Teaching English Consonant Clusters for Korean EFL Learners

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Abstract

English has a relatively wide configuration of consonant clusters (CC) whereas Korean does not allow either initial or final consonant clusters. Also, English has its own syllable structure and syllable constraints which are drastically different from those of Korean. As a result, English CCs often present a severe challenge for Korean EFL learners. With an effort to have general understanding about English CCs and teach them effectively to Korean EFL learners, this paper discusses English syllable structure, English CCs and structural constraints, consonant simplification strategies of native speakers, Korean syllable structure, Korean phonological processes of CCs, error analysis of Korean EFL learners’ CC Pronunciation, and implications for teaching CCs to Korean EFL learners.

Keywords: consonant cluster, cluster reduction, resyllabification, onset, coda
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English has a relatively wide configuration of consonant clusters (CC) whereas Korean does not allow either initial or final consonant clusters. Also, English has its own syllable structure and syllable constraints which are drastically different from those of Korean. As a result, English CCs often present a severe challenge for Korean EFL learners. Teachers who teach English pronunciation at Korean EFL classrooms need to get ready for an explicit explanation about English syllable structure, its structural constraints, and the consonant simplification strategies of native speakers.

With an effort to have general understanding about English CCs and teach them effectively to Korean EFL learners, the following will be discussed in this paper: English syllable structure, English CCs and structural constraints, consonant simplification strategies of native speakers, Korean syllable structure, Korean phonological processes of CCs, error analysis of Korean EFL learners’ CC Pronunciation, and implications for teaching CCs to Korean EFL learners.

**English Syllable Structure**

Korean EFL learners, like many other EFL/ESL learners, have pronunciation problems, and many of them derive from their inability to produce the different syllable types of English. Also, concerning the consonant pronunciation problems, consonants are greatly affected by their position in a word or syllable. A consideration of English syllable structure and how they differ from that of the Korean language will help in understanding these difficulties. Some examples of the syllable types of English are provided below:

<table>
<thead>
<tr>
<th>Word</th>
<th>Transcription</th>
<th>Syllable type</th>
</tr>
</thead>
<tbody>
<tr>
<td>tea</td>
<td>[t̂iy]</td>
<td>CV (Consonant+Vowel)</td>
</tr>
</tbody>
</table>
The word, *tea* has a CV syllable, the most common syllable type among the languages of the world. This is called as an open syllable because it ends with a vowel. The word, *take* has a CVC syllable, also common among the languages of the world. This is called as a closed syllable because it ends with a consonant. The word, *steak* has a CCVC syllable and begins with the consonant cluster /st/. The word, *stakes* has a CCVCC syllable with consonant clusters at the beginning and the end. A consonant cluster at the beginning of a word is called an initial cluster and a consonant cluster at the end of a word is called a final cluster. As Celce-Murcia, Brinton and Goodwin (2010) explain, “English has a distinct propensity for consonant clustering, in which two or more consonants occur in sequence in syllable-initial or syllable-final position (p. 99).” The word, *sprinkled*, which has a CCCVCCCCC syllable, shows that English can have three initial consonants and four final consonants maximally.

**English Consonant Clusters and Structural Constraints**

Schreier (2005) explains that “the majority of the world’s languages do not permit clusters of consonants in syllable-initial or –coda position; clusters are, among others, found in Germanic, Slavic and some West African languages (p. 33).” Schreier (2005) continues that even if languages like English admit initial and final CCs, they do not exploit the full range of potentially possible combinations of consonantal segments. “The structural constraints that underlie cluster formation vary according to the phonotactic systems of individual languages; they are language specific (Schreier, 2005, p. 33).” Accordingly, EFL teachers who teach Korean
EFL learners need to understand and teach English structural constraints comparing them with those of Korean in order to help Korean EFL learners solve their pronunciation problems.

