

EXPLORING THE CONNECTEDNESS OF THE ASPECTS OF THAI KFL LEARNERS' PHONOLOGICAL AWARENESS, ORTHOGRAPHIC AWARENESS, AND PRONUNCIATION PRODUCTION

Chun-Ye Kim

School of Liberal Arts, Mae Fah Luang University, Thailand

ABSTRACT

Corresponding author:

Chun-Ye Kim
chunye.kim@mfu.ac.th

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This study aimed to explore how the aspects of Thai KFL (Korean as a foreign language) learners' (beginner-level, 79 persons) Phonological Awareness (PA), Orthographic Awareness (OA), and Pronunciation Production (PP) are connected in terms of L1 interference. To investigate the aspects of these three realms, PA and OA tasks, which were modified from the previous study, were implemented for the learners, and the data on PP was collected from oral tests. The format of PA and OA tasks was developed in three domains for each: PA items were divided into initial phonemes, final phonemes, and vowel phonemes, while OA items were classified into initial consonants, final consonants, and vowels. Through the results of PA and OA tasks, ㅈ and ㅊ, and ㅂ and ㅍ were derived as the most challenging initial phonemes/letters for Thai learners. ㅌ and ㄴ were also seen as challenging final phonemes/letters. However, new error types were also found in transferring ㄴ into ㅌ, which is the reverse of the previous studies done (ㅌ was transferred into ㄴ). Diphthongs such as ㅕ, ㅘ, ㅕ, and ㅑ have emerged as the most challenging vowels. The aspects of PA and OA were closely reflected in PP, and in turn, the aspects of PP are reflections of the underlying abilities of PA and OA. Therefore, to enhance learners' pronunciation production, Korean language educators should note that the above-mentioned phonemes and letters are difficult for Thai learners and they need to provide explicit instructional strategies for the corresponding items.

Keywords: Connectedness; phonological awareness (PA); orthographic awareness (OA); pronunciation production (PP); L1 interference

1. INTRODUCTION

The significance of pronunciation instruction in foreign language teaching has shifted quite drastically in terms of positionality. In the Audio-Lingualism era of the 1970s, native speaker level of pronunciation was

intently pursued. However, in the Communicative Language Teaching era (the 1980s and 1990s) comprehensible pronunciation was deemed as more acceptable compared to previous decades (Kim, 2022). We might not set high expectations on the quality of pronunciation that reaches the authentic level of the target language. However, accurate and clear pronunciation is still one of the important factors that could make L2 learners' language performance evaluated positively. If learners' pronunciation is not accurate, the meaning may not be conveyed clearly, which can hinder smooth and efficient communication.

Learners' pronunciation errors indicate that they have not properly recognized the phonetic values of certain consonants and vowels, which are the smallest units of the target language. For example, if an ESL/EFL learner cannot properly pronounce *r* and *l* in a target language, it may be assumed that the learner has not properly mastered the phonetic values of *r* and *l*. From this point of view, it is important to accurately recognize each phoneme and letter from the beginner level of foreign language classes. Particularly, for beginner learners, the ability to hear sounds and distinguish them accurately, and the ability to precisely remember and apply correct spelling matter.

Within the learner's pronunciation production (PP), there is the underlying ability of the language otherwise known as Meta-Linguistic Awareness (MLA). MLA indicates the ability to reflect upon and manipulate the structural features of spoken language, treating language itself as an object of thought (Tunmer & Herriman, 1984, p. 12). MLA can be classified into several realms such as phonological awareness (PA), orthographic awareness (OA), morphological awareness (MA), lexical awareness, syntax, semantics, pragmatics, and so forth. Focused on beginner-level learners' internal cognitive ability, PA and OA are more influential than any other realms of MLA, due to the fact that beginner learners have not fully developed comprehensive MLA yet. PA is defined as the ability to identify and manipulate speech phonemes in spoken languages (Yeon, 2012). OA is defined as the ability to distinguish the letters and recognize acceptable and unacceptable letter patterns and sequences in written words (Treiman & Cassar, 1997). PA and OA in a target language (L2) have been reported to be prominent predictors of L2 learners' language performance in various ways. Therefore, when learners try to learn foreign languages, the ability to adeptly distinguish sounds and letters is one of the most significant skills because learners' language performance is influenced by their underlying PA and OA. Therefore, it is premised that if PA and OA for a specific language are firmly established, these features will be reflected in pronunciation production as well.

