EXPOSING THE IMPORTANCE OF HIDDEN PRONUNCIATIONS IN HANGUL FROM THE LISTENER'S PERSPECTIVE – AN INVESTIGATION OF KOREAN AS A FOREIGN LANGUAGE

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ABSTRACT

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This study investigated the error gravity of Korean pronunciation features as perceived by native and non-native advanced Korean speakers. The investigated phonological processes here are aspirated consonants, fortis articulation, palatalization, nasalization, and lateralization, and addition of [ㄴ] or nasal /n/, both in context and in isolation. A dictogloss-esque activity, coined here as a DictoSpeak, was used to facilitate discussion between a native speaker of Korean and learners of Korean as a foreign language to ensure the occurrence of lexical items involving the target features. The discourse during the DictoSpeak was recorded and rated by native and advanced non-native speakers of Korean to determine the perceived error gravity of the target pronunciation features both in and out of the discourse context. Results suggest students could benefit from instruction on at least four of the processes. Lateralization was found to impact comprehensibility the most, followed by palatalization, nasalization, and fortis articulation. Results imply that lateralization may have a high error gravity to the listeners' ears, and that students can benefit from targeted pronunciation instruction on the phonological processes to improve their comprehensibility.

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Chapter 1 – Literature Review

Pronunciation as a Point of Research

When language instructors are teaching their students, they have the clear goal of molding them into capable language users who are comprehensible by their interlocutors. However, instructors know all too well that class time is often limited, and therefore priorities have to be made when determining what to teach, and even perhaps what not to teach. In some cases, they may be lucky enough to devote time to pronunciation in the classroom, but it is common knowledge that other areas, such as grammar, often take precedence over pronunciation.

Nevertheless, pronunciation has been a point of research in second language acquisition and, in particular, the effects of a learner's mispronunciation has been shown to be an empirical basis for second language instruction in terms of error gravity, which takes into account how different pronunciation features can have differing impacts on comprehensibility and acknowledges that not all errors have the same impact (Munro, 2018). As such, determining the gravity of pronunciation errors as perceived by listeners not only gives insight into the phonology of the language, but also allows for informed and targeted pronunciation instruction in language classrooms and efficient development of useful materials to improve student comprehensibility. As the target language of this study is Korean, there is not much previous research in the literature to draw from. A discussion of error gravity versus other methods of pronunciation error prediction in studies on English will follow in order to justify the use of error gravity.

Error gravity is one way of determining the weight a pronunciation feature holds in terms of comprehensibility. In other words, how much of an impact does it have on the comprehensibility of an utterance from the listener's perspective. It is one of the ways researchers and instructors can inform their research and teaching of pronunciation, as are the functional load hypothesis and the contrastive analysis hypothesis (CAH), which have perhaps been more heavily explored in the literature.

Before considering the impact of a pronunciation feature in terms of functional load, it is necessary for researchers and instructors alike to understand what functional load entails when determining the effect of a pronunciation feature. As highlighted by Brown (1988), functional load can be used by instructors to decide which pronunciation features to focus on in the classroom. As Brown discusses, functional load can be calculated in part by using minimal pairs, although minimal pairs may not account for a feature's entire functional load. In addition to minimal pairs, the cumulative frequency of a feature can also be considered when calculating functional load as a researcher, or when considering what to focus on in the classroom as an instructor. However, as can be gleaned from Brown's description, when determining pronunciations that can impact comprehensibility, functional load looks to the language itself and draws calculations from frequency of pronunciations and their minimal pairs. In a way, this neglects the experience of a listener as it does not consider the impact of the feature from the listener's perspective. In other words, features which are deemed to have a high functional load when rated by listeners could turn out not to have an impact on comprehensibility. Given that, Brown also notes the "simplest expression of functional load," minimal pairs, are not necessarily helpful in determining whether a pronunciation feature will cause a breakdown in communication. Basically, while minimal pairs exist, they may not be all that important to

comprehensibility if they are not so frequent, only contrast a few words, or rarely occur in the same contexts. When considering the language at hand, Korean, many minimal pairs are prevalent, though they are salient orthographically. One such example is 살 [sal] and 쌀 [s͈al], where the former is the lenis form of [s] and the latter is the fortis form of [s] and they mean flesh and rice, respectively. Minimal pairs such as these do contrast meaning in Korean, but as shown above pronunciation differences are obvious in the written form of Korean. For example, ㅅ represents the lenis form and ㅆ represents the fortis form, and as such, simply helping students notice gaps in their knowledge of pronunciation may be sufficient for practicing these pronunciation features. What is more interesting are the non-salient pronunciation features hiding in the Korean orthographic system which cause a change in the pronunciation.

Functional load itself was not empirically tested in the literature until Munro and Derwing explored the principle using judgements of utterances produced by ESL speakers (2006). In this study, the functional load theory, which was proposed by several pronunciation experts, was tested with these judgements on scales of accentedness and comprehensibility. It was found that tokens deemed as high functional load errors had an impact on both scales, and tokens that were deemed as low functional load errors did not have as strong an impact on comprehensibility, suggesting that the functional load hypothesis can be applied as a basis from which to structure pronunciation instruction. This is of importance when the context of Korean as a foreign language is considered given that it is understood that familiarity with accented, or non-native, speech yields higher comprehensibility for that listener (Gass and Varonis, 1984). Instructors teaching Korean as a foreign language may become overly familiar with their students' pronunciation and therefore not be able to determine what a native speaker of Korean would have trouble understanding. Understanding that familiarity leads to higher

comprehensibility means that studies on the impact of pronunciation from the listener's perspective may be more effective if they target non-sympathetic listeners.

Furthermore, it is important to tease apart which segmental features can cause issues with comprehensibility (Munro and Derwing, 1995). It was found that heavily accented speech does not necessarily have an impact on the comprehensibility of an utterance, but that some segmental features did have an impact on ratings and that future studies using functional load following Catford (1987) could explore segmental issues more in-depth. It is also important to note that Munro and Derwing found that there was not always a correlation between accentedness, intelligibility, and comprehensibility, and therefore scales in pronunciation studies should have these categories distinctly separated as heavy accent does not necessarily yield low comprehensibly (and in fact the opposite can also be true). Based on these findings, the current study also uses a 9-point comprehensibility scale, and error gravity as determined by ratings will be used to suggest pedagogical implications beyond what can be gleaned from functional load.

In summarizing functional load, recent studies (Munro and Derwing, 2006) have empirically tested the functional load hypothesis and demonstrated that the functional load principle can be used to guide aspects of pronunciation instruction by determining which pronunciation features impact comprehensibility. However, while work has been done on English to determine the functional load of certain pronunciation features, less commonly taught languages (LCTLs) have not received nearly as much attention (Thomson and Derwing, 2015). Additionally, looking only at frequency and minimal pairs to determine functional load miss out on the actual experiences of the listeners, which is why this study focuses on error gravity as determined by two rater groups, with audio samples providing in-context and isolated utterances of key phonological processes in Korean. Going beyond minimal pairs and looking at error

gravity based on the raters is also important because, as pointed out by Munro, Derwing, and Thomson (2015) similarities in pronunciation errors do not provide a foundation good enough for developing a pronunciation curriculum. Furthermore, the researchers found that while groups with the same L1 could have similar pronunciation difficulties, even then variability was evident. As such, taking a look at pronunciation features from the listener's perspective as this study does can perhaps help to inform which features should be focused on based on comprehensibility ratings from native and advanced non-native speaker raters.

Apart from the aforementioned study, error gravity has also been explored in the context of Swedish speakers learning English. In a book on error gravity in the Swedish context, Stig (1978) pointed out that phonological errors can be more impactful than grammatical errors in terms of comprehensibility, suggesting a need for research on error gravity in phonological features in other languages. Interestingly, Stig also found that judgements of words in isolation were judged more leniently than their in-context counterparts for utterances that were segmental errors and prosodic errors. In some ways, this could be surprising since one might expect that utterances in-context would be judged more leniently because more information provides more opportunity to ascertain meaning. In addition, it was also suggested that learners should be exposed to various target accents that they should aspire to speak since native Swedish speakers had trouble with utterances that were accented. On the other hand, English speakers were able to understand Swedish accents. This could be partly due to the fact that English is used as a lingua franca (Jenkins, 2005; Pickering, 2006) where in fact users of English pride themselves on their use of accented speech and having "native-like" pronunciation is not necessarily the goal as long as their speech is comprehensible. However, this does differ from languages such as Korean which are, as of yet, not used as a lingua franca in a broad sense like English, and therefore

listeners may be more sensitive to variations in pronunciation features. On the other hand, some pronunciation features such as consonants (Sewell, 2017) have been found to have a potential functional load regardless of English being a lingua franca, so it can be supposed that phonological features involving consonants in Korean may also have an impact.