Celce-Murcia et al. (2010) explains English structural constraints briefly as follows:

With clusters of two [in word-initial position], either the first sound is /s/ or the second one is an approximant (/l/, /r/, /w/, or /y/); in some instances both conditions hold (e.g. snake, speak, sky, play, pray, quite, hue, pure, slow, or swift). With initial clusters of three consonants, the first sound is always /s/, the second sound is a voiceless stop (i.e., /p, t, k/), and the third sound is one of the four approximants (e.g. splash, strong, square, or skew). In final position there are many more constraints than in initial position. These clusters can consist of two, three, or even four consonants. Many clusters of two or three and virtually all clusters of four are the result of adding a plural /s, z/ or past tense /t, d/ inflection to a stem ending in two or three consonants. (Celce-Murcia et al., 2010, p. 99)

**Consonant Simplification Strategies of Native Speakers**

Even for native speakers, it is not always easy to pronounce two or more consonants together. As a result, they employ certain strategies to make CCs easier to pronounce. English learners should be made aware that there are acceptable strategies used by native speakers to simplify CCs in certain systematic ways and EFL teachers should teach these rules explicitly so that EFL learners also can employ them. There are two consonant simplification strategies of native speakers provided by Rogerson-Revell (2011) and Celce-Murcia et al. (2010). One strategy is named cluster reduction and the other is named resyllabification by Celce-Murcia et al. (2010).

Cluster reduction strategy mentioned by Celce-Murcia et al. (2010) corresponds to Rogerson-Revell’s (2011) loss of medial consonant in clusters of three consonants. Rogerson-
Revell (2011) explains that “native speakers typically simplify complex consonant clusters, generally by eliding the middle consonant (typically /t/ or /d/) in a cluster of three (p. 166).”

- acts /ækts/ → [æks]
- scripts /skripts/ → [skrips]
- fifths /fɪfθs/ → [fɪfs]
- next week /nekstwi:k/ → [nekswi:k]

The other simplification strategy provided by Celce-Murcia et al. (2010) is resyllabification and it corresponds to Rogerson-Revell’s (2011) consonant-to-vowel linking. Rogerson-Revell (2011, p. 169) explains that “when a word ends in a consonant and the following word starts with a vowel, the consonant is ‘attracted’ to the beginning of the next word (e.g. ‘turn it on’- ‘tur ni ton’)” because this is consistent with universal syllable structure patterns.

**Korean Syllable Structure**

The pronunciation problems of Korean native speakers can be quite severe because of the radical differences between the sound system of Korean and English. The difference is mainly derived from the fact that Korean has few word-final consonants and lacks both initial and final CCs, even though Korean offers a number of consonantal contact situations within a word. To understand the pronunciation problems of Korean speakers, EFL/ESL teachers need to know how a Korean syllable is constructed.

Korean syllables can be represented as (C)V(C), while it can expand CGVC maximally, because the glide (G) in CGVC is part of the nucleus (Lee, 2010; Kabak & Idsardi, 2007). No consonant cluster is allowed in the onset nor in the coda of the syllable structure in Korean.

According to Kang (as cited in Lee, 2010), a three-step procedure is taken to make up a syllable in Korean. First, a vowel alone or a vowel plus a glide forms the core (nucleus) of a syllable (Step 1). Second, a consonant preceding the syllable core attaches to the initial syllabic
position (Step 2). Third, another consonant following the syllable core attaches to the final syllabic position (Step 3).

Lee (2010) explains that in these procedures, it is important to notice that step 2 precedes step 3, which means that Korean syllable structure has a left-branching hierarchical structure. For example, if a consonant appears between two nuclei, it is not realized as a coda of the first nucleus, but attaches to the second nucleus as an onset. This left-branching structure of a Korean syllable is contrary to that of an English syllable, which has a right-branching structure.

**Korean Phonological Processes of Consonant Clusters in Coda**

Kang’s (as cited in Lee, 2010) three-step procedure of how phonemes make up a syllable in Korean shows that the coda, compared to the onset, poses more restrictions on a Korean syllabic structure. As shown in Table 1, there are 19 consonantal phonemes in Korean, but only seven phonemes (i.e., [p, t, k, m, n, η, l]) can be used as codas.