This study aims to explore the aspects of beginner-level Thai KFL (Korean as a foreign language) learners' PA and OA through the tasks in order to identify the challenging phonemes and letters for Thai learners. The results will investigate how PA and OA relate to PP in terms of L1 (learners' mother tongue, Thai language) interference. First, through the analysis of the results of PA, the challenging phonemes that Korean educators should note and emphasize for Thai KFL learners will be derived. Second, through the analysis of the results of OA, the most frequent and common error types will be derived. This result may imply that when Korean educators of basic Korean courses introduce phonemes and letters to Thai KFL learners, some items should be taught with more attention and emphasis than others. Finally, this study strives to reveal how PA and OA are connected to pronunciation production in the Korean language. Three research questions were set.

- 1) What are the aspects of Thai KFL learners' PA in the Korean language in terms of L1 interference?
- 2) What are the aspects of Thai KFL learners' OA in the Korean language in terms of L1 interference?
- 3) How are the aspects of Thai KFL learners' PP connected with the aspects of PA and OA?

The features of sound and letter systems of the Korean and Thai languages are depicted below to explore the aspects of Thai learners' PA and OA in terms of L1 interference.

The Korean language has 14 single consonants (ㄱ, ㄴ, ㄷ, ㄹ, ㅁ, ㅂ, ㅅ, ㅈ, ㅋ, ㅌ, ㅍ, ㅎ) and 5 double consonants (ㄲ, ㄸ, ㅃ, ㅆ, ㅉ). Consonants are divided into 5 categories such as bilabial, alveolar, alveolar-palatal, velar, and glottal depending on the articulation location. They are also divided into 5 categories: stop plosive, fricative, affricative, nasal, and fluid, depending on the manner of articulation (Ha et al., 2009). In Korean phonology, there is a three-way contrast (lax-tense-aspirated) in stop plosive (ㅂ-ㅃ-ㅍ, ㄷ-ㄸ-ㅌ, ㄱ-ㄱ-ㅋ) and alveolar-palatal affricates (ㅅ-ㅆ-ㅊ), whereas a two-way contrast (lax-tense) in the alveolar fricatives (ㅅ-ㅆ), and no contrast for the glottal fricative (ㅎ) (Sohn, 1999). It has been reported that amongst a three-way contrast (lax-tense-aspirate), the lax/lenis is the trickiest for KFL learners. Korean vowels, 21 in total, can be divided into 10 monophthongs (ㅏ, ㅓ, ㅗ, ㅓ, ㅡ, ㅣ, ㅐ, ㅔ, ㅚ, ㅟ) and 11 diphthongs (ㅑ, ㅕ, ㅛ, ㅕ, ㅛ, ㅕ, ㅕ, ㅕ, ㅕ, ㅕ, ㅕ). Vowels are classified into high vowels (ㅏ, ㅓ, ㅗ, ㅓ, ㅡ, ㅣ), medium vowels (ㅐ, ㅔ, ㅚ, ㅟ, ㅕ), and low vowels (ㅑ, ㅕ) depending on the height of the tongue during the articulating. In addition, it is classified into flat-lip vowels (ㅏ, ㅓ, ㅗ, ㅓ, ㅡ, ㅣ) and rounded-lip vowels (ㅟ, ㅚ, ㅕ, ㅕ) depending on the shape of the lips during the articulating (Kim & Lee, 2015).