Contextualizing Korean Phonology and KFL

Recently, Korean as a second and foreign language (KSL and KFL) has been looked at in terms of how pronunciation instruction (PI) affects the acquisition of target phonemes. A well-known fact about Korean is that students can sit down to learn to write the alphabet, known as Hangul, in as little as a morning. While on the surface it seems simple to read and pronounce Korean when provided with the corresponding Hangul, the reality is that the written Hangul is often deceptive, with the actual pronunciation of many words and sentences differing from their Hangul representations. Essentially, the true pronunciation of a word in Korean is often hidden within the spelling which causes L2 learners to make pronunciation errors. In other words, learners who take the character-set at face value in all instances will have pronunciation issues. For example, learners often erroneously pronounce a common word such as beverage as /ʊm ljo su/ rather than /ʊm njo su/. This is because the spelling of the word 음료수 looks like the latter when in actuality the correct pronunciation is that of the former. Learners unaware of phonological processes in Korean assume that ㄹ would just be pronounced as /l/ or / ɾ/ when the phonological process of nasalization in Korean actually changes the ㄹ to a nasal ㄴ, or /n/, sound when it appears next to the voiced bilabial ㅁ, or /m/. Given this phenomenon, this study

aims to explore those pronunciation features and rank their importance. By shining a light on these sounds in disguise, the main goal of this study is to identify which pronunciation features have a high error gravity. The clear pedagogical implication is to help Korean language instructors determine which pronunciation features they should make their students aware of using the rater's perspectives as a model, rather than using learner L1 as a guessing point for pronunciation errors. It is also possible that results could have implications for functional load in Korean, but at present there is no literature on functional load in terms of these phonological features in Korean.

Investigating error gravity may also have implications for the functional load of Korean pronunciation features. Functional load has received much attention in the literature when it comes to English; not so for other languages such as Korean. Despite this, explorations undertaken about English can be used as the basis for studies on less-commonly taught languages such as Korean. As mentioned, Munro and Derwing (2006) did find that high functional load errors caused more issues in comprehensibility for their raters than did low functional load errors, and it is possible that errors with a high gravity could also correlate with high functional load. In an article by Brown (1988) varying views on functional load were discussed. In it, Brown discusses the "simplest expression of functional load," minimal pairs, and how they are not necessarily helpful in determining whether a pronunciation feature will cause a breakdown in communication. Basically, while minimal pairs exist, they may not be all that important to comprehensibility if they are not so frequent, only contrast a few words, or rarely occur in the same contexts. Korean also has minimal pairs, however, many of them are salient and can be predicted by learners by looking at the written representation of the word. One such example is 살 [sal] and 쌀 [s̬al], where the former is the lenis, or not tense, form of [s] and the latter is the

fortis, or tense, form of [s] and they mean flesh and rice, respectively. These sorts of minimal pairs do contrast meaning, but as shown above pronunciation differences are obvious in the written form of Korean. For example, ㅅ represents the lenis form and ㅆ represents the fortis form, and as such, simply helping students notice gaps in their knowledge of pronunciation may be sufficient for practicing these pronunciation features. What is more interesting are the many non-salient pronunciation features hiding in the Korean orthographic system which cause a change in the pronunciation. For this study, I will be focusing on phonological processes related to consonantal changes as most phonological features in Korean are consonantal. Korean orthography is based on its phonology, as mentioned above, and there are many features of Korean pronunciation, that are not salient in the written form. Processes such as fortis articulation, palatalization, nasalization, lateralization, and /n/ assimilation can all be pitfalls for L2 Korean learners in terms of their comprehensibility to native Korean speakers.

Defining the Phonological Processes

The phonological processes in question are defined as they are in the *Korean Pronunciation Guide* (Kim et al, 2017). For clarity, the phonological processes' English and Korean names will be included here. Aspirated consonants, or 격음화, occur when consonant sounds become aspirated within a word. This occurs when consonants interact and become aspirated versions of themselves. A common example is when consonants such as /k/, /t/ and /tɕ/ (ㄱ, ㄷ, and ㅈ respectively) occur after /h/ (ㅎ) where they become aspirated versions of themselves. Therefore, the word *how* is pronounced as /ʌt̪ʌkʰe/ (어떻게), where the final

consonant is aspirated. Given that ㄱ is often transcribed as /g/ *or* /k/, students may make the mistake of not aspirating this word in their speech. While this example is relatively salient, other instances of aspiration are hidden in the orthography. For example, consonants /s/, /tɕ/, /t̪ɕ/ and /tʰ/ all manifest as aspirated tʰ when they meet two conditions: they are the final consonant in a syllable and appear before /h/. Therefore, the word for *cannot do (something)* 못해요 is realized as /motʰejo/ and not /mosejo/. The /s/ ㅅ here undergoes aspiration based on its point of articulation and becomes ㅌ /tʰ/.

Fortis articulation, or 경음화, is the process where consonants become tense versions of themselves. This occurs most often when two consonants appear right next to each other in a word. Examples include *restaurant* 식당 /sikt̪aŋ/ and *person who will go* 가실 분 /kasilp̪un/, where /t/ and /pʰ/ become tense, respectively.

Palatalization, or 구개음화, is the process by which /t/ ㄷ and ㅌ /tʰ/ become either /tɕ/ or tɕʰ/. If /t/ occurs in front of /i/, it becomes /tɕ/. Likewise, /t/ will become /tɕʰ/ in front of /hi/, such as in the word *closed* (when it will be *closed*): 닫힐 때 /tatɕʰilt̪e/. In a similar manner, /t/ changes to /tɕʰ/ in front of the /i/ vowel. Students are often exposed to this early on in a common word such as *together* 같이 /katɕʰi/. This process can also occur in front of the palatal glide /j/, for example in the statement *something is closed* 문이 닫혀 있어요 (literally: *the door is in a state of being shut*), where 닫혀 is realized as /tatɕʰjʌ/.

Nasalization, or 비음화, manifests in various situations in Korean. It occurs when the velar consonant /k/ ㄱ combines with nasal consonants, when the alveolar consonant /n/ ㄴ combines with nasal consonants, and when the bilabial consonant /p/ ㅂ combines with nasal consonants. For example, in the word *last year* 작년 students may incorrectly pronounce the /k/ without nasalization, uttering /tɕaknjʌn/ rather than /tɕaŋnjʌn/. In this process, the /k/ sound becomes a velar nasal /ŋ/. Nasalization also occurs with the /l/ sound in Korean, ㄹ. In this case, when ㄹ is preceded by the bilabial /m/ ㅁ or velar /ŋ/ ㅇ, the /l/ undergoes nasalization and is pronounced as /n/. This occurs in common words such as *beverage*, 음료수 /ʊ̃mnjosu/ and coworker, 동료 /toŋnjo/. This process also occurs when bilabial /p/ ㅂ is followed by a nasal, such as the formal word for *is,* 입니다 /imnita/. Here, the bilabial ㅂ undergoes nasalization and is pronounced as ㅁ in front of nasal /n/ ㄴ.

Lateralization, or 유음화, occurs when the liquid consonant /l/ ㄹ is in front of the nasal /n/ ㄴ, and when /n/ is followed by /l/. It is a unique process that occurs between ㄴ and ㄹ when one is in the final consonant position (known in Korean as *batchim* 받침 position) and the second consonant directly follows. Examples include common words such as *convenient*, 편리 /pʰjʌlli/ and *groom/husband* 신랑 /sillaŋ/.

The final process to be explored is addition of /n/, or ㄴ 첨가. This is a unique Korean phonological process wherein an /n/ sound is added. This occurs when /n/, /m/, /k/, /t/, /p/, and

/ŋ/ occur in front of /i/, /ja/, /jʌ/, /jo/, and /ju/. This change can also occur across word boundaries. An example students learn from the *New Sogang Korean* textbook series in level 1 is *headache/migraine medication,* 두통약 /tutʰoŋnjak/, where /n/ is added between 통 /tʰoŋ/ and 약 /jak/. Another example students learn early on is *what day (is it)*, 무슨 요일 /musʊn njoil/, where /n/ is added between 슨 /sʊn/ and 요 /jo/. As can be seen from these examples, the Korean orthography is not salient in terms of these phonological processes which can cause students to mispronounce if they say the words exactly as they are spelled.