**Table 1**

*Consonantal Inventory of Korean*

<table>
<thead>
<tr>
<th>Manner of Articulation</th>
<th>Place of articulation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Labial</td>
</tr>
<tr>
<td>Plosives</td>
<td></td>
</tr>
<tr>
<td>Plain</td>
<td>p</td>
</tr>
<tr>
<td>Tense</td>
<td>p’</td>
</tr>
<tr>
<td>Aspirated</td>
<td>p’h</td>
</tr>
<tr>
<td>Fricatives</td>
<td></td>
</tr>
<tr>
<td>Plain</td>
<td>s</td>
</tr>
<tr>
<td>Tense</td>
<td>s’</td>
</tr>
<tr>
<td>Nasal</td>
<td>m</td>
</tr>
<tr>
<td>Liquid</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Adapted from “Speech perception of English consonant clusters by Korean University students learning English” by Lee, Y., 2010, p. 6.
Kabak and Idsardi (2007) demonstrate some examples of Korean phonological processes derived from Korean consonant restrictions. In other words, the illicit codas and consonantal contacts within a word in Korean are repaired by various phonological rules. First, strident consonant in Korean such as [c], [cʰ], and [s] are neutralized in the coda position to the unreleased stop [t]. (According to the commonly used Korean linguistics literature, the phonetic symbol [c] stands for voiceless alveo-palatal affricate.) For example, morphophonemic forms such as /nac/ ‘daytime’, /nacʰ/ ‘face’ and /nas/ ‘sickle’ become homophonous when they are pronounced in isolation (i.e., [nat]). Second, Korean has a nasalization rule that turns stops into nasals before nasal segments (e.g., /k.m/→[ŋ.m]; /hak+mun/→[haŋmun] ‘learning’; /p.m/→[m.m]; /cip+mun/→[cim.mun] ‘house gate’). Third, a process of lateralization occurs when nasal sounds follow other lateral sounds (/l.n/→[l.l]: /tal+nara/→[tal.la.ra] ‘moon country.’

**Error Analysis of Korean EFL Learners’ CCs Pronunciation**

As we have seen the different syllable structures of English and Korean and the different restrictions on heterosyllabic consonantal contacts of the two languages, it is plausible to conclude that Korean EFL learners have substantial difficulties in pronunciation of English consonant clusters, and accordingly they make various kinds of errors when they pronounce English CCs (Lee et al., 2002). A lot of researchers analyzed the error types that Korean EFL learners make when pronouncing English CCs (Cho & Park, 2006; Lee, Joh, & Cho, 2002). Especially Lee et al. (2002) investigated the production of English CCs by Korean EFL learners and concluded that overall Korean EFL learners have difficulty with clusters, since the overall accuracy rate of clusters amounted to only 67.6%. They also concluded that the learners had more difficulty with word-final clusters than with word-initial ones.
Lee et al.’s (2002) experiment revealed that Korean EFL learners made five types of errors on average: deletion, insertion, replacement, metathesis, and combinatory forms of error types. Lee et al. (2002) explains that deletion and insertion fall into syllable related error types and replacement falls into segmental related error types. In specific, the replacement error was the most predominant, taking up 11.2%. The next predominant error type was insertion, which amounted to 9.4%. The error rate of deletion was also high, taking up 8.2%. The combinatory error type and metathesis took up 2.9% and 0.7%, respectively. For example, the error rates of the word *bulk* according to the error type were as follows; replacement 20% (e.g. [bark]), insertion 13.3% ([balki]), deletion 10% ([buk], combination 10% ([burki]). According to the commonly used Korean linguistics literature, the phonetic symbol [ɨ] represents the high back unrounded vowel.

Lee et al. (2002) provided detailed examples of each error type. As mentioned previously, Korean syllable structure does not allow CCs in the onset or the coda position. Consequently, Korean EFL learners may choose a deletion strategy to simplify English clusters in either position. The consistent pattern of deletion was that the second sonorant consonant was deleted in a sequence of obstruent plus sonorant. For instance, the word *slave* tended to pronounced as [sɛrv] without the sonorant. Likewise, in the sequence of obstruent plus obstruent, overall the second obstruent, which was /l/ in most cases, was deleted. As to the initial three CCs, it was the third consonant that was deleted in most cases (e.g. *scrub* [scʌb]). In final two CCs, the second element was deleted more often than the first one in the sequences of both obstruent plus obstruent and sonorant plus obstruent (e.g. *adopt* [ədʌp]). However, when the first consonant was deleted in the sequence of sonorant plus obstruent, it was /t/ in most cases (e.g. *clerk* [klə:k]). Concerning three CCs, if the second consonant was either /p/ or /k/, it was the most...
frequently deleted (e.g. glimpse [glɪms]).

