Running head: EFFECT OF MARKEDNESS

The Effect of Markedness on Korean L2 Learners' Pronunciation of the English /l/ and /r/

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Abstract

The complex process of Second Language Acquisition (SLA) is a challenge for linguists to explain. One perspective, the Markedness Principle, states that certain language characteristics are not as common cross-linguistically. For example, the coda position in syllables occurs less universally in languages. Linking this with the well-known difficulty that native Korean speakers typically face with the English phonemes /l/ and /r/, the hypothesis states that pronouncing these sounds is most challenging in the coda. An experiment is designed to embed nonsense words containing /l/ and /r/ in a story, which is recorded as the subjects read aloud. The hypothesis is borne out, leading to the suggestion of helpful pedagogical strategies for those who teach English to speakers of other languages.

The Effect of Markedness on Korean L2 Learners' Pronunciation of the English /l/ and /r/

Introduction

Second Language Acquisition (SLA) is a topic of much research and debate in the field of linguistics. The process itself is complicated and varies from person to person. Factors such as age, language ability, learning style, personality, as well as the differences between the first language (L1) and the second language (L2), are among the many variables that affect each language learner. The focus of this paper will be the theories surrounding the differences between L1 and L2, with specific reference to contrastive analysis and, especially, the Markedness Principle. These concepts have been illuminated by linguists as they continue to delve into the mystery of human language.

The concept that there are dissimilarities between the L1 and L2 has been one of the central issues discussed by linguists. For years, the main theory regarding this factor in SLA has been the Contrastive Analysis Hypothesis (CAH) (Altenberg & Vago, 1983; Yavas, 2005). This theory contains the concept that, between the L1 and L2, "transfer" or "interference" occurs and is the main source of difficulties that language learners face (Altenberg & Vago, 1983, p. 428; Yavas, 2005). The most familiar occurrence of transfer in everyday life is the existence of foreign accents. In general, it is noticeable when someone speaks one language in a way that has echoes of another language intermingled in their speech. For example, the Spanish accent in English is sometimes heard in the exclusive use of the pure vowels (/a/, /i/, /o/, /e/, /u/[1]), instead of also incorporating other vowels in English's more complicated phonology (/æ/, /□/, /□/, and /ə/, among others).

[1] All symbols come from the International Phonetic Alphabet (IPA, 2005).

Here, the native Spanish speaker is transferring the phonological restrictions of Spanish onto English, which creates the accent. Contrastive analysis seeks to compare the differences between L1 and L2 in order to understand the process of SLA.

The CAH is has been the main theory about the differences between L1 and L2 but further studies reveal its limitations. Although contrastive analysis has provided helpful insights in the role that transfer plays in SLA, it cannot answer all questions (Yavas, 2005). Some questions that it cannot answer involve the deeper issues surrounding transfer. For instance, what factors, including age, gender, length of time studying the L2, or literacy in L1 affect the transfer process? Also, which parts of the L1 are the most likely to transfer into the L2? Furthermore, is there an order that dictates which structures or rules of the first language will be more likely to transfer? These and other questions are deeper issues to which the CAH cannot provide explanations on its own.

The shortcomings of the Contrastive Analysis Hypothesis drove linguists to research further and conceptualize new ideas. A linguistic theory known as the 'Markedness Principle' has developed to explain the factors involved in the process of SLA. Around the early 1940s, Nikolai Trubetskoy and Roman Jakobson developed the theory at the Prague School of Linguistics (Eckman, 2003). Fred R. Eckman (1977, 1981) further developed the theory as he investigated more examples of its occurrence cross-linguistically (Altenberg & Vago, 1983). His work allowed him to revise the CAH into the Markedness Differential Theory (MDH) (Altenberg & Vago, 1983). The area of phonology was actually the first area of linguistics in which markedness was investigated

(Cairns & Feinstein, 1982). The research into markedness thus far has revealed an insightful concept that will continue to shape linguists' future understanding of SLA.

Although there are many definitions of the idea of markedness, there is one in particular that will constitute the basis for the current study (Romaine, 2005). Eckman and his colleague Iverson (1977) state that the "[m]arkedness of a structure is derived from its common occurrence in languages" so that "a structure (constraint) A is more marked than another structure B if cross-linguistically the presence of A in a language implies the presence of B, but not vice versa" (Yavas, 2005, p. 201). This definition helps establish the idea that there are unmarked and marked parts of languages (Yavas, 2005). The unmarked concepts in a language are essentially those that are more commonly found cross-linguistically (Rice, 2007). Marked elements of a language are those that are essentially less common in the world's languages (Rice, 2007). In addition, with the idea of typological markedness, Eckman (1977) shows that the occurrence of a certain unmarked element in a language usually entails the occurrence of the marked counterpart of this element (Yavas, 2005). The concept of markedness provides the foundation for the research discussed in the current paper.

The need is clear for continuing research into how markedness affects the acquisition of a second language. A study done by White (1987) reveals a lot about how markedness affects a second language, but she still suggests a deeper look into the subject. Her specific question is to understand which marked constituents of a certain language will transfer to a second language (White, 1982). In addition, Cairns and Feinstein (1982) agree that more research needs to be done on the role of markedness in

syllable structure. Their recommendation is to discover more about "an explicit theory of syllable markedness" (Cairns & Feinstein, 1982, p. 193). Researchers in the field of linguistics continue to examine the role of markedness in SLA, especially regarding syllable structure.

The application of markedness to syllable structure presents an opportunity to research more about this linguistic theory. The syllable pattern CV (consonant followed by a vowel) is considered to be the most common in the world's languages (Burquest, 2006; Yavas, 2005). This means that adding a coda, which is one or more consonants at the end of a syllable, creates a comparatively more marked syllable type than the basic CV one that only has an onset, or initial consonant(s), in the syllable (Cairns & Feinstein, 1982). An example of a syllable type with a coda would be CVC. Yavas (2006) notes that each successive consonant is added to the syllable "adds a degree of markedness" to the syllable type (p. 203). The syllable structure CV is the unmarked variety, while other types of syllables are more marked.

A specific function of markedness in relation to syllables will be investigated in the current study. The concept will be applied to a common pronunciation difficulty that native Korean speakers have while learning English involving the phonemes, or the smallest units of meaningful sound, /l/ and /r/. In order to understand the nature of the difficulty, it will be necessary to examine the ways that Korean and English treat the sounds /l/ and /r/. To be specific, J. Kim, assistant professor in the Department of English and Modern Languages at Liberty University (personal conversation, November 5, 2009), states that Korean contains a character representing a phoneme similar to the English /l/

and /r/. However, there are several phonological constraints of this phoneme that cause it to be pronounced in a few different ways.

The Korean phoneme that resembles /l/ and /r/ in English is pronounced differently in various phonological environments. However, these variations in pronunciation do not create a change in meaning, so they are known as allophones (Yavas, 2005). In addition, while there is a change the pronunciation of this phoneme, it is an unconscious process (J. Kim, assistant professor, personal conversation, November 5, 2009). In other words, native Korean speakers are unaware of their changing this phoneme's pronunciation. Investigating the allophones found in this single Korean phoneme is essential to a deeper understanding of L1 Korean speakers' difficulties with English pronunciation.

In order to investigate the matter further, Table 1 represents some of the variations of /l/ and /r/ that are seen in English and Korean:

Table 1

Variations of /l/ and /r/ in English and Korean

Sound	**Description**	**Existence in Korean, English, or Both**	**Linguistic terms**	**Examples (English)**	**Examples (IPA)**
/l/	clear "l"	Both	alveolar lateral retroflex	lab allow gill	/læb/ /əla□/ /g□l/
/r/	"r"	English	alveolar retroflex	read assuring hare	/rid/ /ə□□riŋ/ /hær/
/□/	flap	Both	alveolar flap	matter city	/mæ□r/ /c□□i/
/□/	dark "l"	Both[2]	velarized lateral retroflex	full bottle	/f□□/ /b□□□/
/ʳ/[3]	weak /r/	English[4]	weak alveolar retroflex	car[3]	/kaʳ/[3]
/□l/	syllabic /l/	English	alveolar lateral retroflex which constitutes a syllable by itself	bottle	/b□□□l/

[2] However, this sound varies slightly between English and Korean.

[3] Superscript indicates the weakening of a consonant.

[4] This sound exists in some American English dialects, such as one in New England around Boston, Massachusetts. Although it is pronounced almost inaudibly, speakers are aware of the existence of an /r/ there.