Perhaps one of the most interesting points when discussing the Korean orthography is that sound-letter relationships, in general, are regular, unlike in English where these relationships do not always align (Nam, 2018). Given this, Nam stated that following the Orthographic Depth Hypothesis, Korean would therefore be classified as a shallow orthography since the mapping of the letter to sound relationship is consistent. In that study, the researcher focused on children's awareness of the relationship of phonology with spelling in both English and Korean, and found that children were aware of the syllable-level units of spelling in Korean. An interesting finding from this qualitative study was that the children reported that Hangul was easier to learn to write than English due to spelling. This differs from the present study in two main ways: first, this study focuses on adult learners of Korean as a foreign language who have already learned the orthography, and second, this study focuses on parts of the Korean orthography that could be considered deep orthography. Certain phonological processes in Korean are not pronounced as they are spelled, which can lead adult learners of Korean as a foreign language to mispronounce such words if they rely solely on the spelling.

Pronunciation acquisition by adult learners of Korean has received some attention in the literature. A recent study by Isbell et al. (2019) conducted at a large American university found that pronunciation instruction (PI) was most effective for learners with well-established L2 pronunciation, and this was attributed to the fact that beginners who underwent PI exhibited global improvement regardless of whether or not they received explicit pronunciation instruction. In that study, first- and second-year Korean language students received pronunciation instruction, but the instruction was only considered beneficial for the second-year students who were able to improve their existing pronunciation; first-year students showed similar improvements even if they did not receive PI. There is a very distinct sound-spelling relationship in Korean which has been brought up in other studies. One such study by Kim and McDonough (2008) explored the interlocutor effect, or the way in which an advanced/native speaking interlocutor and a learner deal with and resolve language related issues in communication. The participants were KSL students in Korea. It was found that learners did discuss pronunciation in language related events and conversation breakdowns. This, again, was potentially due to the sound-spelling relationship in Korean. However, as mentioned previously, the orthography is not salient in terms of the phonological processes in question for the present study. Furthermore, in another study the Korean intervocalic liquid consonant was found to pose an issue for learners. While this could be in part due to the nature of the Korean flap, it could also have to do with the characteristics of the Korean orthography (Kim & Park, 1995). As this study was conducted in Australia, it is plausible that results would be similar in a replication in the United States university context.

Phonological issues were also explored as an element of some Korean textbooks written for adult learners, but in that study only half of the analyzed textbooks featured phonological

content despite the importance of pronunciation being acknowledged by Korean textbook writers (Yi, 1999). It was further found that textbooks that focused on pronunciation worked at raising an awareness of plain and tense consonants (such as the rice/flesh example previously mentioned) through the use of minimal pair drills. Pronunciation in textbooks was also found to be used more as a way to teach grammar and conversation instruction than anything else, and if pronunciation was focused on it was at the segmental level. Given that phonological processes in Korean appear to be overlooked in instructional materials, the present study aims to offer an understanding as to the impact of these phonological processes and perhaps suggest their instruction in addition to segmental sounds.

While pronunciation features of Korean can indeed be pitfalls to learners, each feature's impact on comprehensibility should be explored to determine what teachers of Korean as a second and foreign language should focus on in their classrooms. According to the intelligibility principle, learners need only to be understood by native speakers of the target language, and that being native-like in their speech is not necessary provided their speech is understandable (Levis, 2005). The intelligibility principle argues that different pronunciation features have varying impacts on the understandability of an L2 speaker's speech. This is in-line with the aforementioned study by Derwing and Munro (2006) which explored the validity of the functional load hypothesis. The data from that study support the notion that understanding the functional load of a pronunciation feature is important in determining its importance. In terms of pedagogy, this suggests that high functional load features should receive emphasis in classroom pronunciation instruction, and garnering learner awareness of which features are important during discourse is key to fostering confident, proficient speakers of a second language.

The study in question: Error Gravity and Phonological Processes in Korean

In order to investigate potential error gravity of phonological processes in Korean, this study was conducted to explore the non-salient pronunciation features of Korean, namely: fortis articulation, aspiration, palatalization, nasalization, lateralization, and [ㄴ] assimilation (which will be referred to as addition of /n/). This study explores the potential error gravity of these features and expands on the current understanding of their importance in pronunciation instruction by determining their potential error gravity in isolation and in the discourse context of the uttered sentence. Based on studies mentioned above that found evidence suggesting that PI is effective at the intermediate level and that error gravity can provide a framework from which to base pronunciation instruction, this study was conducted with the goal of adding to the field of second-language pedagogy by suggesting what aspects of Korean pronunciation should be focused on in classrooms. The research questions are as follows:

RQ1: Which orthographically non-salient phonological processes of Korean have high- and low-error gravity in terms of comprehensibility as rated by native and non-native speakers?
RQ2: Does context play a role in the perception of comprehensibility of tokens of the selected phonological processes in Korean?
RQ3: Do raters who are native Korean speakers differ in their determination of high- and low-error gravity when compared with raters who are non-native advanced Korean speakers as determined in their ratings of the audio samples?

Chapter 2 – Methods

Participants – Students

The target population for this study is Korean as a foreign language (KFL) students. This distinction is important as one of the goals of this study is to explore the distinct second language acquisition patterns of certain phonological processes in the Korean as a foreign language population, and not the Korean as a second language (KSL) population. Given that Korea's place in the world as a global economic power is growing, naturally so is the number of Korean learners outside Korea. This is a result of other Korean exports garnering interest in the country and culture, so it is necessary for instructors outside Korea to understand how learners in their learning context acquire Korean.

The target level of this study is the novice-high to intermediate-mid level on the ACTFL scale. This range represents students in lower level Korean courses at the university in the United States where data collection took place. The level of the students was either determined by an in-house placement test or from their course level in the program. To select a representative sample, 10 students were recruited from lower level courses. The number of participants needed to be low because each participant generated over 700 audio files to be rated. Participants were compensated by receiving course credit for participating in the study. The course credit was denoted as one of the five required out-of-class extracurricular Korean language activities that students are required to participate in. Participants were compensated with feedback on their own performance at the time of the activity and on the ratings and data analysis of the phonological processes in question.

Participants – Native Speaker Interlocutor & Raters

Raters were recruited to rate audio samples of the phonological processes both in isolation and in a discourse context. In total, there were two groups of raters: Korean native speakers, and advanced Korean as a second language speakers whose first language is American English. In order to be recruited as an advanced non-native Korean speaking rater, the individual must have completed at least four years of Korean study and had experience using Korean professionally. Recruited individuals also had a conversation with the researcher in Korean to determine their speaking ability. The advantage of having these two groups is that the results could yield information as to not only the impact of certain phonological processes on comprehensibility to a native ear, but also give insight into how advanced speakers perceive the same processes.

The recruiting process for native speakers was markedly modern – all participants were recruited from advertisements on the social media application Instagram. Advertisements for recruiting were posted in English and Korean with information about what the tasks would entail. In total, four native speakers were recruited for ratings, and one native speaker was recruited to serve as the interlocutor students would work with during data collection. The interlocutor was compensated at $US 15 per hour, and raters were compensated at $US 12.50 per hour.

Materials: Developing a Language Elicitation Activity – The DictoSpeak

For the purposes of developing an activity that would elicit enough tokens in spontaneous speech, an activity that resembles a dictogloss was developed – coined here as a DictoSpeak. The inspiration to use such an activity was based on a study by Kim and McDonough (2008), where lower and higher-level Korean language students successfully completed a dictogloss activity for data collection. However, unlike a dictogloss activity where students are required to rewrite a read passage, this DictoSpeak activity required students to simply discuss a passage they had read with a native speaker, using at minimum the keywords from the passage. The target was to collect at minimum three tokens of each process in isolation and in-context, but in many cases, students produced more than the minimum required through their conversation with the native speaker interlocutor. The keyword list given to the students after reading the passage included key terms that they could refer to while discussing to aid their recall of the passage. In some instances, terms were glossed if they were not previously taught based on the course syllabus.

