, institutional instruction is arguably the simplest and most accessible type for the majority of L2 learners.

In this section, I suggest two pedagogical implications derived from this study, both of which concern Korean allophones, and both of which concern input. The first implication involves the perception of the allophonic variants by the instructors of Korean. The question that arises is whether instructors are aware of this allophonic variation, since allophones are not readily perceived by native speakers of the language.

The other implication involves explicit instruction regarding Korean orthography. As allophonic variation is not reflected in *Hangeul*, learners must be explicitly taught the positionally-conditioned variants of the phonemes.

The importance of practice, however, has been disregarded over the past two decades due to influence from the Natural Approach (Krashen and Terrell 1983). On the other hand, Larsen-Freeman (2003) still emphasizes the importance of meaningful practice as a method of enhancing the learner's automaticity through reconstructing and recognizing underlying representations. In addition, the skill-building theory of SLA argues that 'learned' knowledge can be converted into 'acquired' knowledge (Ellis, R. 1997:55). This view runs contrary to Krashen's claims that consciously 'learned' knowledge is independent from subconsciously-developed 'acquired' knowledge. Accordingly, the challenge to instructors is to make the practice meaningful in order to increase the chances that 'learned' knowledge might become 'acquired' knowledge. So-called 'noticing' (Schmit and Frota 1986), which refers to the process of conscious attention to linguistic features of TL input, have shown that conscious awareness of input can actually aid in the learning process. However, mastering Korean liquids might seem trivial to instructors within the entire context of second language acquisition, and therefore most instructors would rather focus on larger units of acquisition, such as phrases and sentences. Nevertheless, the acquisition of Korean /l/ has been observed as one of the biggest pronunciation problems that AE learners of Korean have. In order to achieve high-level competence in L2, the importance of phonology cannot be ignored.

In summary, two sorts of awareness are necessary for effective acquisition of Korean /l/: (1) the instructors' awareness of both the allophonic variation of the liquid and the existence of variants in the learners' NL, and (2) the learners' awareness of allophonic variation of sound segments in both NL and TL.

8. Conclusion

This study has attempted to explain second language learners' pronunciation difficulties with the Korean phoneme /l/, and has suggested pedagogical implications based on the findings. Although this is a pilot study, and the production test was relatively smaller than the perception test, the preliminary results confirm that AE native speakers learning Korean have problems producing the allophones of Korean /l/, more so in the syllable-initial than in the syllable-final position. Kim and Park (1995)'s negative transfer account for the pronunciation difficulty by the AUE native speakers of learning Korean fails to explain the difficulty that AE speakers experience because, unlike AUE, AE has the flap, which is an allophone of the Korean /l/ in syllable initial position.

Furthermore, the pedagogical solution suggested by Kim and Park, namely, having the learners be exposed to larger numbers of tokens of liquid allophones from the early stages of learning awaits to be supported through empirical testing. The development of truly helpful teaching materials for learning the allophonic variations of Korean /l/ is needed in the near future to raise the consciousness of high-level learners about allophones, and to aid in improving their production of them.

Finally, the difficulty AE native speakers have may be attributable to their failure to: (1) perceive NL allophonic [ɾ] as different from the phonemes /t/ or /d/, (2) suppress flapping /t/ in the TL, (3) be conscious of positional variants of the liquid, either syllable-finally or syllable-initially through syllabification, and (4) produce the flap as an allophone of /l/ in syllable initial positions in the TL, which involves mapping NL allophones onto TL allophones.

References

Ahn, S-C. (2002). *An Introduction to Korean phonology*. Manuscript for revised edition.

Borden, G., Gerber, A. & G. Milsark (1983). Production and perception of the /r/-/l/ contrast in Korean adults learning English. *Language Learning*, 33(3), 499-526.

Eckman, F., A. Elreyes, & G. Iverson. (2001). Allophonic splits in interlanguage phonology: the question of learnability, *Perspectives on Interlanguage Phonetics and Phonology, inaugural issue of International Journal of English Studies* 1,21-51.

Eckman, F. & G. Iverson. (1997). Structure preservation in interlanguage phonology. In S. J. Hannahs & M. Young-Scholten (Eds.), *Current issues in the acquisition of phonology* (pp 183-208). Amsterdam: John Benjamins.

Ellis, R. (1997). *Second Language Acquisition*. Oxford: Oxford University Press.

Flege, J. E. (1987). The production of "new" and "similar" phones in a foreign language: evidence for the effect of equivalence classification. *Journal of Phonetics*, 15, 47-65.

Flege, J. E. (1995). Second-language speech Learning: theory, findings, and problems. In W. Strange (Ed.), *Speech Perception and Linguistic Experience: Issues in Cross-language research* (pp. 229-273). Timonium, MD: York Press

Goto, H. (1971). Auditory perception by normal Japanese adults of the sounds "l" and "r" ', *Neuropsychologia* 9, 317-323.

Hale, M & C. Reiss. (1988). Formal and empirical arguments concerning phonological acquisition, *Linguistic Inquiry* 29, 656-683.

Idsard, W. & Sung, E.-K. (2003). Flaps in American English and Korean: an acoustic and perceptual Study. *Generative Grammar in a Broader Perspective. Proceedings of the 4th GLOW in Asia*. (pp. 187 - 208). Seoul: Hankook.

Iverson, G. & Sohn, H.-S. (1994). Liquid representation in Korean. In Y.-K. Kim-Renaud (Ed.), *Theoretical Issues in Korean Linguistics* (pp.79-100). Stanford University: Center for the Study of Language and Information.

Kim, C. -W. & Park, S. -G. (1995). Pronunciation problems of Australian students learning Korean: intervocalic liquid consonants. *Australian Review of Applied Linguistics*, supplement 12, 183-202.

Kiparsky, P. (1973). Abstractness, opacity, and global rules. In O. Fujinura (Ed.), *Three dimensions of Linguistics Theory* (pp. 57-86). Tokyo: TEC.

Krashen, S. D. & T. D. Terrell. (1983). *The natural approach: Language acquisition in the classroom.* Hayward, CA: Alemany Press.

Larsen-Freeman, D. (2003). *Teaching Language: From Grammar to Grammaring*. Boston: Thomson/Heinle Publishing Company.

Roca, I.& W. Johnson. (1997). *A course in Phonology*. Oxford: Blackwell Publishers.

Schmidt, R. & S. Frota. (1996). Developing basic conversational ability in a second language: a case-study of an adult learner. In R. Day (Ed.), *Talking to Learn: Conversation in Second Language Acquisition*. Newbury House.

Sheldon, A. & W. Strange. (1982). The acquisition of /r/ and /l/ by Japanese learners of English: evidence that speech production can precede speech perception. *Applied Psycholinguistics*, 3, 243-261.

Sohn, H. (1999). *The Korean Language*. Cambridge: Cambridge Univ. Press.

Stampe, D. (1973). *A Dissertation in Natural Phonology*. New York: Garland.