The Thai language has 44 consonants, which are divided by consonant clusters as high, middle, and low consonants in orthography. Amongst 44 consonants, two consonants are not used anymore. Therefore,

currently, 42 consonants are in use in orthography. However, in phonology, Thai has 21 phonetic values because some consonants of the Thai language have the same phonemes (Yoon, 2010). In the Thai language, there are 32 vowels composed of 18 monophthongs (9 long vowels and 9 short vowels). Additionally, there are 6 diphthongs (3 long vowels and 3 short vowels) and 8 special vowels (Yoon, 2010, p. 211). Compared to the Korean language, the number of diphthongs in Thai is quite small. This is one of the reasons that Thai KFL learners have difficulty pronouncing Korean diphthongs such as / ㅌ, ㅋ, ㅍ, ㅠ / (Won, 2011, p. 301).

2. LITERATURE REVIEW

Previous research was reviewed on L1 interference, contrastive analysis, and Thai KFL learners' error aspects that emerged in Korean language performance.

2.1 L1 Interference and contrastive analysis

Language transfer is the effect of one language, particularly the first language, on another. It can occur at all levels: pronunciation, vocabulary, grammar, and discourse. Language transfer takes place in both positive and negative ways. Moreover, amongst the two ways, when negative language transfer largely occurs, it is called interference (Thornbury & Slade, 2006).

L1 interference refers to the influence of native language structures on students' performance and development in the target language (Hashim, 1999; Bennui, 2016). Urid Weinreich first introduced this term as the negative influence of one language on another in a bilingual context in 1953 (Alamin & Ahmed, 2012). It is common that when L2 learners perform in the target language, some of their L1 features appear in their language production. Wilkins (1972) argues that if the structures of the two languages are the same, no difficulty is anticipated, and that teaching is not necessary. Additionally, simple exposure to the language would be enough for the learners to acquire a new language. In contrast, if the structures of the two languages are distinctively different, then one could expect a relatively high frequency of errors to occur in the target language (Dechert, 1983; Ellis, 1997). However, since it is nearly impossible to find the same structure of languages in this world, many researchers have been interested in further exploring L1 interference. According to James (2013, p. 4), around 30 percent of the errors are attributed to learners' false transference of L1 language systems to the target language. Other research revealed that approximately one-third of the deviant sentences could be attributed to L1 (George, 1971; Brudhiprabha, 1972).

However, in the late 1980s, researchers took an interest in learners' errors as they found that the learners' L1 was not the only linguistic factor affecting the acquisition of the L2 or L3 of a target language. The learners' failure to master the target language comprehensively could be attributed to target language interference. This was associated with the general learning strategies (Griffiths & Parr, 2001) such as overgeneralization, ignorance of the rules of restriction, incomplete application of errors, and false concepts hypothesized (Corder, 1971). Richards (2014) also argues that between 3–25% of all errors are because of L1 interference and 75 percent of errors are "non-contrastive", which means they do not relate to L1 interference.

Based on the previous findings, James (1993) classifies interference into 2 types of subcategories: interlingual interference and intralingual interference. Interlingual interference is L1 interference caused by the learners' L1, as learners tend to transfer L1 knowledge into the target language one-on-one. Intralingual interference means that the target language itself naturally causes errors. When the learners apply learning and communication strategies, errors happen in the form of analogy, grammatical errors, redundancy, overcorrection, and overgeneralization.

The theory of interference led to contrastive analysis, which became the primary model in the 1960s (Alamin & Ahmed, 2012). Contrastive analysis attempted to investigate what is difficult or easy for L2 learners by identifying differences and similarities between L1 and L2 in phonology, morphology, syntax and so forth (Yoon, 2010). Contrastive analysis involved identifying similar features of the L1 and comparing the forms and meanings between the two languages to find similarities and differences. Contrastive analysis is commonly used for predicting L2 language learners' errors in the contrastive framework. For instance, sounds found in the target language (L2) (e.g., ㅋ in Korean) that do not exist in the first language (L1) (e.g., Thai) are considered difficult for the learner to produce and may result in errors in L2 target language. The contrastive analysis hypothesis claims that all the errors made in learning L2 could be attributed to L1 interference. However, it was found that many errors predicted by contrastive analysis did not emerge in L2. Even more surprisingly, some common errors that were made by L2 learners were irrelevant to their L1. Therefore, that contrastive analysis could not predict all learning obstacles or error types that could occur for language learners. However, it was still useful to explain the errors retrospectively. In summary, interference analysis tends to work from the abnormal sentence back to the L1(mother tongue) whereas contrastive analysis does the other way, predicting errors by comparing the linguistic systems of L1 and the target languages (Richards, 2014, p. 5).