Given that the target population is learners of Korean as a foreign language at a large Midwestern university in the United States, the vocabulary and grammar used in the DictoSpeak passage and keyword list was designed with the goal of being similar to what students had been exposed to, but also challenging so that it would in turn become an activity that would be educational and beneficial for the student who participated.

Korean language courses at the university use the New Sogang Korean (Kim, 2008) series of textbooks. These textbooks, particularly at the lower level, are developed with the goal of helping students become communicative in Korean. As such, chapters are divided into themes, such as vacationing, inviting friends to see a movie, and traveling using public transportation.

Each chapter is used as the foundation to teach a grammar point, or key vocabulary. Given the range of topics covered in the series of books, the DictoSpeak passage itself was designed to include grammar points and vocabulary that students would have been exposed to in class, albeit the DictoSpeak passage was longer than most of the texts the students were familiar with. Nevertheless, the grammar, vocabulary, and story were designed to be level appropriate.

The Role of the Interlocutor

To elicit spontaneous speech from the students, a native Korean speaker was recruited to serve as the interlocutor in the study. The interlocutor's role in the study was to discuss the passage that the student read, which in turn would help the student to expand on what they had read and ensure that a sufficient number of utterances featuring phonological processes were produced. The interlocutor's role was not to ensure that student's retelling of the story was perfect and included every point; the emphasis was placed on making sure they produced the target phonological processes regardless of whether their retelling or understanding of the story was accurate. As such, the interlocutor was provided with the DictoSpeak passage and the DictoSpeak keywords list as a reference during the study. The interlocutor was trained in a practice run of the DictoSpeak activity with the researcher.

Upon completion of the study, the researcher, interlocutor, and learner would go over any questions the student had about the passage in their preferred language (English or Korean) which added to the value of the study as a learning opportunity for the students in the program who participated.

Chapter 3 – Data Analysis and Results

Preparation of Data for Ratings and Analysis

The sessions were recorded and resulted in audio files ranging from 12-30 minutes in length. In preparation for rating, each recording was cut and edited to include target tokens in isolation and in their discourse context. These files were labeled for the following: token, context, and process. For clarification, these will be defined below.

A token is the word uttered which included the target phonological process. So, for example, if the word was *museum* that would be marked in the file name in a way that is transparent only to the researcher. Context refers to whether the audio file includes the word in isolation or the word in the sentence in which it was uttered. To achieve the effect of raters hearing a word in isolation and then in the context, a sentence uttered by a learner was edited twice. First, the audio file with the word in isolation was edited so that only the word was audible. Second, the audio file including the sentence in which the word was uttered was edited so that the rater would hear the word in the context. Care was taken to ensure that the native speaker interlocutor's voice was not audible. The interlocutor was trained to not talk over the participant so that his voice could be easily separated from that of the participant. The voice of the interlocutor was not included in the audio recordings to avoid any potential interaction between a rater's rating and hearing a native speaker in context with non-native speech. An example of a sentence uttered by a learner is below. In this utterance, the target utterance is originally (원래) which undergoes lateralization:

English translation: Seungri originally lived in Korea.

Utterance in Hangul: (승리 씨가) 원래 한국에서 살았어요.

Phonetic transcription: (/sʊŋnɪ: s̬i kɑ) wəllæ hɑŋkukɛsə sɑrasʷəjo)

From this utterance, the target token originally was edited so that the rater would hear it first in isolation. Following that, the rater would hear the utterance in the context of the sentence. Both files were rated for comprehensibility on a scale of 1 to 9, where 1 = not comprehensible and 9 = extremely comprehensible.

The edited audio files were organized chronologically in the order they were spoken, with files of isolated speech being immediately followed by the same speech in context. By organizing the files in this manner, raters were rating each utterance first in isolation and then in context.

Procedure — Ratings & The Rating Process

The online rating system was set up using a shareable Google Drive. The main advantage of using Google Drive was that it allowed for ratings to be completed by raters remotely, and the researcher was able to monitor the time it took to complete ratings. All audio files were uploaded to the Google Drive in order of student and labeled numerically. For each rater, a Google Spreadsheet was created in tandem with the audio files stored online to serve as the rating system. Raters were instructed to input ratings for comprehensibility on a 9-point scale, and to leave comments on a file only if they felt it would be helpful for the researcher to understand

their rating. Once all ratings were completed, the Google Spreadsheet was converted to a Microsoft Excel file from which ratings were sorted and further analyzed.

Procedure – Data collection

The data collection occurred over a period of two months. During this time, the participants signed up for a time to participate in thirty-minute blocks. Following this, the researcher would introduce the participants to the native speaker interlocutor. The participant and the interlocutor would exchange greetings and conduct brief self-introductions in Korean. Following this, the participant was given the DictoSpeak passage to read. Each participant was given seven minutes to read the passage. After reading the passage, the researcher exchanged the passage for the keyword list. Much like a dictogloss, the keyword list includes terms in the order in which they appear in the passage. The student would be allowed to reference this during the discussion with the interlocutor. The researcher would then leave the interlocutor and the participant in the room to discuss the passage. In the case of very fluent students, the interlocutor allowed the student to guide the conversation, strategically intervening to ensure that the student used words that were tokens of the phonological processes in question. If a student was less talkative, the interlocutor would help guide the conversation. The audio was recorded on a 2018 MacBook Air using the QuickTime application.

Preparation of the Ratings Data for Analysis

The ratings data from the original Google Spreadsheet files were downloaded and converted to Microsoft Excel files, from which the data were accessible for analysis in SPSS. Those excel sheets were used to organize the data based on rater, process, and context.

Results of Data Analysis

In this section the data analysis procedure will be outlined, and results will be presented for the comprehensibility ratings provided by the native Korean speaking raters and advanced non-native Korean speaking raters. Comprehensibility ratings have been shown to be generally reliable when rated by speakers (Munro and Derwing, 1995) and to be a good indication of comprehensibility. Comprehensibility can be considered the gold standard for language learners as heavy accent has not been shown to always correlate with comprehensibility (Derwing and Munro, 1997). As such, comprehensibility ratings were collected and analyzed for the target phonological processes. Those results are discussed in this section.

Comprehensibility Assessment by Native Speaker Raters

Intra- and Inter-reliability

Intra- and inter-rater reliability was calculated using intraclass correlation coefficient. Intra-rater reliability was calculated in the present study to ensure that raters were being

consistent given that the rating task was quite long at over 700 files. It was also calculated to ensure that raters were consistent over a period of time, as some raters took longer than others to complete the ratings. Raters were highly reliable within themselves, with three out of four raters receiving a Cronbach's alpha of above .900. The intra-rater reliability calculations are listed in Table 1 below. It should be noted that Rater 3 stands out with a lower intra-rater reliability score. This could be due to the fact that he tended to use the extreme ends of the scale with more ratings of 1 and 9 than the other raters.

Table 1.

Intra-rater Reliability for Native Speakers

Rater	Intra-class Correlation Coefficient
Native Rater 1	.937
Native Rater 2	.957
Native Rater 3	.769
Native Rater 4	.926

Inter-rater reliability was calculated for each phonological process in both isolated and in-context conditions. Inter-rater reliability calculations are listed below in Table 2, where the variability in reliability ratings can be seen. Note that reliability coefficients for isolated utterances of addition of /n/, nasalization, and palatalization are lower. Likewise, the coefficient for in-context utterances of addition of /n/ is also lower. Overall, reliability scores improve when these utterances are heard in-context. This could be due to the phonological process' impact on comprehensibility in isolation making it hard for raters to understand what the student was trying to say, and therefore not being sure of how they should rate an utterance. This could have resulted in lower reliability for utterances in isolation as there was more variation in this level. This is supported by the fact that reliability scores improved for tokens in-context, suggesting

that the raters were able to figure out the word that the student was trying to say when they heard it in a sentence.

Table 2.

Inter-rater Reliability for Native Speakers

Phonological Process	Isolated	In-context
Addition of /n/	.566	.615
Aspiration	.721	.852
Fortis Articulation	.729	.748
Lateralization	.793	.873
Nasalization	.570	.816
Palatalization	.504	.723

The descriptive statistics for this data set can be found in Table 3 below, divided by process and context. Notice how the mean ratings for each process increased when the utterance was heard in-context. Also note that scores were in general quite low for the native speaker rater group, with the highest average rating being 5.71 for addition of /n/ in context.

Table 3.