To continue, there are several allophones of the Korean phoneme resembling /l/ and /r/ in English. First, the phoneme does not occur word initially in native Korean words, but there are English loan-words in which it is pronounced using the allophone [l] (J. Kim, assistant professor, personal conversation, November 5, 2009). To illustrate, the English word "radio" was borrowed into Korean; it is written with the present phoneme but pronounced with the allophone [l], resulting in [ladio] (J. Kim, assistant professor, personal conversation, November 5, 2009). Also, the allophone [l] can be heard when the phoneme is found word medially, as in the Korean [talliki] or 'jogging' (J. Kim, assistant professor, personal conversation, November 5, 2009). Moreover, when the phoneme is found between two vowels, the allophone [□] is heard, as in the Korean word [sa□ang] meaning 'love' (J. Kim, assistant professor, personal conversation, November 5, 2009). In addition, the phoneme is pronounced [□] when it is word final, as in the Korean word [ta□] meaning 'moon' (J. Kim, assistant professor, personal conversation, November 5, 2009). This single Korean phoneme includes a number of allophonic variations that cause a pronunciation change, but do not result in a semantic change.

The allophonic variation seen in the Korean phoneme resembling /l/ and /r/ in English has major implications in L1 Korean speakers' difficulties with English pronunciation. As previously mentioned the allophones of this Korean phoneme do not cause the meaning of a word to change; they are only pronounced differently because of the phonological rules applied to this phoneme in Korean. On the hand, the English sounds /l/ and /r/, similar to the Korean phoneme, do each create a difference in meaning. Thus, there is a mismatch between the way that Korean treats the sounds close to /l/ and

/r/ as allophones and the way English treats them as two separate phonemes. For this reason, L1 Korean speakers are prone to making errors in the English /l/ and /r/. In addition, these errors cause can uncertainty in the comprehension of these particular L2 English speakers by their audiences, such as when 'road' is pronounced like 'load' or 'deer' like 'deal.' The meaningful difference between /l/ and /r/ in English poses a pronunciation concern for many native Korean speakers.

It is the difficulty mentioned above that will be investigated with regards to syllable structure and markedness. It has been mentioned that the coda position of a syllable is more marked than the onset position, due to the unmarked status of the syllable CV. With this in mind, the consideration of the difficulty that L1 Korean speakers have with the English /l/ and /r/ can be investigated from a particular perspective in order to gain insight into the issue. It is hypothesized that /l/ and /r/ will be more difficult for L1 Korean speakers to pronounce when speaking English if these phonemes are found in the coda position.

In order to prove the above hypothesis, a short experiment is devised involving words that contain /l/ and /r/. The experiment uses nonsense words that the researcher created and tailored according to English phonotactics, or restrictions upon what sounds may be combined in syllables. The phonemes /l/ and /r/ are placed in the onset or coda of a variety of syllable types. Finally, all of the words are placed in a story, which is read aloud by the subjects, and analyzed for errors in /l/ and /r/. The most errors are expected to be found in the codas that contain either /l/ or /r/.

When the data from the experiment is ready to be analyzed, the errors are categorized according to which phoneme, /l/ or /r/, they are made in and whether they are made in the onset or coda of the syllable. This creates four categories, /l/ in the onset, /l/ in the coda, /r/ in the onset, and /r/ in the coda, which can be ordered according to amount of errors found in each category. The category with the least errors should be the one that contains the least difficult pronunciation of one of these sounds in a certain syllable location. Likewise, the category with the most errors should be the sound and syllable combination with the most difficult pronunciation.

With the four combinations of sound and syllable location analyzed for number of errors, the data can be organized into a range of pronunciation difficulty. If the categories are arranged on a continuum from least difficult to most difficult to pronounce, there is an opportunity to see the order in which it would be most productive to teach these four combinations of phonemes and syllable positions. Logically, the order would start from the least difficult combination of sound and syllable location and progress to the most difficult. In the end, the study begins to peel back the layers of the application of the Markedness Principle to syllable structure. In addition, it provides the initial underpinnings of research concerning how teachers of English to Speakers of Other Languages (ESOL) can effectively structure pronunciation lessons for L1 Korean speakers in their classes.

In order to understand the body of research from which this study is established, it is necessary to briefly investigate several topics. These include the ideas about transfer, markedness, and syllable structure in linguistics. Transfer is the notion that speakers can

carry over some of the rules that govern their L1 into their production of L2. While transfer is the product of a widely accepted hypothesis about SLA, it can only explain some of the errors made by L2 learners (Romaine, 2005). On the other hand, there is a newer model called the Markedness Principle, which will be discussed further in the next section. This will then be applied to syllable structure in order to provide the background for the experiment conducted in this study.

Literature Review

Transfer. The study of second language acquisition has been dominated for years by one certain theory. In order to understand what is going on when a speaker of one language learns another language, as well as foretell errors likely to occur, linguists have pointed to the Contrastive Analysis Hypothesis (CAH) (Romaine, 2005). Contrastive analysis involves the idea of "transfer" or "interference" between the speaker's native language and the target language (TL) (Altenberg & Vago, 1983, p. 428; Yavas, 2005, p. 177). For example, foreign accents come from transfer in phonology (Altenberg & Vago, 1983; Yavas, 2005). The identifiable differences between an English speaker with a Spanish accent or one with a French accent shows how transfer affects the target language differently depending on the native language of the speaker (Altenberg & Vago, 1983). Transfer is a widely noticed phenomenon in language acquisition.

Negative transfer is one type of transfer that causes the speaker to mispronounce words or have an accent. One of the reasons for negative transfer is that the native language may not contain a certain sound that the target language does contain (Yavas, 2005). Another reason may be that the native language does not distinguish between two

sounds that way the TL does (Yavas, 2005). For instance, Korean does not contain the phonemes /f, v, θ, ð, d□/ (Yavas, 2005). These sounds are frequent in English words, and Korean speakers often pronounce them as [p, b, t, d, t □] accordingly (Yavas, 2005). Negative transfer can be seen when speakers transfer phonological rules from the native language that do not apply to the target language.

Another example of transfer in English pronunciation by native Korean speakers has been previously discussed. As mentioned, there is one Korean phoneme that resembles both the English /l/ and /r/ sounds and it is pronounced differently in different phonetic contexts (J. Kim, assistant professor, personal conversation, November 5, 2009). While this phoneme is pronounced as several different allophones, this only reflects a phonological change rather than an alteration in meaning (J. Kim, assistant professor, personal conversation, November 5, 2009). On the contrary, the English sounds /l/ and /r/ are entirely separate phonemes. Therefore, the meaning of words depends on which sound is pronounced, as can be seen in the words ‘long’ and ‘wrong’ (Yavas, 2005). When L1 Korean speakers encounter these English phonemes, their tendency can be to transfer Korean phonology into their English pronunciation. In particular, the closest Korean phoneme to these English sounds is pronounced using allophones, so their tendency is to pronounce the English /l/ and /r/ in a similar fashion. The result is that /l/ and /r/ are often interchanged (such as when a speaker means to say ‘mere’ but it sounds more like ‘meal’) or substituted for other allophones of the Korean phoneme. Negative transfer in this case causes difficulty for native Korean speakers in the accurate pronunciation of the English /l/ and /r/.

Clearly, there are many examples of transfer in SLA, and linguists have heavily relied upon this and other concepts within contrastive analysis to explain L2 learner errors. However, the recent work of linguists is challenging its ability to explain all areas of difficulty. While transfer plays a role in second language acquisition, it is not the only factor involved. Altenberg and Vago (1983) admit that "it is not necessarily true that all aspects of native language phonology transfer to the target language" (p. 428). Romaine (2005) seconds this notion by saying, "On closer examination, however, variability clearly has sources and causes other than cross-linguistic influence" (p. 1). She goes on to say that both transfer and a more recent theory known as markedness play roles in second language acquisition (Romaine, 2005). Although the CAH is a helpful model, it is an incomplete explanation for the sources of errors in SLA. Another concept, known as markedness, helps linguists a more complete picture of the second language acquisition process.

Markedness. The explanatory limits of contrastive analysis have led to the conceptualization of the Markedness Principle. This idea can be explained from many perspectives, because there is "no single definition of markedness" (Romaine, 2005, p. 9). According to Eckman (2003), there are various versions of markedness. Along with his colleague Iverson, Eckman sums up the theory by saying that the "[m]arkedness of a structure is derived from its common occurrence in languages" so that "a structure (constraint) A is more marked than another structure B if cross-linguistically the presence of A in a language implies the presence of B, but not vice versa" (this is known as typological markedness) (Yavas, 2005). Another way to describe the idea is that the

marked structure is found to have a more narrow frequency in languages across the world, while the unmarked structure is what Eckman calls "privileged" with "a wider distribution" (Eckman, 2003). Markedness offers another explanation to the process of SLA.

The Markedness Principle can be further described with other terms. According to Cairns & Feinstein (1982), it is a compilation of statements that describe what the general behavior of languages has been found to be. There are certain parts of a language that follow "strong universal tendencies," which are characteristics of languages across the world (Cairns & Feinstein, 1982, p. 194). The characteristics of a language, whether it is phonetics, semantics, morphemes, or any other category that follow the universally observed propensities of many languages would be labeled "unmarked" (Rice, 2007, p. 80). Unmarked parts of a language are more frequent in the world's languages, more innate to most languages, and appear to be fundamental to human languages on the whole (Rice, 2007; Altenberg & Vago, 1983). In addition, unmarked forms in a language are more resistant to linguistic change and tend to be easier to actually pronounce (Rice, 2007). The contrast of the idea of an unmarked structure in a language is that of a "marked" structure.