2.2 Thai KFL learners' challenging phonemes/letters in the Korean language

2.2.1 Challenging Korean consonants for Thai learners

The common errors related to the consonants from Thai KFL learners were reviewed first. Sattathamkul (2008, p. 35) points out that syllable initial consonants, especially lenis/lax and aspirated consonants were challenging. Thai learners have difficulty telling the lenis/lax and aspirated apart (e.g., ㄱ-ㅋ ㅈ-ㅊ, ㄷ-ㅌ, ㅂ-ㅍ, ㅈ-ㅊ). In Sattathamkul (2008), /ㄱ/, /ㅅ/ and /ㅈ/ were drawn as the trickiest consonants for Thai to pronounce. Yoon (2010) also addressed the challenging phonemes for Thai learners were lenis/lax such as /ㅂ/, /ㄷ/, /ㄱ/, /ㅅ/ because Thai language has fortis and aspirated sounds but lacks lenis/lax sounds in its phonetic system. Supsin (2012) found that Thai learners tend to pronounce lenis/lax as aspirated, for instance, ㄷ-ㅌ, ㅈ-ㅊ, ㄱ-ㅋ. Park (2014) investigated patterns of learners' pronunciation errors and L1 interference through reading experiments. The pronunciation of /ㄱ/, /ㅅ/, /ㅈ/, /ㅊ/ in syllable initial consonant and syllable-final consonant of /ㅌ/ held the highest error ratio. Although the error ratios slightly decreased as the learning period increased, the reduction was not significant. Katawee (2014) contends that KFL learners should recognize allophones in the Korean language. For instance, ㅂ in Korean when it is placed in the syllable initial consonant, is pronounced as a voiceless sound /Pʰ/ whereas it is pronounced as a voiced sound /b/, when it is placed in the middle of the syllable. For example, Korean native speakers may not recognize the differences in these two sounds because they see the same letters in the orthography of 부부 (couple). The word of 부부 has combinations of different sounds like /Pʰubu/, and KFL learners are more likely to notice the differences in these sounds than native speakers. Kim (2014) reveals that Thai KFL learners have a prominent pronunciation error in that they pronounce syllable-final consonant /ㅌ/ as /ㄴ/. This is one of the strongest indicators that Thai learners have been considerably influenced by L1 interference. In the Thai consonant system, r (ຣ) and l (ລ, ວ) are allowed in initial and final consonants in orthography, but they are not accepted as the final phonemes. Therefore, Thai learners make errors in pronouncing /ㅌ/ as /ㄴ/ since they apply L1 phonological rule to the Korean language.

2.2.2 Challenging Korean vowels for Thai learners

Yoon (2010) points out that the Thai vowel system is quite similar to the Korean language in that there are 32 vowels including 18 monophthongs (9 long vowels and 9 short vowels) and 6 diphthongs (3 long vowels and 3 short vowels) and 8 special vowels. For Thai students, acquiring the Korean vowel system is not very difficult. Especially the acquisition of monophthongs in both languages is almost the same, making it easier for students to understand. However, some Korean diphthongs are difficult for them to pronounce. Ru (2011) examined vowel pronunciation errors by using L1 native speakers' assessment. The result revealed some typical types of pronunciation errors: /ㅐ/ was replaced with /ㅔ/, /ㅔ/ was replaced with /ㅐ/ and /ㅓ/ was replaced with /ㅓ/, more errors were found in diphthong vowels. Supsin (2012) found that Thai KFL learners failed to tell some vowels apart: /ㅐ/ and /ㅔ/, /ㅚ/ and /ㅓ/, and /ㅔ/, ㅚ, ㅟ/. However, as for these vowels, it should be noted that even for native speakers it is hard to tell them apart if only one syllable is pronounced. Therefore, these vowels should be understood in the context of the language, not just based on the phonetic sounds (Kim, 2013).