Descriptive Statistics for Native Speaker Ratings of Learners' Comprehensibility in Korean

Phonological Process	Condition	Mean (SD) [a]	95% Confidence Interval
Addition of /n/	Isolated	5.57 (0.81)	4.99, 6.14
	Context	5.71 (0.75)	5.18, 6.25
Aspiration	Isolated	5.36 (0.97)	4.66, 6.05
	Context	5.62 (0.90)	4.97, 6.26
Fortis articulation	Isolated	5.03 (0.72)	4.52, 5.55

Table 3 (cont'd).

	Context	5.63 (0.74)	5.11, 6.16
Lateralization	Isolated	4.53 (0.85)	3.92, 5.13
	Context	5.60 (0.81)	5.02, 6.18
Nasalization	Isolated	5.03 (0.80)	4.45, 5.60
	Context	5.67 (0.78)	5.11, 6.24
Palatalization	Isolated	4.92 (0.89)	4.29, 5.60
	Context	5.65 (.75)	5.12, 6.19

[a]Measured on a scale from 1 to 9, where 9 is highly comprehensible.

Inferential Statistics for Native Speaker Raters

A two-factor within-group ANOVA was conducted. Independent variables were phonological processes (6 levels: addition of /n/, aspiration, fortis articulation, lateralization, nasalization, palatalization) and condition (2: isolated, context). The dependent variable was the comprehensibility ratings. The results of the test of within-subject effects ANOVA suggest that there is a main effect of both process and context on comprehensibility to the ears of native speaking raters. These two levels are first discussed separately based on the results of the ANOVA and pairwise comparisons. Following that, simple effects tests are discussed to describe interactions between the levels of process and context.

There was a significant effect of process, $F(5, 45) = 5.259$, $p = .001$, partial eta squared = .369. This finding suggests an overall significant main effect of process in terms of its effect on comprehensibility. Pairwise comparisons with Sidak adjustment for multiple comparisons revealed that comprehensibility ratings for addition of /n/ significantly differed from those for lateralization ($p = .038$), and comparison of ratings for fortis articulation approached significance

(p= .076). These results indicate that errors in pronouncing lateralization tokens are much harder for native speakers to comprehend than are errors in addition of /n/ or fortis articulation.

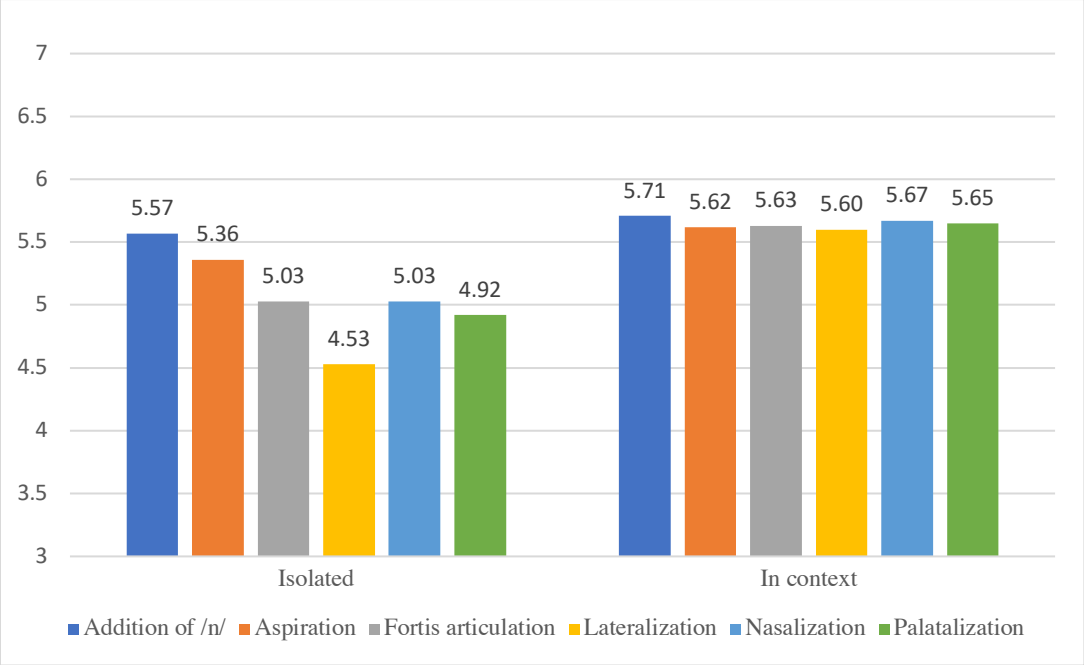
There was also a significant effect of context, $F(1, 9) = 34.494$, p= .000, partial eta squared = .793. Comprehensibility ratings for tokens evaluated in context were significantly higher than the ratings of their isolated counterparts. Here, the partial eta squared value is higher for context than that of process, which suggests that context has a higher effect size than process. Pairwise comparisons between the two levels of context yielded a significance value of p= .000, confirming that context has a significant effect on comprehensibility to native speakers. The fact that context impacts comprehensibility is also apparent when the mean score from the isolated condition of 5.074 is compared with the in-context mean score of 5.694. Processes in isolation exhibit variation in ratings, whereas processes in-context are rated similarly by native speakers, with those mean scores being higher and more clustered than those in isolation.

There was also a significant Process by Context interaction, $F(5, 45) = 6.274$, p= .000, partial eta squared = .411. A test of simple effects with Sidak adjustment for multiple comparisons identified two areas of significance with isolated condition involving the addition of /n/ process. Based on these results, simple effects tests were conducted to determine the effect size of the phonological processes exhibiting a main effect. Based on the simple effects test, it appears that the main effect of process on comprehensibility is in the isolated condition. The isolated condition also shows the most variation between process comprehensibility ratings. The simple effects test reveals that native speakers have the least trouble comprehending tokens involving an addition of /n/ out of context, and they understand such utterances similarly across both conditions. Overall, addition of /n/ was easier to understand in isolation than lateralization

($p = .017$), as well as fortis articulation ($p = .004$). The bar graph in Figure 1 below visually illustrates these interactions. Note the mean difference between addition of /n/ when compared with lateralization and fortis articulation. Also note the variability in the level of process is confined to the isolated context.

Figure 1.

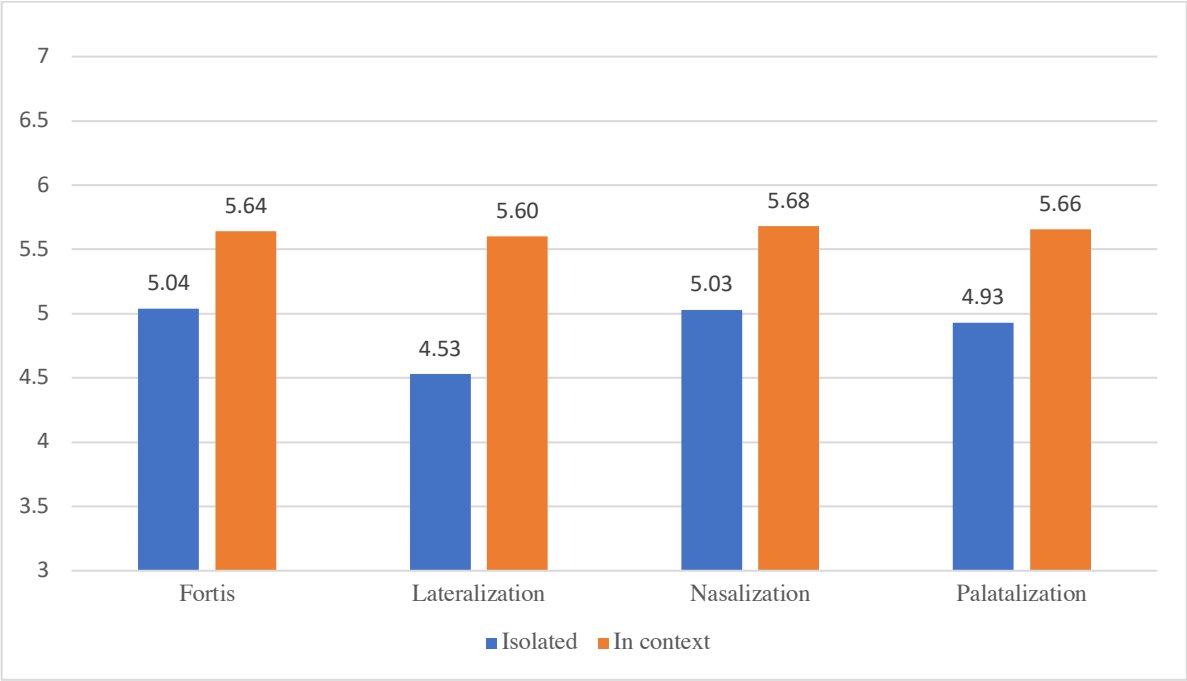
Native Speaker Ratings - Processes by Context



A second simple effects test was conducted to explore the interaction between process and context. Significant comparisons between the levels of context and process were found for fortis articulation ($p = .001$), lateralization ($p = .000$), nasalization ($p = .009$), and palatalization ($p = .006$). The relationship between these processes and the level of context is visually represented in Figure 2 below. Note the variation in ratings of each process considering the levels of the condition factor.