While vowel epenthesis to break CCs is a widely observed phenomenon in second language acquisition, Lee et al. (2002) showed that it is the second most frequent error type of Korean EFL learners. In initial two or three consonant cluster sequences, Korean EFL learners inserted a vowel either/both after the first consonant or after the second consonant (e.g. slave [sɪlɛr], scrub [skræb], [skɪræb] or [sɪkɪræb]), resulting in the more typical Korean syllable form CVCV(CV). In final two cluster sequences, vowel insertion occurred more frequently after the second consonant than the first consonant (e.g. lift [lɪfti], art [aːrti]). Two vowel insertions producing CVCV forms were rare compared to one vowel insertion. In final three consonant clusters, a vowel was inserted after the third consonant in most cases attaching an extra syllable at the end (e.g. next [neksti]). The inserted vowels were mostly [i], which is the high back unrounded vowel, but [i] after the alveopalatal affricate or fricative (e.g. [lʌntʃɪ] for lunch).

Lee et al. (2002) provide the examples of replacement errors. In word-initial, two consonant clusters replacement errors occurred saliently when a target cluster contained either /f/ or /ɵ/ (e.g. [spɪŋks] for sphinx, [s'ri] for three). Other replacement types were also observed. For instance, the alveopalatal fricative /ʃ/ was produced as the alveolar fricative [s] or [s’] (e.g. [s'rɪmp] for shrimp) and the targets /l/ and /r/ were replaced as [r] and [l], respectively (e.g. [kræs] for class, [ʃlɪmp] for shrimp). The same pattern as found with the word-initial two clusters holds true for the word-final two clusters. Thus, the substitution of /ɵ/ and /f/ with [s] and [p], respectively, was the most dominant, but the former was observed more frequently than the latter (e.g. [məns] for month, [skarp] for scarf). In word-initial and word-final three clusters, no noticeable replacement patterns emerged except the substitution of /ŋ/ with /n/ in the word-final three consonant clusters ([lɪnt] for linked).
Lee et al. (2002) found that insertion, replacement, and deletion error types occurred in combination. The most common combinatory types were composed of insertion plus replacement and deletion plus replacement (e.g. [sipiŋks] or [piŋks] for sphinx, [nɔ:s′i] for north).

Finally, Lee et al. (2002) provided examples of metathesis error types, which were relatively rare. Metathesis predominantly occurred in word final obstruent only sequences. For example, when the target cluster consists of /s/ plus /p/ and /p/ plus /s/, they were produced as [sp] and [ps], respectively (e.g. [kələsp] for collapse, [græps] for grasp).

**Teaching Consonant Clusters to Korean EFL learners**

Pronunciation teachers do not typically find themselves in a classroom populated with students who share a common native language. This is often a source of great despair. Teachers feel that the pronunciation problems of two or more given language groups are so different that working on the difficulties of one group leads to the exclusion of the others. Considering that Korean EFL learners share a common native language, which is Korean, it might be easier to teach them English pronunciation than teaching English learners whose native languages are not the same. However, teaching common pronunciation problems first will benefit Korean EFL learners because as Avery and Ehrlich (1992) point out, many problems of a more general nature can be found across English learners of different native languages.