Most of the previous studies have focused on challenging consonants and vowels from the outcome of learners' pronunciation production. However, this study will try to derive the challenging phonemes and letters through explicit PA and OA tasks. The results will be investigated in terms of L1 interference and whether they will be reflected in learners' PP or not.

3. METHODOLOGY

The methodology depicted participants' information, PA and OA tasks, and the assessment of PP as research tools.

3.1 Participants

To investigate the aspects of PA and OA, 79 learners (male: 7, female: 72) were recruited from Korean 1(K1) and Korean Conversation 1(KC1) courses at Mae Fah Luang University. Most of the learners were 3rd year (45 persons) and 4th year (30 persons) students from diverse majors since K1 and KC1 were elective courses that were available to all students. Participants from the Korean 1 course had completed 45 hours of learning Korean, and participants from the Korean Conversation 1 course had completed 90 hours of learning time at Mae Fah Luang University. The EC (Ethics Committee) of Mae Fah Luang University approved the

present study on October 18, 2021. All the procedures were taken in line with the instructions of the ethics committee.

3.2 PA and OA Tasks

The tool to measure learners' Phonological Awareness and Orthographic Awareness was modified from Yeon (2012) since the format was most suitable for beginner-level learners. To examine the aspects of PA in terms of L1 interference, the quiz items of PA were composed of 3 domains: initial sounds, final sounds, and vowel sounds. 10 questions were allotted for each domain. The quiz items of OA were also composed of 3 domains: initial consonants, final consonants, and vowels. 10 questions were allotted for each domain of OA too. The reliability of the tasks was certified by the Cronbach α coefficient (PA: .825, OA: .820). As for the PA task items, the learners were directed to listen and choose the one initial/final/vowel sound that is phonologically different from the others. The same task items were applied to K1 and KC1 students. As for the OA task items, the learners were instructed to see the Korean word/sentence with English meaning and select the correct orthography in the respective domains. Different task items were applied to K1 and KC1 learners because they were developed based on their coursebooks¹.

The researcher implemented PA and OA tasks from November 22 to 24, 2021, by sharing Google Forms in an online class. The students were informed that task scores would not be included in their academic grades. The students were closely supervised throughout the tasks to ensure they did not refer to any supplementary material. The results of PA were examined based on the ratio of incorrect answers, and the results of OA tasks were sorted based on the frequency of error types. Descriptive statistics in Statistical Package for the Social Sciences (SPSS) were utilized when analyzing the results of PA and OA tasks.

3.3 Assessment of PP (Pronunciation Production)

The error data of PP was collected from the oral tests, which were developed based on the coursebook by the researcher. The oral tests were conducted during online classes from November 29, 2021 to December 1, 2021. The teacher showed questions on the PowerPoint slides and students were directed to understand the questions' meaning and then answer in Korean. The K1 learners were assigned to answer 5 questions for 5–6 minutes while the KC1 learners had to answer 8 questions for 8–10 minutes. Learners' performance was recorded in Google Meet and the recording file was shared with three native Korean language educators for collecting all the error types and frequencies.

4. RESULTS

The results of the PA task were re-arranged in descending order according to the ratio of incorrect answers of the combined group ($N = 79$) since the task items were the same. The results of the OA task were organized by the method of descending order by the frequency of error types. That is, all the incorrect answers were collected and re-arranged according to frequency.