Figure 2.

Simple Effects Test II - Effect of Context for Native Speaker Ratings



Comprehensibility Assessment by Non-Native Speaker Raters

Intra- and Inter-reliability

Intra- and inter-rater reliability was calculated using intraclass correlation coefficient. Raters were highly reliable within themselves, with two out of three raters receiving a Cronbach's alpha of at least .800. The intra-rater reliability calculations are listed in Table 4 below.

Table 4.

Intra-Rater Reliability for Non-Native Speakers

Rater	Intra-class Correlation Coefficient
Non-Native Rater 1	.940
Non-Native Rater 2	.802
Non-Native Rater 3	.933

Inter-rater reliability was calculated separately for each phonological process and condition. These coefficients are shown below in Table 5. It can be noted that these reliability coefficients are generally higher in the isolated condition, meaning non-native speakers rated samples more similarly in the isolated condition than the in-context condition. Additionally, these coefficients are lower in the in-context condition than they were for the native speakers.

Table 5.

Inter-Rater Reliability for Non-Native Speakers

Phonological Process	Isolated	In-context
Addition of /n/	.722	.712
Aspiration	.734	.675
Fortis Articulation	.582	.633
Lateralization	.684	.579
Nasalization	.670	.708
Palatalization	.819	.837

The descriptive statistics in the following table are separated by process and context. Notice how the means are more tightly clustered for the non-native rater group than they were

for the native rater group. Also note that here we see higher and more tightly clustered mean scores than the native rater group.

Table 6.

Descriptive Statistics for Non-Native Speaker Ratings of Learners' Comprehensibility in Korean

Phonological Process	Condition	Mean (SD) [a]	95% Confidence Interval
Addition of /n/	Isolated	6.85 (0.60)	6.42, 7.29
	Context	7.10 (0.66)	6.62, 7.57
Aspiration	Isolated	6.85 (0.78)	6.29, 7.29
	Context	6.92 (0.78)	6.36, 7.47
Fortis articulation	Isolated	6.67 (0.77)	6.44, 7.22
	Context	6.96 (0.74)	6.44, 7.49
Lateralization	Isolated	6.12 (1.04)	5.38, 6.87
	Context	6.83 (0.76)	6.30, 7.37
Nasalization	Isolated	6.64 (0.85)	6.03, 7.25
	Context	7.01 (0.74)	6.48, 7.53
Palatalization	Isolated	6.40 (1.14)	5.58, 7.21
	Context	7.20 (0.60)	6.77, 7.62

[a]Measured on a scale from 1 to 9, where 9 is highly comprehensible.

Inferential Statistics for Non-Native Speaker Raters

A two-factor within-group ANOVA was conducted. Independent variables were phonological processes (6: addition of /n/, aspiration, fortis articulation, lateralization, nasalization, and palatalization) and condition (2: isolated, context).

Here, the overall main effect of process was found to be non-significant, $F(5, 45)= 1.804$, $p= .131$, partial eta squared = .167. However, the mean difference between ratings for utterances

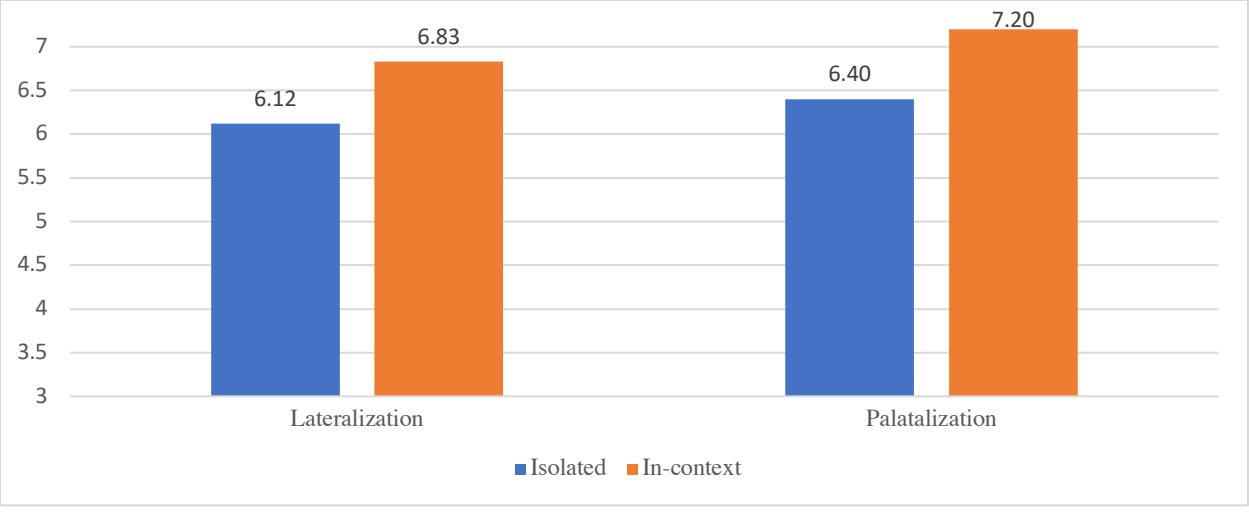
featuring addition of /n/ and lateralization did reach significance, with the results of the pairwise comparisons adjusted for Sidak yielding a significance of $p = .037$.

There was a significant main effect for the level of context, $F(5, 45) = 48.679$, $p = .000$, partial eta squared = .844. Mean comprehensibility ratings were higher for speech samples presented in context.

A test of simple effects was conducted to check for interactions on the level of process, however, there were no significant comparisons in this condition. A second simple effects test was conducted to explore potential interactions between the two levels of the context factor from within each phonological process. The results were that significant comparisons were found between the two levels of the context factor for lateralization ($p = .000$) and palatalization ($p = .005$). Two other processes approached significance: fortis articulation ($p = .052$) and nasalization ($p = .057$). The graph in Figure 3 below shows the significant relationship of context by process for lateralization and palatalization.

Figure 3.

Simple Effects Test II – Effect of Context for Non-Native Speaker Ratings



Chapter 4 – Discussion

As Korean becomes a more commonly taught language in the United States it is apparent that Korean instructors need to understand the needs of this particular foreign language population. First language aside, students' possible exposure to Korean in the context of universities in the United States is inherently different from that of learners in Korea learning Korean as a second language. While there are many aspects of Korean that learners can find troublesome in their studies, pronunciation is often a factor that can impede second language learners' ability to simply get their point across when conversing with native speakers. Korean in particular has a handful of distinct phonological processes, six of which are explored here, that can impact a learner's comprehensibility. What is particularly interesting in the case of Korean, and a potential pitfall for the learning, is that learners generally first study the Korean phonetic alphabet, known as Hangul. While Hangul is a phonetic alphabet, the phonological processes in question are not salient in that if a learner were to pronounce the words exactly as they are written they would exhibit a characteristically L2 pronunciation error.