Marked forms in a language are on the other end of the spectrum from unmarked forms. They do not follow the "universal tendencies" of most languages in the world (Cairns & Feinstein, 1982, p. 194). They are not found as frequently in a survey of world languages and they seem unusual to human language (Rice, 2007). Sometimes marked forms are "more complex," "unexpected," or "harder to articulate" (Rice, 2007, p. 80).

When languages change, marked forms are more likely to be dropped (Rice, 2007). In addition, these more uncommon linguistic aspects occur in all languages (Cairns & Feinstein, 1982). According to Cairns and Feinstein (1982), a language or group of languages without some marked forms would be too basic and unvaried to be a realistic human form of communication. The marked forms of a language do not follow the more general patterns found cross-linguistically.

The Markedness Principle brings new light to the study of SLA, allowing linguists to explore the idea that some aspects of languages are distinct from the usual characteristics. While the CAH compares two languages and sees the differences between them as sources of errors made by L2 learners, there is another hypothesis that goes beyond this. Using the Markedness Principle, Eckman (1977, 1981) developed the Markedness Differential Hypothesis (MDH) as a revision of the earlier CAH (as cited in Altenberg & Vago, 1983). Essentially, the MDH states that, if there are areas in L2 that are different from L1 and more marked as well, then these are the areas that will be especially difficult for the language learner (Altenberg & Vago, 1983). The Markedness Principle reveals a new dimension to SLA that could not be seen in the previous Contrastive Analysis Hypothesis (CAH).

Syllable structure. Given this background of the Markedness Principle, it is now crucial to survey the concept of syllable structure in order to uncover the relation between the two concepts. To begin, the syllable is a basic phonological segment of a word that is comprised of phonemes. The components of the syllable are the onset and rhyme, consisting of the nucleus and the coda (Cairns & Feinstein, 1982, p. 197). In all

languages, a rhyme is required to form a syllable and it is usually a vowel (Cairns & Feinstein, 1982). The onset and the coda are both optional in the formation of a syllable, but the onset occurs more frequently than the coda in most languages (Cairns & Feinstein, 1982). Linguists represent the basic syllable today with a diagram that looks like this:

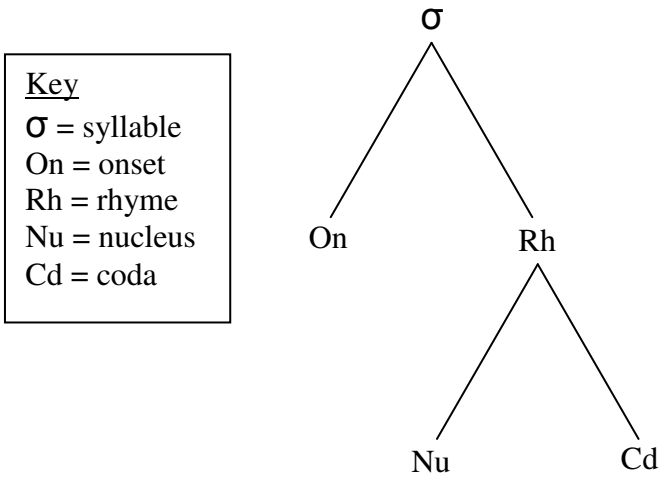

Figure 1. Basic syllable structure (adapted from Cairns & Feinstein, 1982, p. 196).

One of the governing principles of syllable structure is sonority. The principle involves a sound and "the degree of opening of the vocal tract during its articulation" (Yavas, 2005). To be specific, "the more open the vocal tract is for a sound, the higher its sonority will be" (Yavas, 2005, p. 131). This means that vowels are the most sonorous sounds and stops are some of the least sonorous (Yavas, 2005). In fact, there is a scale of sonority on which sounds are placed by value from one (least sonorous) to ten (most sonorous) (Yavas, 2005). Flaps and nasals are in the middle, while fricatives are in the lower end of the scale (Yavas, 2005). Sonority is vital to the structure of a syllable because the rhyme is always the most sonorous part of the structure, meaning that it is

usually a vowel (Yavas, 2005). This is known as the "peak of sonority" (Yavas, 2005, p. 132). Less sonorous sounds are on either side of the peak (Yavas, 2005). The influence of sonority creates a general pattern found in syllables.

It has been seen that sonority governs the additional sounds that can be added to syllables. In addition, it should be noted that, due to the optional components of a syllable that can be added to the rhyme, there are several versions of the syllable that occur in the world's languages. The simplest syllable, comprised of one vowel (V), becomes increasingly complex as consonants (C) are added to the onset, coda, or both (Yavas, 2005). In English, for example, there are the following types of syllables[5] among others: V, VC, CV, CVC, CCVC, CVCC, CCCVCC. A syllable with an onset but no coda is labeled "open," while a syllable with both an onset and a coda is labeled "closed" (Cairns & Feinstein, 1982, p. 196). Examples of open syllables in English include CV and CCV syllables, while examples of closed syllables include CVC and CCVC syllables.

This background of the patterns of syllable structure in the world's languages provides an important context for this paper. It is noted that the syllable type CV is found in all known languages (Burquest, 2006; Yavas, 2005). Some languages do not include any other type of syllable (Burquest, 2006). One example of this is the Hawaiian language (Rice, 2007). Another proof of the unmarked quality of the CV syllable type is that cross-linguistically, a large number of languages only allow simple onsets (no more than C in the onset) and do not allow codas (Rice, 2007). The CV syllable structure is an important basic component of most languages.

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[5] See Appendix 1 for examples of English words of various syllable types.

The idea that the CV syllable type is basic to many languages coincides with the concept of markedness. For example, languages with more marked forms of syllables always contain the simple type CV (Rice, 2007). The implicational aspect of markedness that is noted in the previous examples from the section about markedness would allow these researchers to note that when a language contains any other syllable types other than CV, it will also include the CV type (Rice, 2007). Thus, having additional, more marked types of syllables in a language means that the unmarked CV syllable will more than likely occur in the language (however, this idea does not apply in the reverse) (Rice, 2007). This basic syllable structure can be considered unmarked because of its presence in languages with more complex syllable types.

In addition, there are other reasons why CV is considered the unmarked syllable type cross-linguistically. Another proof of the unmarked status of CV in the world's languages is found in the study of first language acquisition. Children who are native speakers of languages across the world tend to acquire this syllable before they acquire other syllable types (Lleó, Kuchenbrandt, Kehoe, & Trujillo, 2003). In addition, the markedness theory proposed by Chomsky (1981) states, "In the absence of evidence to the contrary, the child will select the unmarked options" (p. 11, 2005). The language tendencies of children reveal that CV can be considered an unmarked structure.

Another feature of the syllable pattern CV that relates to its unmarked status is seen in the syllabification tendencies of languages. For instance, when there is a sequence of phonemes such as VCV, languages tend to syllabify into two syllables, usually as V-CV (Cairns & Feinstein, 1982). In this syllabification, the consonant in the sequence

generally becomes part of the second syllable's onset (Cairns & Feinstein, 1982). Among other proofs, linguists use examples from first language acquisition and syllabification propensities across languages to show that CV is the most common type of syllable.

Along with the idea that CV is the most common and most unmarked syllable structure, there are other considerations to ponder. Not only does this syllable form contain a simple onset, but it is also an open syllable. The syllable is devoid of a coda. It can be inferred from the unmarked status of the CV syllable that the existence of the coda in syllable types has a more marked status (Cairns & Feinstein, 1982). It has been noted that a continuum of markedness exists, with CV syllables located more toward the unmarked end and CVC syllables moving toward the marked end (Gass & Selinker, 2001, p. 163). Each consecutive consonant that is added to the syllable "adds a degree of markedness" (Yavas, 2005, p. 203). As a result, native speakers of a language with only the less marked form of CV are more likely to reproduce a CV form when confronted with a more marked form, such as CVC, in the language they are learning (Gass & Selinker, 2001). The unmarked CV syllable can become the default syllable that speakers of one language end up recreating in a target language with more marked forms of the syllable.

Not only is the syllable with a coda marked, but also what goes into the coda is highly restricted (Cairns & Feinstein, 1982). Researchers note that cross-linguistically the phonemes allowed in the coda are significantly more limited than those permitted in the onset of syllables, especially in complex codas (those containing more than one consonant) (Burquest, 2006). In English for example, the word "bird" has a complex coda

containing /r/ and /d/ in a consonant cluster. However, a combination such as /l/ and /g/ is not allowed, so the word "nilg*" could not occur (Yavas, 2005, p. 140). From looking at these two English phonemes, it can be seen that the restrictions[6] on the coda outnumber those on the onset (Yavas, 2005). The coda is known to be a more restricted environment for sounds than the onset, and this was taken into account when designing the experiment for the current study.