4.1 The Results of PA Task

The mean score of three domains of PA for 79 participants emerged in these orders: final phoneme (7.58/10, SD: 2.010), initial phoneme (6.89/10, SD: 2.094), and vowel phoneme (6.82/10, SD: 1.838). The mean of total score of PA was 21.29/30 (SD: 4.737). The results indicate that it is easier to differentiate the final phonemes than the initial phonemes and vowel phonemes since the final phonemes merge into only seven phonemes. Table 1 demonstrates the three highest incorrect answers from PA task among initial, final, and vowel phonemes, respectively as below.

The initial phonemes that K1 and KC1 learners could not differentiate proficiently appeared in this order: /ㅈ & ㅊ/, /ㅋ & ㄱ/, and /ㅍ & ㅂ/. /ㅈ & ㅊ/ were the most difficult phonemes, showing 68.4% of incorrect answers. /ㅋ & ㄱ/ were the second most difficult phonemes, showing 64.6% of incorrect answers. The third was /ㅍ & ㅂ/, which showed 63.3% of incorrect answers. It has been widely acknowledged that /ㅈ & ㅊ/ are the most challenging initial phonemes for KFL learners to differentiate through several research (Sattathamkul, 2008; Supsin, 2012; Park, 2014). This fact was echoed again in the present study. The three items of /ㅈ & ㅊ/, /ㅋ & ㄱ/, and /ㅍ & ㅂ/ show that Thai learners have difficulty telling lenis/lax and aspirated in alveolar-palatal affricates and stop plosives. The initial phonemes that the learners could differentiate proficiently appeared in this order: /ㅅ & ㄱ/, /ㅅ & ㅊ/, and /ㅌ & ㅋ/. /ㅅ & ㄱ/ ranked the easiest initial phonemes to differentiate, which showed 27.8% of incorrect answers. Both /ㅅ & ㅊ/ and /ㅌ & ㅋ/ ranked second, which showed 31.6% of incorrect answers. The remarkable item, however, was /ㅅ & ㅊ/. Although /ㅅ & ㅊ/ have been considered one of the most difficult initial phonemes for KFL learners to differentiate, the current study showcased that

¹ *Sogang Korean 1A* was used for K1 course and *Get it Korean Speaking 1* for KC1.

detecting the difference between /ㅏ & ㅈ/ (31.6% of incorrect answers) is relatively easier than detecting the difference between /ㅊ & ㅈ/ (68.4% of incorrect answers).

The final phonemes that the learners could not differentiate proficiently appeared in this order: /ㅌ & ㄴ/, /ㄷ & ㄱ/, and /ㅂ & ㅅ/. /ㅌ & ㄴ/ were the most difficult final phonemes, showing 59.5% of incorrect answers. The difficulty of differentiation of /ㅌ & ㄴ/ for Thai KFL learners can be attributed to L1 interference, for Thai native speakers pronounce the final phoneme /l/ as /n/. /ㄷ & ㄱ/ were the second most difficult phonemes to distinguish, showing 54.4% of incorrect answers. The third was /ㅂ & ㅅ/, which showed 50.6% of incorrect answers. The final phonemes that the learners could differentiate proficiently appeared in this order: /ㅂ & ㅁ/ (16.5%), /ㅅ & ㄴ/ (16.5%), and /ㅏ & ㅂ/ (25.3%). Interestingly, in the case that the learners listened /ㄴ/ ahead of /ㅌ/ it is easier for them to distinguish the sounds correctly than in the case that /ㅌ/ is articulated ahead of /ㄴ/. The phenomenon that /ㅌ/ is replaced with /ㄴ/ among Thai learners emerged as a strong interference to distinguishing Korean sounds of /ㅌ/ and /ㄴ/.

The vowel phonemes that the learners could not differentiate proficiently appeared in this order according to incorrect answer frequency: /ㅓ & ㅕ/ (69.6%), /ㅕ & ㅗ/ (58.2%), and /ㅏ & ㅓ/ (45.6%). This confirmed the previous results that the learners had difficulty in telling diphthongs and monophthongs apart. The vowel phonemes that the learners could differentiate proficiently appeared in this order according to incorrect answer frequency: /ㅓ & ㅕ/ (8.9%) /ㅓ & ㅓ/ (10.1%), and /ㅏ & ㅓ/ (13.9%). The remarkable item was /ㅓ/. It has been assumed that the vowel /ㅓ/ is one of the most difficult vowels for KFL learners to learn. However, the Thai participants in this study showed a satisfactory ability to tell /ㅓ/ from /ㅓ/ and /ㅓ/.