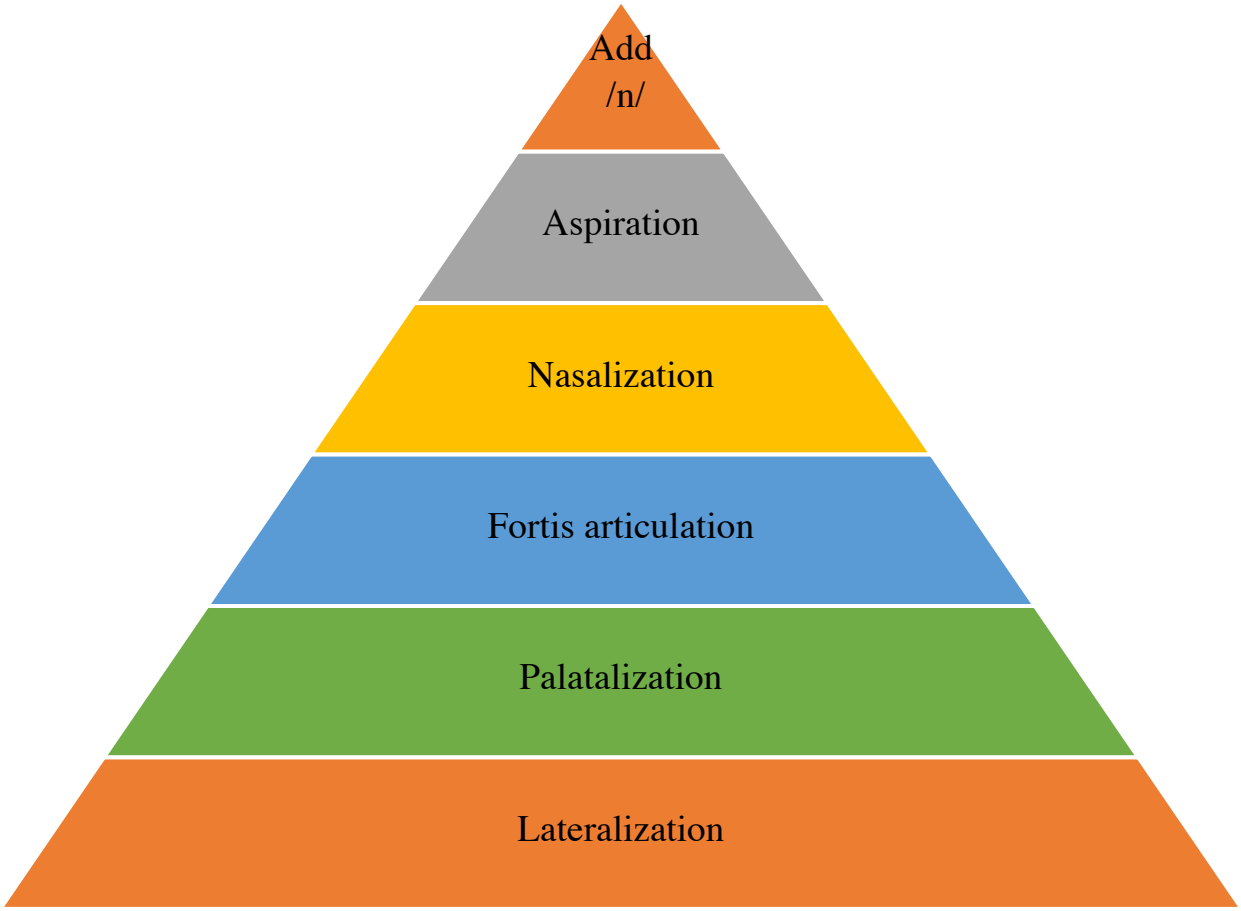
As such, the ultimate goal of this study was to determine the error gravity of orthographically non-salient phonological processes in Korean based on the six levels of process, and the two levels of context. Looking at the differences in the ratings and analysis of the ratings provided by the two rater groups can reveal whether or not the native and advanced non-native speakers are impacted differently by the phonological processes. The short answer to this question is, yes, it appears that the various phonological processes researched in this study have an impact on comprehensibility, and therefore potential error gravity and functional load.

Establishing an Impact Ranking of Process

With the goal of outlining an impact of the Korean phonological processes with a basis in error gravity theory, the ratings were used to establish the following hierarchy: lateralization has the greatest impact on comprehensibility of speech, followed by palatalization, fortis articulation, nasalization, aspiration, and finally addition of /n/ across word boundaries. While there was some variation between native and non-native raters between nasalization and fortis articulation, the difference in mean scores was extremely slight. As such, the potential error gravity is demonstrated in the following pyramid graph. By using a pyramid, we are suggesting that the process at the bottom carries the most weight, or impact, therefore it is pulled to the bottom by error gravity. Scores shown are the mean scores provided by the native speakers. Lower mean scores represent a lower comprehensibility on the 9-point scale, where 1 corresponds with not comprehensible and 9 corresponds with extremely comprehensible. As can be seen in the pyramid below, lateralization placed at the bottom as it received the lowest mean score, followed by palatalization, fortis articulation, nasalization, aspiration, and finally addition of /n/.

Figure 4.

Error Gravity Pyramid



Note: Lower mean score represents a potentially higher error gravity as a low score corresponds with low comprehensibility, 1 = not comprehensible and 9 = extremely comprehensible. Mean scores are available in the descriptive statistics section.

Given that both native speakers and non-native speakers assessed the utterances including the phonological processes similarly in the sense of ratings (with lateralization being rated the lowest by both groups, and addition of /n/ being rated highest by both groups) it can be posited that lateralization has the highest impact on comprehensibility, addition of /n/ has the lowest, and so on. This is most likely due to the fact that lateralization within a word occurs regardless of context, whereas the process of addition of /n/ does not necessarily have to occur if the words are

uttered separately and clearly. For example, the lateralization tokens *originally* (원래) and *contact* (연락) should always undergo the process, whereas addition of /n/ tokens such as *trip to Korea* (한국 여행) or *something that can't be forgotten* (못 잊을 것) do not necessarily undergo the process when each syllable is spoken individually. For that reason, it seems that both native and non-native speakers were not nearly as affected by the addition of /n/ process as they were by the others. Given this fact alone, a clear pedagogical implication of the results is that should Korean instructors find themselves unable to teach all of the common phonological processes in their Korean class they should direct class time towards practice on lateralization, nasalization, and palatalization.

The type of phonological process clearly had an effect on the comprehensibility of speech samples, but only for the native speaker group. The non-native speaker group did not show any overall significant difference in ratings in terms of the process factor of the utterance. This coupled with the fact that their ratings were on average higher than the native group suggest that non-native raters are less sensitive to phonological processes. Having an understanding of this is pedagogically significant because if non-native speakers at an advanced level are not as sensitive to phonological processes that native speakers are sensitive to, then there is the potential for learners who are not explicitly taught about the processes to never learn said processes and never gain a linguistic awareness of them. Over time, these pronunciation issues could potentially fossilize into errors that learners cannot repair since even at advanced levels they may not be sensitive to them. This is of particular importance in the context in question: universities in the United States. This particular population of students does not have the benefit of native Korean speakers being easy to find and practice with, nor can they go out into the world and practice Korean in their daily lives. Much of their practice will come from working with their peers, and

the limited number of native speakers available in their area, which may only be their instructors. Given that their peers will likely not be sensitive to the phonological processes either, it becomes essential for the instructor to raise their awareness of the processes.

The Role of Context

For both rater groups context played a part in the comprehensibility ratings. For all processes except for addition of /n/, ratings of speech samples in context were significantly higher for native speakers. For the non-native group, ratings were also higher, though the differences in ratings were not as great as those for the native speakers. This further reveals the potential error gravity of the phonological processes, given that without context, ratings were significantly lower. However, it is important to note that none of the mean rating scores ever reached above 8 (with 9 being the highest possible score) which suggests that while having the speech sample in context helped raters to understand the utterance, the students' incorrect pronunciation still impacted the ratings negatively. In other words, were the students to have been pronouncing the tokens correctly we could expect high comprehensibility ratings, but that was not the case. This suggests students could benefit from pronunciation instruction.

Native Speakers versus Non-Native Speakers

The trend from data collected from these two groups of raters suggests that native speakers of Korean are more impacted by mispronunciations of phonological processes in Korean than are non-native advanced Korean speakers. This is evidenced by the overall ratings

of non-native speakers being consistently higher than those of native speakers. However, the main difference between these two rater groups was apparent in the level of context. On the whole, native speakers rated utterances in isolation far lower than those in-context. In contrast, non-native speakers rated utterances in isolation and in-context similarly, as shown by the clustered means of assigned ratings and lack of significance for the main effect of context. Furthermore, native speakers' comprehensibility ratings were affected by context and process significantly for four of the processes (lateralization, nasalization, palatalization, and fortis articulation) whereas non-native speakers only had significant effects for two of the processes (lateralization and palatalization). Still, even in the case of these processes non-native speakers rated them as more comprehensible than did the native speakers.