Another important consideration in this paper is the syllable structure of Korean. This language has fewer types of syllables than English. Korean includes the syllables V, CV, VC, and CVC (Lee, 1994). The onset, although not required, allows up to one consonant and the coda follows the same pattern (Lee, 1994). English, however, allows up to three consonants in the onset and up to four in the coda (Yavas, 2005). Therefore, "onset and coda clusters" are "major trouble spots" for Korean speakers learning English as a target language (Yavas, 2005, p. 195). The more complex nature of English syllables poses pronunciation difficulties for native Korean speakers learning the language.

Method

It has been noted that the Markedness Principle plays a vital role in the difficulties that L2 English speakers encounter in pronunciation. However, this area of linguistics requires more research in order to be more fully understood (Cairns & Feinstein, 1982). Intending to provide some research about the interaction of markedness and syllable

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[6] The combinations allowed in the onset and the coda in English involving the phonemes being considered in this study, /l/ and /r/ are summarized in Appendix 2. These constraints were used to create English-like words for the experiment discussed later on.

structure, a hypothesis was proposed, that /l/ and /r/ would be more difficult to pronounce in the coda rather than in the onset of syllables. Then, it was necessary to conduct a simple experiment. First, nonsense words that conformed to English phonotactics[7] were created to include /l/ and /r/ in the onset or coda of various syllable types. These fifty-eight monosyllabic words look and sound like English, but do not actually have meaning in the English language. This was done so that the subjects would have to make an educated guess at how to pronounce the word correctly, instead of having already heard the words in real life. The list is as follows (with the expected pronunciation in IPA next to each word):

[7] Also see Appendix 3.

Table 2

Nonsense Words Created for the Experiment

/l/, onset		**/l/, coda**		**/r/, onset**		**/r/, coda**	
blem	/bl□m/	*folge*	/fold□/	*rems*	/r□mz/	*tweer*	/twir/
glip	/gl□p/	*skall*	/skal/	*dree*	/d□ri/	*skork*	/skork/
sloo	/slu/	*voll*	/vol/	*rop*	/r□p/	*morb*	/morb/
plunds	/pl□ndz/	*squilled*	/skw□ld/	*scrooned*	/skrund/	*twerve*	/tw□rv/
plosk	/pl□sk/	*zulled*	/z□ld/	*ront*	/r□nt/	*nerth*	/n□rθ/
le	/l□/	*stelp*	/st□lp/	*frup*	/fr□p/	*snarked*	/snarkt/
flant	/flænt/	*bilb*	/b□lb/	*granch*	/grænt□/	*smersk*	/sm□rsk/
lom	/l□m/	*spolts*	/spolts/	*brunks*	/br□nks/	*squarth*	/skwarθ/
la	/la/	*quoll*	/kw□l/	*ra*	/ra/	*gare*	/gær/
splench	/spl□nt□/	*twelps*	/tw□lps/	*froo*	/fru/	*snarr*	/snar/
slee	/sli/	*squailled*	/skwe□ld/	*drents*	/d□r□nts/	*squirk*	/skw□rk/
flisked	/fl□skt/	*milth*	/m□lθ/	*rizz*	/r□z/	*jore*	/d□or/
len	/l□n/	*strills*	/str□lz/	*roft*	/r□ft/		
splogs	/spl□gz/	*thell*	/θ□l/	*trop*	/tr□p/		
		thwald	/θwald/	*ree*	/ri/		
				frep	/fr□p/		
				strills	/str□lz/		

Secondly, the words were placed in a story[8] that was comprised entirely of Standard English, with the exception of the words above. The point of the story was to take the focus off of the research and create a more natural environment for the pronunciation of the nonsense words.

Third, Korean students from Liberty University and the English Language Institute were asked to participate in the research. The demographic[9] can be summarized as follows: 19 native Korean speakers currently involved in learning English, one from the advanced level of English proficiency, nine from the intermediate level, and nine from the beginning level. Ten of the students were enrolled at the English Language Institute (ELI) at Liberty University and nine were undergraduate students at Liberty University.

Prior to conducting the experiment, the subjects were told only as little information about the project as possible. For example, they were told that the researcher was studying how to teach English to speakers of other languages. However, they were not told exactly what the project was about or that there were non-English words in the story they were about to read. The subjects could not be informed about these details because they would focus on the words too much and their readings of the story would be unnatural. Also, in order to further distract the reader's attention from the purpose of the research, three basic comprehension questions were asked at the end of the reading. First,

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[8] The text of the story can be found in Appendix 4.

[9] See Appendix 5 for the full demographic.

the researcher and subjects met in the language lab at Liberty University. Each subject was handed a copy of the story and the following questionnaire face down on the table:

Questions:

1. What was the name of the boat?
2. Did the storm sink the ship?
3. Did the sailors arrive at their destination?

When the researcher was ready to record, the subject was asked to put on the headphones and microphone used in conjunction with the recording software. Then the researcher started to record and a few seconds later asked the subject to begin reading out loud into the microphone. The exercise was not timed; each subject was given adequate time in order to complete the reading. Afterwards, the subjects were asked to fill out the questionnaire of comprehension questions to the best of their ability. The completed questionnaires were collected and filed by the researcher, while the recordings were saved to a flash drive.

After the recordings were complete, the next part of the research involved data analysis. In order to do this, a computerized chart of each experimental nonsense word in the story was typed in the International Phonetic Alphabet (IPA). Then, the successive columns on the chart were dedicated to each speaker's pronunciation of each nonsense word from the story. While filling in the chart, the speaker's pronunciation was written down in IPA, according to what the researcher heard on the recordings, and later color-coded for either its accuracy or the existence of errors. Later, the data was analyzed according to type of errors by phoneme and syllable position, as well as the number of

errors per syllable type. The results from the study will be discussed in detail for part of the remainder of this paper.

Results

Once the data from the experiment was analyzed, it was possible to categorize the errors in different ways, starting with types of errors made. For instance, the types of errors found in the nonsense words included consonant deletion, metathesis, consonant weakening, substitution, vowel insertion that produces a syllable structure like that of the native language, and a category for other strategies[10]. To explain, consonant deletion involves the omission of /l/ or /r/ from the expected pronunciation. Furthermore, metathesis is when the order of two sounds is switched. Also, consonant weakening happened when the /l/ or /r/ was not produced with the full strength that it usually is in English. In addition, substitution is when another consonant sound is substituted for /l/ or /r/. Finally, vowel insertion sometimes happens when an epenthetic vowel, usually /ə/, is inserted in the syllable. This occurs because the speaker is making a more complicated syllable simpler, usually creating the default CV syllable. Examples of these strategies in use will be discussed later in the paper.

All known errors were categorized according to these categories, with the additional category of "other" for miscellaneous errors unclassifiable using the main categories. In addition, the errors were indexed according to the phoneme mispronounced and its position in the syllable. The combinations of phoneme and syllable position

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[10] The category "Other" seen on the upcoming charts includes miscellaneous strategies that do not fall under categories that are beyond the scope of this paper.

became four categories: /l/ in the onset, /l/ in the coda, /r/ in the onset, or /r/ in the coda. Then, the errors found in the nonsense words were placed in these categories in tally form. Finally, patterns of errors emerged from the data, which will be illuminated in the next section.

Discussion

As mentioned, the results of the compilation of the data reveal patterns in the errors. As noted by Yavas (2006) adding another consonant to the unmarked syllable structure CV "adds a degree of markedness" to the syllable type (p. 203). This can be seen clearly in the overall trend of the data. Figure 2 shows a positive correlation between the syllable type and the average errors per word:

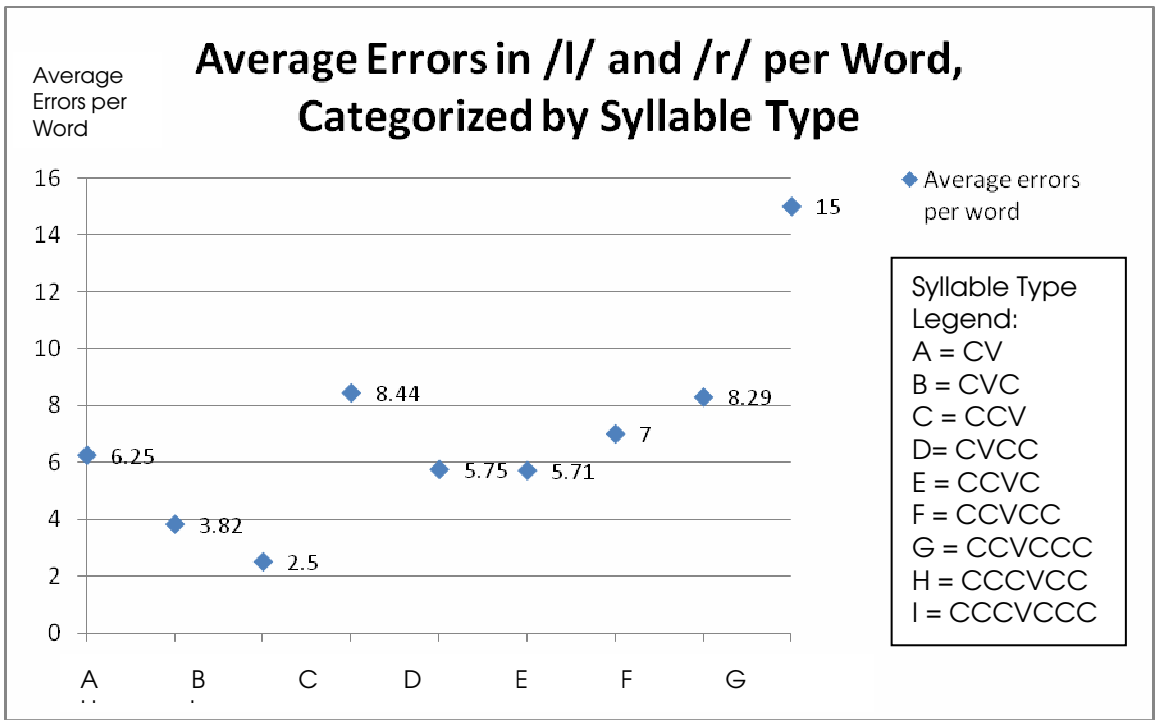

Figure 2. Average Errors in /l/ and /r/ per Word, Categorized by Syllable Type[11].

[11] For additional charts, see Appendix 6

According to this scatter plot, the data reveals a trend that confirms the proposal given by Yavas (2006). Comparatively less errors were made in the simple CV syllables than in the more complex CCCVCCC syllables. In between, the trend is a positive correlation between increasing complexity of syllable type and increasing average number of errors per word. This view of the data confirms the working of the Markedness Principle with regards to syllable type.

In addition, another view of the data revealed the number of errors by syllable position. Overall, the most errors are found in the coda of the syllables, as opposed to the onset. Figure 2 shows that the percentage of errors in the coda is 58% and the percentage of errors in the onset is 42%. The difference between the percentage of errors in the two positions is noteworthy, as seen in Figure 3:

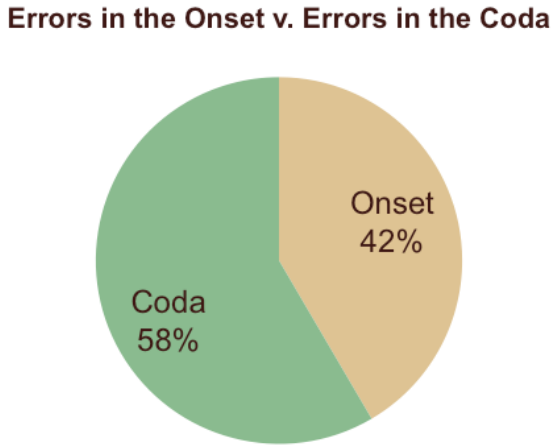

Figure 3. Errors in the Onset v. Errors in the Coda.

Due to this analysis, it is seen that the hypothesis formulated for this experiment was borne out. In accordance with the fact that linguists consider the coda a more marked structure in syllables than the onset, the results of the experiment show that a majority of

the errors in /l/ and /r/ were in the coda position. As this stands, it can be concluded from the data that the coda presents a more challenging location for the correct pronunciation of the English /l/ and /r/. However, in order to more fully understand the patterns found in the errors, additional analysis will be examined.

Further inspection of the data involved a detailed account of the total errors made in /l/ and /r/ in the onset of the monosyllabic nonsense words. Figure 3 shows the errors in the onset categorized by the phonological strategies used by the speakers[12]:

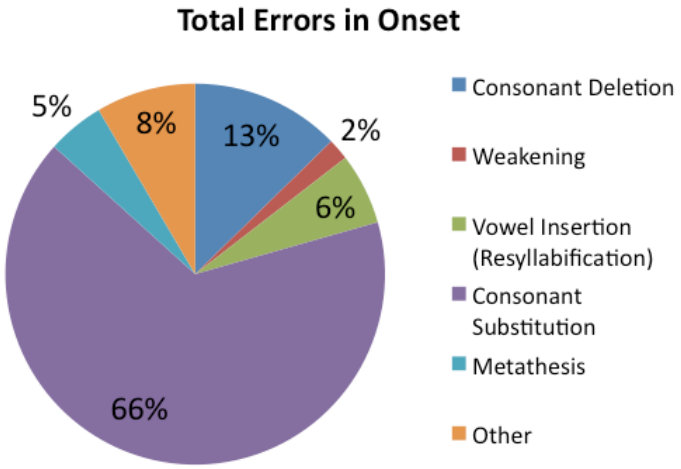

Figure 4. Total Errors in the Onset.

The most used strategy was consonant substitution, followed by consonant deletion. Consonant substitution that affects /l/ involvs the replacement of the phoneme with one of these three sounds: /r/, the sound /□/ (the one found in Korean), or the flap

[12] For a more detailed analysis of the errors in the onset categorized by phoneme, see Appendix 7.

/□/ found in Korean. If it affects /r/, then the replacement sound is either /l/ or the two Korean sounds mentioned above.

An example of the consonant substitution strategy in use with the phoneme /l/ comes from the experimental word "glip" that is supposed to be pronounced /gl□p/. For instance, one subject replaced the /l/ in the onset with the sound /r/ and the resulting word became /grip/. Another incidence of consonant substitution is when the phoneme /l/ is replaced by an alveolar flap /□/, which is one of the allophones of the Korean sound resembling the English /l/ and /r/. For example, the experimental word "rems" (correct pronunciation /r□mz/) was rendered /□□mz/ by one of the subjects. These cases of consonant substitution highlight its frequent use by the subjects while pronouncing the experimental words.

To continue, Figure 5 shows the total errors in the coda categorized by the phonological strategies used[13]. Once again, consonant substitution comprises the greatest number of errors. In this case, the second most frequently used strategy is vowel insertion (resyllabification).

[13] For a more detailed analysis of the errors in the coda categorized by phoneme, see Appendix 8.

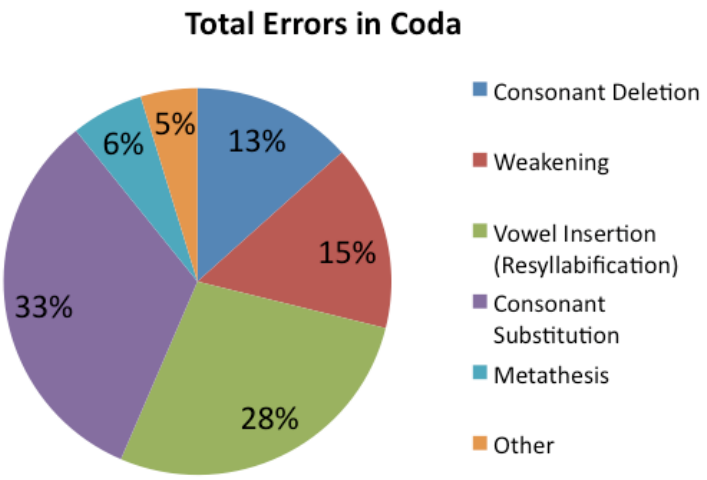

Figure 5. Total Errors in the Coda.

Errors involving consonant substituition and vowel insertion (resyllabification) are almost in equal distribution here.

Consonant substitution in the coda involves same sounds as mentioned before. For example, one subject pronounced the experimental word “quoll” (the expected pronunciation being /kw□l/) as /kw□□/ (using the Korean pronunciation of the “dark” /l/). Another subject pronounced “nerth” (expected pronunciation /n□rθ/) as /n□l•θə/. Here there is also resyllabification going on because /ə/ is inserted after the /θ/ to break up the consonant cluster in the syllable. The target word involves a CVCC syllable type, but the speaker changes into two syllables of CVC and CV. This creates a situation where the basic syllable type CV is formed to cope with a difficult syllable involving a consonant cluster. This follows the research of Cairns and Feinstein (1982) previously mentioned, which shows how languages usually syllabify a sequence like VCV into two syllables like V-CV.

From a comparison of the two charts, it can be seen that vowel insertion leading to resyllabification is used much more frequently in the coda. While this strategy is used six percent of the time for /l/ and /r/ in the onset, it is used 28% of the time in the coda. An example of a speaker using vowel insertion in the coda is in the experimental word "snarked" (expected pronunciation /snarkt/), which is pronounced /sna^{r}•kə•t□/. Here a CCVCCC syllable becomes three syllables of CCVC, CV, and CV by the addition of /ə/ and /□/ after certain consonants. The vowels that are inserted break up the consonant clusters and create the default CV syllable. The more marked syllable CCVCCC becomes a group of three less marked syllables when vowel insertion is employed.