Avery and Ehrlich (1992) introduced some common pronunciation problems that English learners encounter and provided tips on correcting each problem. Here I focus on the tips on the correction of consonant clusters pronunciation problems. Avery and Ehrlich (1992) first provided tips on some of the initial CCs, especially “when stops, /p/, /t/, /k/, /b/, /d/, and /g/ are followed by /l/ or /r/, as in words such as ‘brew’, ‘blue’, ‘dew’, and ‘glue’(p. 103).” The first tip was to have the learners insert a short schwa-like vowel between the consonants, and then pronounce
the word repeatedly, increasing their speed, until the inserted vowel disappears.

\[ \text{bəlue } \rightarrow \text{bəlue } \rightarrow \text{bəlue } \rightarrow \text{blue} \quad \text{(Avery and Ehrlich, 1992, p. 103)} \]

The second tip was to have the learners practice the same sequence in separate words. For example, the learners who cannot pronounce the /dr/ sequence, they can practice pronouncing the same sequence in the phrase ‘bad rift’ first.

\[ \text{bad rift } \rightarrow \text{ad rift } \rightarrow \text{d rift } \rightarrow \text{drift} \quad \text{(Avery and Ehrlich, 1992, p. 103)} \]

The third tip was to have the learners increase the complexity of the initial consonant clusters.

\[ \text{pit } \rightarrow \text{spit } \rightarrow \text{split} \]
\[ \text{top } \rightarrow \text{stop } \rightarrow \text{strap} \quad \text{(Avery and Ehrlich, 1992, p. 103)} \]

Avery and Ehrlich (1992) provided tips on the final CCs with grammatical endings such as /t/ and /d/ as in words such as ‘worked’, ‘filed’, ‘washed’, and ‘judged’ (p. 104). Two tips they provided were the same as they provided for the initial CCs, which was to have the learners practice using two words (e.g. feel down → feel dow → feel d → field) and to have the learners produce syllables with final CCs of increasing complexity (e.g. bread → brand → brands). The third tip provided by Avery and Ehrlich (1992) was to have the learners practice CCs created through the addition of grammatical endings. This tip was emphasized by Celce-Murcia et al. (2010, p. 107) as well because the learners need to understand the importance of such clusters in conveying meanings.

\[ \text{I watch a lot of TV. vs. I watched a lot of TV.} \quad \text{(Avery and Ehrlich, 1992, p. 104)} \]

The fourth tip provided by both Avery and Ehrlich (1992) and Celce-Murcia et al. (2010) was to teach the learners the way native speakers simplify final clusters in connected speech. For example, native speakers often do not pronounce the final consonant, when the final clusters /st/ and /nd/ are followed by a word beginning with a consonant.
Hand me the book. → Han me the book.

Post the letter. → Pos the letter. (Avery and Ehrlich, 1992, p. 104)

In addition to the tips on correction of common pronunciation problems, specific tips focused on Korean EFL learners’ pronunciation error types will benefit to them as well, because, as mentioned previously, Korean EFL learners share a native language, which is Korean and accordingly, also share many common pronunciation errors unique to them. Lee et al. (2002) provided some pedagogical implications for teaching pronunciation in the Korean EFL classroom based on the findings of their error types study. Here is the summary of the tips on pronunciation teaching for Korean EFL learners that Lee et al. (2002) provided:

The overall accuracy rate of clusters amounted to only 67.6%, which seems to show that clusters are far from easy for Korean EFL learners to acquire. Also, the subjects overall produced double CCs a little bit better than triple ones (68.4% vs. 63.3%). This result seems to indicate that in Korean EFL classrooms, learners should be presented with singletons before clusters, on the one hand, and two CCs before three consonant ones.

Overall Korean EFL learners had more difficulties in the production of final clusters (correct production rate: 63.0%) than that of initial clusters (correct production rate: 76.6%). Thus, more emphasis and instruction should be directed toward final clusters, as they are relatively hard to acquire, compared to initial clusters.

With respect to error types related to syllable structures, overall the predominant error type was insertion (9.4%) and the next salient error type was deletion (8.2%). EFL teachers should pay close attention to the insertion and deletion errors in the Korean EFL classroom and present materials which provide a chance to raise awareness and practice pronunciation of CCs related with these error types.
Concerning the different error types depending on position, EFL teachers should focus on the deletion errors of word-initial clusters, as English does not have an initial cluster reduction and accordingly the deletion errors of word-initial clusters can be more detrimental to pronunciation intelligibility than those of word-final clusters.

Concerning the replacement error type, the substitution of /ɵ/ and /f/ with [s] and [p], respectively, is the most dominant to Korean EFL learners. Accordingly, teachers should make great effort toward these errors. (Lee et al., 2002, pp. 464-467)
References