Pedagogical Implications

At its core, the purpose of this study is to contribute to the field of Korean applied linguistics by offering Korean as a foreign language instructors some insight into the pronunciation acquisition of their students in the United States university context and to help inform their teaching. The results of this study are such that we can suggest Korean instructors devote class time to at least four of the six phonological processes explored in this study: lateralization palatalization, nasalization, and fortis articulation, with lateralization taking the prize as the most impactful phonological process. Given that this study went straight to the perception of the listener to determine the potential error gravity of the processes, Korean instructors can confidently raise their student's awareness of these processes regardless of a student's first language. Since raters effectively told us what processes impede their ability to

comprehend an utterance, students should be made aware of these processes and how to pronounce words including them regardless of their first language. Additionally, instructors should create opportunities for their students to experience and produce these phonological processes in-context, as context has been shown to play as much a role as process. Ideally, instructors could use authentic materials that students are familiar with, such as Korean dramas or music, to point out how these processes are manifested in speech.

It is of particular importance that instructors raise awareness of phonological processes in their students in the context of universities in the United States because, unlike students studying in Korea, the students in the United States do not have a constant input of Korean that could aid in their natural acquisition of the processes. Being outside of Korea also poses the question of who the Korean language students' interlocutors are. Of course, some programs are lucky enough to have native Korean speaking volunteers to work with students, but the possibility that many students will look to their peers in higher level Korean courses who are not native speakers cannot be ignored. Results indicate that advanced non-native speakers' assessments of comprehensibility are not nearly as affected by process as native speakers are, so it is entirely plausible that Korean language students would not receive the necessary feedback from their advanced peers to improve their own pronunciation. This is not the fault of these students, but it exemplifies the fact that instructors need to take initiative to make students at least aware of these phonological processes.

Limitations

A clear limitation of this study is the small sample size of only 10 students, although this is often unavoidable when researching a less commonly taught language and was necessary

given the large number of audio files that raters had to evaluate. In addition to that, while the entire purpose of using the DictoSpeak activity was to avoid read speech as much as possible, when editing the files it appeared that about three of the students referred to their keyword list and read the keywords while forming sentences more than other students who mainly had a conversation with the interlocutor. Since the discourse was only audio recorded it is hard to determine the exact ratio of read to spontaneous speech, but it is nevertheless important to note as a potential limitation. It is possible that fully spontaneous speech would yield different results. Additionally, while the passage was designed with the students' Korean ability in mind, it became clear from reports from the interlocutor and discussions with the students upon completion of the activity that some parts of the passage were hard for them to understand that were not anticipated. For example, many students struggled with the word 취직, which means employment. This was surprising as it is a common word that is taught in lower level courses. As such, some students needed to spend time asking the Korean interlocutor for meanings of words they did not know, or for clarification when it was anticipated they would be able to understand the passage.

Suggestions for Future Research

Future studies could focus on the four phonological processes found to have the greatest impact on comprehensibility. Given that this study used samples taken from discourse, future studies could explore the phonological processes in a more controlled environment. It could be beneficial to have students read a large number of sentences that include phonological processes regardless of whether or not they know the meaning. Such studies could explore the nature of the

errors, as well as to what extent familiarity with a word impacts pronunciation using a vocabulary knowledge questionnaire to explore the relationship between word familiarity and acquisition of implicit phonological process knowledge. In the same vein, future studies could be conducted on pronunciation instruction of these processes, and following that instruction, students' ability to accurately produce tokens of the processes and identify processes when they hear them in speech.

APPENDICES

APPENDIX A – DictoSpeak Passage

DictoSpeak (Dictogloss) Passage

- Nasalization
- Lateralization
- Aspirated consonants
- Fortis articulation
- Palatalization
- Addition of [n] across word boundaries

주제: 한국여행

승리 씨가 서울을 떠나 미국에 돌아온 지 벌써 7 년이 지났어요. 서울에 살았을 때는 유학생이었어요. 유학 생활이 끝나고 미국으로 돌아와서 바로 취직했어요. 원래 한국에 돌아갈 생각이 없었지만 어느 날 승리 씨가 회사에서 한국으로 해외 출장을 보냈어요. 드디어 한국에 갈 날이 왔어요. 승리 씨는 "와! 다시 한국에 다시 갈 수 있게 됐네" 라고 외치면서 한국에 있는 친구들에게 연락했어요. 3 일 동안 서울에 있을 거라서 친구하고 같이 놀 수 있을 거라고 생각했어요. 한국에 살았을 때 친구하고 같이 놀러 갔던 곳에 다시 가고 싶어요.

승리 씨가 한국에 도착했어요. 공항에서 호텔까지 지하철로 갈 수 있었어요. 한국의 교통이 얼마나 편리한지 잊어버리고 있었어요. 첫 날에는 너무 피곤해서 그냥 호텔에서 잤어요. 두 번째 날에는 회사 일 때문에 바빴어요. 세 번째 날에는 지하철 2 호선 문래역 근처에서 점심 약속이 있었어요. 드디어 오랫동안 보고 싶었던 친구들을 만날 수 있었어요. 언어 교환을 같이 했던 동현 씨도 만났어요. 7 년 전에는 동현 씨도 대학생이었는데 요즘은 회사에서 일해요. 승리 씨가 이런 동현 씨를 보고 '얘가 정말 씩씩한 어른이 다 된 것 같네'라고 생각했어요. 둘이 같이 즐겁게 이야기를 하면서 좋은

시간을 보냈어요. 그날 같이 서울역사박물관에도 갔고 같이 점심도 먹었어요. 음료수는 항상 술 이라서 음료수로 술을 시켰어요. 점심을 먹은 후에 술을 더 마시러 술집에 가서 문이 닫힐 때까지 놀았어요. 호텔로 돌아가는 길에 술을 많이 마셔서 지하철 2 호선 문래역을 못 찾았어요. 그래서 둘이서 같이 길을 걷다가 술이 깨서 문래역을 다시 찾았어요.

그런데 호텔에 도착했을 때 큰일이 생겼어요. 승리 씨는 호텔을 3 박 4 일로 예약한 줄 알았는데, 호텔에 도착했을 때 2 박 3 일로 예약한 것을 알게 됐어요. 그 날 밤에 잘 방이 없어서 다른 호텔을 찾아야 할 줄 알았는데, 다행히 동현 씨가 승리 씨를 자기 집으로 초대했어요. 그래서 승리 씨는 한국여행의 마지막 밤을 친구 집에서 잤어요.

네 번째 날 승리 씨가 미국으로 돌아왔어요. 동현 씨가 내년에 미국 여행을 올 거라고 해서 둘이 1 년 뒤에 다시 만나기로 했어요. 미국으로 돌아오는 비행기에서 재미있는 한국여행을 못 잊을 것 같다고 생각했어요.

APPENDIX B – Keyword List

Korean DictoSpeak Activity

Directions: Using the keywords below and your memory of the passage, discuss what you read with the native speaker. Recall and discuss as much as possible. For your convenience, key terms are given below to jog your memory, and they are listed in the order they appeared in the passage. Difficult terms are provided with definitions. You may ask the speaker for definitions of any of the words you are unfamiliar with.

- 7 년
- 유학 생활이 끝났다
- 취직했다
- 원래 한국에 돌아갈 생각이 없었다
- 해외 출장 – overseas business trip
- 한국에 갈 날이
- 한국에 있는 친구들에게 연락했다
- 3 일 동안
- 친구하고 같이 놀 수 있을 거라고 생각했다
- 친구하고 같이 놀러 갔던 곳
- 한국에 도착했다
- 지하철로 호텔까지 갈 수 있었다
- 교통이 얼마나 편리한지
- 첫 날에는 피곤해서
- 지하철 이호선 문래역
- 약속이 있었다
- 오랫동안 보고 싶었던 친구, 언어 교환 같이 했던 친구
- 씩씩한 어른
- 같이 이야기했다… 같이 서울역사박물관(Seoul Museum of History)에 갔다… 같이 점심 먹었다
- 음료수
- 술집이 문이 닫힐 때까지
- 술을 많이 마셨다
- 지하철 이호선 문래역
- 큰일이 생겼다
- 예약한 줄 알았는데…
- 잘 방이 없었다
- 다른 호텔을 찾아야 할 줄 알았는데…
- 한국 여행의 마지막 밤
- 친구가 내년 미국 여행 올 거라고
- 1 년 뒤에 다시 만나다
- 재미있는 한국 여행을 못 잊을 것 같다

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