The vowel insertion strategy is an example of the ideas previously mentioned in markedness research. Gass and Selinker (2001) note that there is a continuum of markedness: CV syllables are on the unmarked end and CVC syllables are on the marked end. Moreover, Yavas (2006) mentions that whenever a consonant is added to the syllable, this "adds a degree of markedness" (p. 203). Thus, when speakers of a first language having a higher frequency of the syllable type CV come across a more marked syllable type, such as those found in English, the speakers are likely to produce the unmarked CV form (Gass & Selinker, 2001). The results of the experiment show this concept repeatedly.

In addition, to the detailed analysis of phonological strategies, there is another vital perspective revealed by the data. Specifically, the errors are also categorized according to two criteria: the phoneme involved and whether it is found in the onset or coda. Figure 6 shows the percentages of errors in these combinations:

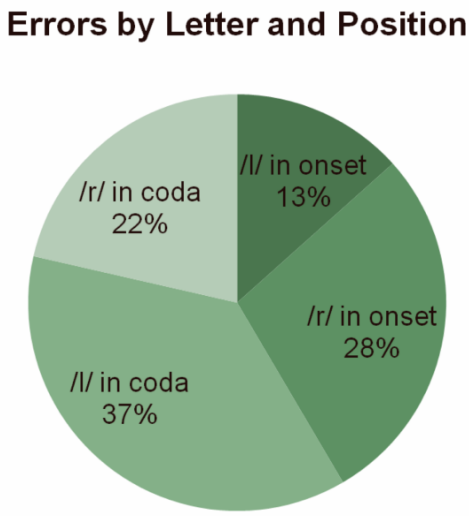

Figure 6. Errors by Letter and Position.

Using this data, a range of difficulty can be configured from the combinations with the least errors to those with the most errors. Figure 7 shows a continuum based on the percentage of errors in each section:

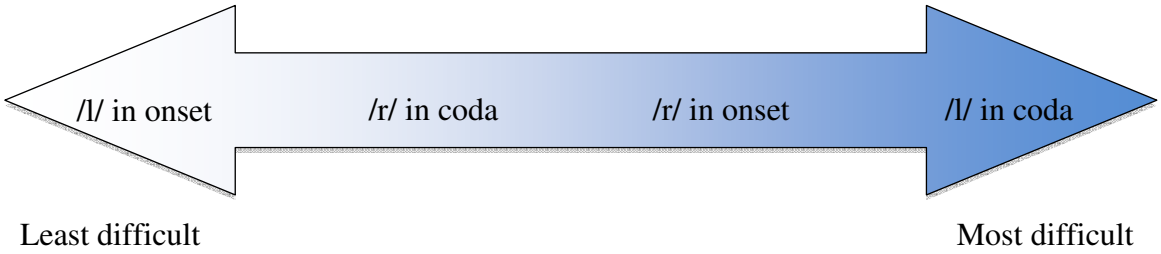

Figure 7. Range of Difficulty.

The greatest percentage of errors is found in the coda involving /l/, thus this is the most difficult application of the phoneme to pronounce correctly. On the other hand, the least percentage of errors is found in the /l/ when found in the onset; therefore this is the least difficult position of the phoneme to pronounce correctly. In between, the next greatest percentage of errors is found in the coda when involving /r/ and after that in the onset

involving /r/. Once the data is analyzed according to each combination of phoneme and syllable position, a range of difficulty becomes evident.

The specific order of the categories in the range of difficulty offers interesting feedback on the results of this experiment. The broad view shows /l/ in the onset as the least difficult and /l/ in the coda as the most difficult, which makes sense according the hypothesis of the study. The reasons are not clear why the specific phoneme /l/ is located on either end of the spectrum, while /r/ in either syllable position is found in the middle. Further experiments including more subjects could confirm the data, as well as reveal whether there are certain phonological factors playing into the matter. Also, there might be variables (such as age, gender, or English proficiency) in the experiment that, if isolated, could change the outcome of subsequent replications. Overall, there is future research to be done in this area that would shed light on the order of the difficulty found on this spectrum.

The range of difficulty revealed by the data offers implications in the field of teaching. Specifically, it is a starting point for teachers of English to speakers of other languages (ESOL) to understand more about training native Korean speakers in the pronunciation of /l/ and /r/. It is suggested that ESOL teachers practice the pronunciation of the easiest section of this continuum before moving onto the more difficult sections. For example, a list of words involving /l/ in the onset of words could be compiled and practiced thoroughly. When students are ready to work on harder levels of /l/ and /r/ pronunciation, the teacher can assess their progress and decide when to begin another segment. Then, lists of words involving /r/ in the coda could be practiced. Subsequently,

words with /r/ in the onset could be found in pronunciation exercises. Finally, the /l/ in the coda could be practiced to finish the unit. This progression would help students to follow the combinations of phoneme and position from the least difficult to the most difficult.

Conclusion

Markedness is an important theory in the field of linguistics that offers a deeper understanding of the process of SLA. Although the CAH is a useful hypothesis in this area of linguistics, it is necessary to have another perspective on the questions that it cannot answer. The idea that transfer occurs between languages is insightful, but the more profound details of this subject can be explored through markedness. While the CAH can simply state that transfer is occurring and illuminate the details of what is happening, markedness can be used to investigate why transfer occurs in specific instances. Utilizing markedness in the present study allows a better awareness of where Korean speakers learning English tend to have more trouble with /l/ and /r/.

The results of this experiment show that the challenges Korean speakers face with the English /l/ and /r/ can be categorized according the level of difficulty speakers have with the phonemes in the onset or the coda. The range of difficulty found in this study includes the idea that /l/ in the coda is the most difficult of the chosen combinations of phoneme and syllable position. The results may have been unique to this study due to the specific number of variables involved and the limitations of the number of subjects. An expansion of the current study to include more speakers could probably be expected to verify the idea that one or both of the phonemes is more difficult in the coda position.

The specific order of the four categories in the range of difficulty established in the current study from least difficult to most difficult (/l/ in the onset, /r/ in the coda, /r/ in the onset, /l/ in the coda) may end up varying in subsequent duplicate experiments.

Although the current study was conducted in a reasonably consistent manner, there are several variables likely to have affected the data. These variables (e.g. age, gender, or English proficiency) need to be isolated so that their effect on the data can be more clearly seen. It would be helpful to categorize future experiments in ways that attempt to isolate the variables involved in the study so that researchers can gain more insight into the range of difficulty Korean speakers come across with /l/ and /r/. Limitations on the pool of subjects could allow the experiment to be tailored to a particular age group, gender, or other group with certain characteristics. Each experiment would yield further information from different angles on the factors that affect the apparent markedness of the phonemes /l/ and /r/ in the coda position.

In addition to the isolation of variables, there are other considerations that might improve on this study. For example, there directions for future research that could include the expansion of the current experiment to cover more linguistic territory. The experiment could be expanded so that more speakers of various languages are included. Subsequent experiments could be grouped according to Asian languages (e.g., Chinese, Korean, Japanese), languages found in the Pacific Ocean region (e.g., Hawaiian, Tongan), and other language groups that are known to have significant dedication to the CV syllable. Would the results of this study hold true for the different groups of languages? Would the results vary according to individual languages, despite a

commonality found in all them of having a significant tendency of CV syllables? The current experiment was conducted with Korean speakers, whose language allows CVC as well as CV, but how would the results look if another experiment was done involving languages that do not allow any other syllable other than CV? It would be insightful to the study of linguistics to discover whether the results found in this study carry over to other language groups.

The importance of this research and future investigations similar to it involves both theoretical and practical implications. For example, Markedness Principle is in process and linguists are constantly searching for ways to deepen their knowledge of the concept. The idea can apply to many areas in linguistics, so it may be the beginning of a more comprehensive theory in this field. In turn, these theories can be applied to practical situations, such as teaching ESOL classes. Understanding how language learning works is fundamental to teaching a language. Without a proper orientation as to how information is best processed by the language learner, a teacher may become frustrated with ineffective methods. On the other hand, a teacher will be well-equipped if he or she has an close understanding of the reasons for particular difficulties faced by language learners face and how to overcome these difficulties. Research can lay a foundation for theories that can be applied to successful teaching.

The research found in the current study initially answers the question about whether Korean speakers encounter a more marked structure when they are learning the English /l/ and /r/ in the coda position of a syllable. There are, however, many more questions to answer about the practical applications of this research. For example, how

would the results of this study be applied in a class room to help L1 Korean speakers master these two English phonemes? It could be a matter of using minimal pairs, or pairs of words differing by one sound and having two separate meanings, that use words from each category in succession from easiest to hardest in the range of difficulty found in the present study. Also, how would age, gender, learning style, brain dominance, and other factors influence that way that ESOL teachers should teach this area of pronunciation? There are other options that should be explored in the realm of teaching strategies in order to put the results of this study into practical use in ESOL pedagogy.

The results of this study provide a preliminary framework for future research into the observation that the coda is a more marked structure cross-linguistically. It can be observed that /l/ and /r/ are found by these results to be more difficult in the coda position. Subsequent research would be expected to verify this basic idea, although the specific order of the combinations of phoneme and syllable position would probably vary within the range of difficulty if the experiment were expanded. The applications of the study allow an initial range of difficulty to be brought to the attention of those who structure ESOL lessons for native Korean speakers. It is hoped that this research will be expanded so that more attention will be given to the role that the Markedness Principle plays in syllable structure with regard to the pronunciation of difficult phonemes.

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Appendix 1: Examples of English Words of Various Syllable Types

CV	lye /la□/	rye /ra□/	lay /le□/	ray /re□/	low /lə□/	row /rə□/	raw /r□/
CCV	dry /d□ra□/	sly /sla□/	play /ple□/	slay /sle□/	cry /kra□/	clay /cle□/	tray /t□re□/
CVC	lane /le□n/	rain /re□n/	late /le□t/	rate /re□t/	lake /le□k/	rake /re□k/	mall /m□l/
CCVC	slick /sl□k/	trick /t□r□k/	slight /sla□t/	dream /drim/	troop /t□rup/	drill /dr□l/	prim /pr□m/
CVCC	land /lænd/	launch /l□nt□/	left /l□ft/	ranch /rænt□/	rift /r□ft/	rolled /r□ld/	lard /lard/
CCVCC	slates /sle□ts/	slant /slænt/	clump /cl□mp/	shrimp /□r□mp/	drink /drink/	start /start/	stilt /st□lt/
CCCVCC	strength /striŋθ/	strange /strænd□/	scrimp /scr□mp/	strict /str□kt/			
CCVCCC	slants /slænts/	slumps /sl□mps/	shrinks /□rinks/	trunks /tr□nks/	drinks /drinks/	clumps /klumps/	storks /storks/

Appendix 2: Phonotactic Restraints on Double Onsets and Double Codas in English[14]

Restraints on double onsets in English

	/l/	/r/
/p/	●	●
/b/	●	●
/t/		●
/d/		●
/k/	●	●
/g/	●	●
/f/	●	●
/v/		
/θ/		●
/s/	●	
/□/		●
/h/		
/m/		
/n/		
/l/	○	

Restraints on double codas in English

	/l/	/r/
/p/	★	★
/b/	★	★
/t/	★	★
/d/	★	★
/k/	★	★
/g/		★
/t□/	★	★
/d□/	★	★
/f/	★	★
/v/	★	★
/θ/	★	★
/s/	★	★
/z/	X	X
/□/	★	★
/m/	★	★
/n/	★	★
/l/	○	★

Key

● = Double onsets allowed

○ = Impossible combination

★ = Double codas (not including suffixes)

X = Double codas (suffixes)

[14] Adapted from Yavas (2005, p. 137, 140)

Appendix 3: Table 2

Nonsense Words Created for the Experiment

/l/, onset		**/l/, coda**		**/r/, onset**		**/r/, coda**	
blem	/bl□m/	*folge*	/fold□/	*rems*	/r□mz/	*tweer*	/twir/
glip	/gl□p/	*skall*	/skal/	*dree*	/d□ri/	*skork*	/skork/
sloo	/slu/	*voll*	/vol/	*rop*	/r□p/	*morb*	/morb/
plunds	/pl□ndz/	*squilled*	/skw□ld/	*scrooned*	/skrund/	*twerve*	/tw□rv/
plosk	/pl□sk/	*zulled*	/z□ld/	*ront*	/r□nt/	*nerth*	/n□rθ/
le	/l□/	*stelp*	/st□lp/	*frup*	/fr□p/	*snarked*	/snarkt/
flant	/flænt/	*bilb*	/b□lb/	*granch*	/grænt□/	*smersk*	/sm□rsk/
lom	/l□m/	*spolts*	/spolts/	*brunks*	/br□nks/	*squarth*	/skwarθ/
la	/la/	*quoll*	/kw□l/	*ra*	/ra/	*gare*	/gær/
splench	/spl□nt□/	*twelps*	/tw□lps/	*froo*	/fru/	*snarr*	/snar/
slee	/sli/	*squailled*	/skwe□ld/	*drents*	/d□r□nts/	*squirk*	/skw□rk/
flisked	/fl□skt/	*milth*	/m□lθ/	*rizz*	/r□z/	*jore*	/d□or/
len	/l□n/	*strills*	/str□lz/	*roft*	/r□ft/		
splogs	/spl□gz/	*thell*	/θ□l/	*trop*	/tr□p/		
		thwald	/θwald/	*ree*	/ri/		
				frep	/fr□p/		
				strills	/str□lz/		

Appendix 4: Text of the Story Created for the Experiment.

The Mysterious Island

There once was a folge island just south of the rems. Only the bravest sea captains could find this legendary place. When a dree wind blew over the skall, one daring man set out to find the island. He hired a crew of blem sailors to go with him on the tweer journey. Their ship, *The Glip Skork*, was quite rop. Once their finest voll was scrooned, they were ready to head out. The sky was clear and a good ront was in the sloo. They set sail for the rems in high spirits. Halfway there, a giant frup squilled on the horizon. The captain ordered the morb to be zulled at once. In all of the twerve, a man went overboard into the plunds. The stelp of the approaching granch was terrifying. Thinking quickly, the bilb captain tossed the man one of the spolts. Unfortunately, the plosk of the giant nerth was already quoll.

With one less sailor, the ship continued on its course away from the brunks. The le and ra of the twelps overhead was enough to frighten even the bravest sailor. The crew wondered if this journey was worth the cost. Suddenly, a flant man snarked about the purple lom in the air. The sky grew cloudy and hid the sun. Every good sailor knew that this meant a storm was in the la. With froo and smersk, they made the ship ready. They squailled the drents and tied down the sails. Then, the captain ordered everyone inside. Minutes later, the wind picked up and turned the splench into rizz. The squarth ocean became gare in the roft. The waves crashed over the ship, but the crew kept slee and trop below deck.

Finally the ree of the wind flisked until everything was frep again. In all of the milth, the sailors didn't realize that the ship had reached the strills. Eventually, the snarr opened the thell with a squirk. They had miraculously arrived at the island! The captain was the first with enough len to step foot on the splogs. Everything he saw was thwald and jore. It was the most beautiful place any of the sailors had ever seen.

Appendix 5: Demographic

Speaker	**Age**	**Native Language**	**Current schooling**	**English proficiency**	**Time learning English**	**Time in English-speaking country**
A	24	Korean	Undergraduate	Advanced	9 years	9 years
B	n/a	Korean	Undergraduate	Beginning	n/a	n/a
C	20	Korean	Undergraduate	Beginning	5 years	6 months
D	20	Korean	Undergraduate	Intermediate	4 years	2 years
E	28	Korean	Undergraduate	Intermediate	15 years	4 years
F	20	Korean	Undergraduate	Intermediate	9 years	2 years
G	n/a	Korean	Undergraduate	Intermediate	n/a	n/a
H	23	Korean	Undergraduate	Intermediate	9 years	3 years
I	n/a	Korean	ELI[15]	Intermediate	n/a	n/a
J	19	Korean	ELI	Beginning	3 years	3 months
K	n/a	Korean	ELI	Beginning	n/a	3 months
L	n/a	Korean	ELI	Beginning	n/a	3 months
M	28	Korean	ELI	Intermediate	1 year	1 year
N	n/a	Korean	ELI	Beginning	n/a	3 months
O	n/a	Korean	ELI	Beginning	n/a	3 months
P	n/a	Korean	ELI	Beginning	n/a	3 months
Q	21	Korean	ELI	Beginning	5 years	3 months
R	22	Korean	ELI	Intermediate	1 year	2 years
S	23	Korean	Undergraduate	Intermediate	9 years	3 years

[15] English Language Institute at Liberty University

Appendix 6

Syllable Type	**Average errors per word**
CV	6.25
CVC	3.82
CCV	2.5
CVCC	8.44
CCVC	5.75
CCVCC	5.71
CCVCCC	7
CCCVCC	8.29
CCCVCCC	15

Table 2.1. Average Errors in /l/ and /r/ per Word, Categorized by Syllable Type

Number of errors	**CV**	**IPA**
3	*le*	/l□/
4	*la*	/la/
11	*ra*	/ra/
7	*ree*	/ri/
Total: 25	**Errors/Words**: 25/4	**Average**: 6.25

Table 2.2. Average Errors in /l/ and /r/ per Word, CV Syllable Type

Number of errors	**CVC**	**IPA**
6	*froo*	/fru/
0	*slee*	/sli/
4	*voll*	/vol/
7	*rop*	/r□p/
4	*lom*	/l□m/
2	*gare*	/gær/
6	*snarr*	/snar/
7	*rizz*	/r□z/
0	*jore*	/d□or/
2	*len*	/l□n/
4	*thell*	/θ□l/
Total: 5	**Errors/Words**: 5/2	**Average:** 3.82

Table 2.3. Average Errors in /l/ and /r/ per Word, CVC Syllable Type

Number of errors	**CCV**	**IPA**
3	*dree*	/d□ri/
2	*sloo*	/slu/
Total: 5	**Errors/Words**: 5/2	**Average**: 2.5

Table 2.4. Average Errors in /l/ and /r/ per Word, CCV Syllable Type

Number of errors	**CVCC**	**IPA**
14	*folge*	/fold□/
11	*rems*	/r□mz/
6	*morb*	/morb/
8	*zulled*	/z□ld/
6	*ront*	/r□nt/
7	*nerth*	/n□rθ/
8	*bilb*	/b□lb/
6	*milth*	/m□lθ/
10	*roft*	/r□ft/
Total: 76	**Errors/Words**: 76/9	**Average:** 8.44

Table 2.5. Average Errors in /l/ and /r/ per Word, CVCC Syllable Type

Number of errors	**CCVC**	**IPA**
2	*blem*	/bl□m/
8	*tweer*	/twir/
6	*glip*	/gl□p/
6	*skall*	/skal/
6	*frup*	/fr□p/
7	*quoll*	/kw□l/
0	*trop*	/tr□p/
11	*frep*	/fr□p/
Total: 46	**Errors/Words**: 46/8	**Average:** 5.75

Table 2.6. Average Errors in /l/ and /r/ per Word, CCVC Syllable Type

Number of errors	**CCVCC**	**IPA**
4	*skork*	/skork/
8	*twerve*	/tw□rv/
2	*plosk*	/pl□sk/
12	*stelp*	/st□lp/
2	*flant*	/flænt/
1	*granch*	/grænt□/
10	*thwald*	/θwald/
Total: 39	**Errors/Words**: 39/7	**Average:** 5.71

Table 2.7. Average Errors in /l/ and /r/ per Word, CCVCC Syllable Type

Number of errors	**CCVCCC**	**IPA**
0	plunds	/pl□ndz/
9	*snarked*	/snarkt/
8	*smersk*	/sm□rsk/
10	*spolts*	/spolts/
4	*brunks*	/br□nks/
1	*flisked*	/fl□skt/
8	*twelps*	/tw□lps/
2	*drents*	/d□r□nts/
Total: 42	**Errors/Words**: 42/6	**Average:** 7

Table 2.8. Average Errors in /l/ and /r/ per Word, CCVCCC Syllable Type

Number of errors	**CCCVCC**	**IPA**
4	*squilled*	/skw□ld/
8	*scrooned*	/skrund/
9	*squarth*	/skwarθ/
2	*splench*	/spl□nt□/
9	*squailled*	/skwe□ld/
13	*squirk*	/skw□rk/
13	*splogs*	/spl□gz/
Total: 58	**Errors/Words**: 58/7	**Average:** 8.29

Table 2.9. Average Errors in /l/ and /r/ per Word, CCCVCC Syllable Type

Number of errors	**CCCVCCC**	**IPA**
15	*strills*	/str□lz/
Total: 15	**Errors/Words**: 15/1	**Average:** 15

Table 2.10. Average Errors in /l/ and /r/ per Word, CCCVCCC Syllable Type

Appendix 7

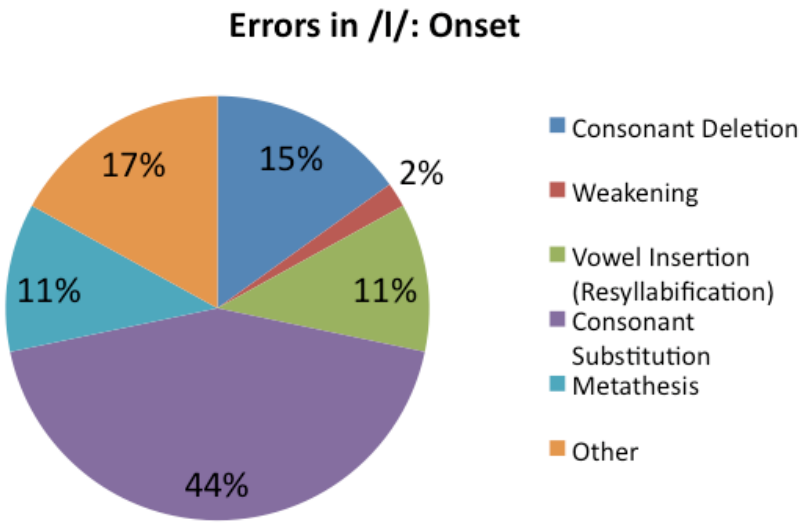

Figure 3.1. Errors in /l/: Onset.

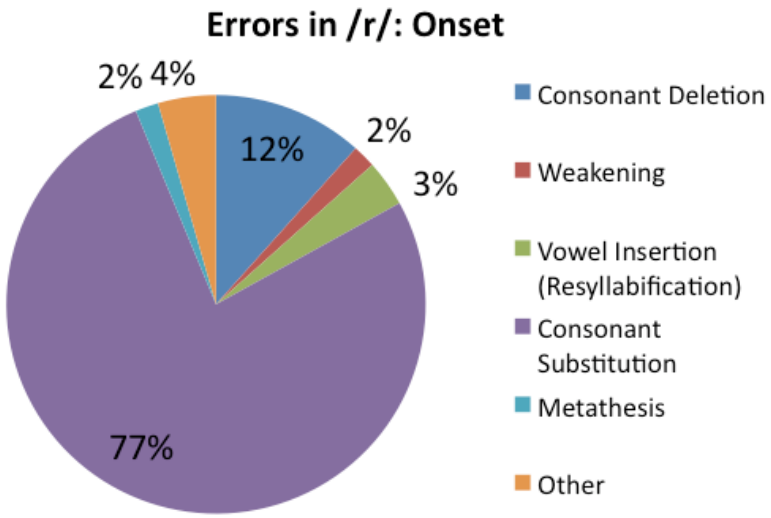

Figure 3.2. Errors in /r/: Onset.

Appendix 8

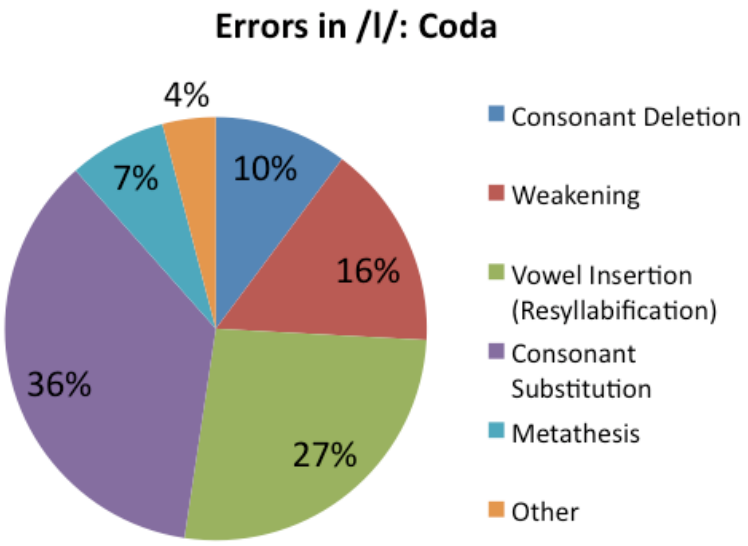

Figure 4.1. Errors in /l/: Coda.

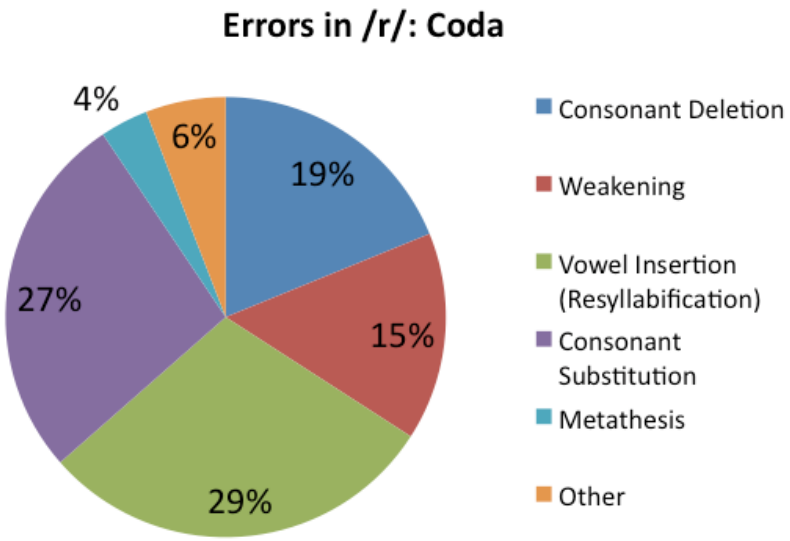

Figure 4.2. Errors in /r/: Coda.