Table 1: Three highest incorrect answers from PA task

Item	Differentiation of	Percent of incorrect answers
Initial phoneme		
/찹, 잘, 창/	/ㅊ/& /ㅈ/	68.4
/倨, 줄, 군/	/ㅋ/& /ㄱ/	64.6
/펴, 뇌, 피/	/ㅠ/& /ㅂ/	63.3
Final phoneme		
/밀, 웬, 닌/	/ㅌ/& /ㄴ/	59.5
/년, 작, 칸/	/ㄷ/& /ㄱ/	54.4
/콥, 캔, 뜻/	/ㅂ/& /ㅅ/	50.6
Vowel phoneme		
/추, 둑, 휴/	/ㅓ/& ㅕ/	69.6
/ㅗ, 쇼, 도/	/ㅕ/& ㅗ/	58.2
/처, 더, 펴/	/ㅏ/& ㅓ/	45.6

Furthermore, the results of the correlation analysis between PA and the three domains of PA showed that the distinction of final phonemes was the most highly correlated to the total score of PA. To improve the learners' PA in the Korean language, final phonemes should be highlighted more than other phonemes since in the Korean language, the final phonemes are comparatively more developed than in other languages (Kim, 2013, pp. 32–33).

4.2 The results of OA task

The mean scores of OA in each domain appeared in these orders: initial consonant (8.27/10, SD: 1.567), final consonant (8.11/10, SD: 1.941), and vowel (7.04/10, SD: 1.971). The mean of the total score of OA was 23.42 out of 30 (SD: 4.325). The most challenging letter in the OA task was the vowel for beginner KFL learners. When it comes to consonants, it revealed that the mean OA of final consonants was slightly lower than initial consonants, as the OA of final consonants has various options of writing even though they are pronounced the same. All the errors from learners' OA tasks were collected to examine the OA aspects closely. Error types were investigated and analyzed through the frequency of every wrong answer. Table 2 demonstrates the three highest incorrect answers from OA task among initial and final consonants and vowels respectively as below.

The error types that contained the three highest error ratios in initial consonants were organized below. The result exhibited that 10 error types out of 13 error types were connected to ㅅ, ㅈ, and ㅊ from the initial consonants-related question items. Therefore, when Korean language educators teach the Korean

alphabet, they should emphasize how important it is to differentiate these three consonants. Other error types were derived as learners failed to differentiate ㅌ & ㅍ, ㅋ & ㅌ, and ㅋ & ㅌ.

The reasons for errors in the final consonant-related questions can be put into three categories. First, learners lack knowledge about orthography. Therefore, they failed to differentiate some letters due to the similarity of the letter shapes. Second, they feel final consonants are challenging because the pronunciation of final consonants merges into seven sounds in phonology even though they are different in orthography. Third, the errors could be ascribed to L1 interference. The most noteworthy final consonants for Thai learners appeared ㅌ and ㄴ. As mentioned in much research, Thai KFL learners tend to replace ㅌ with ㄴ, and the same error types were found in the present study. However, surprisingly, they do not only replace ㅌ with ㄴ but also apply this reversely. As the learners chose ㅌ instead of ㄴ in orthography the errors related to ㄴ emerged as the most frequent errors, which came up with 5 types out of 16 error types. Learners chose incorrect letters such as ㅇ, ㅌ, and ㆁ for ㄴ even though the shapes are quite different. It implies that the final consonant ㄴ should be taught with special attention so that learners may recognize ㄴ clearly.

In the vowel-related questions, most of the errors happened because the learners replaced the diphthongs with monophthongs and changed the monophthongs into the diphthongs. In the cases where an error frequency is more than 30%, the learners failed to differentiate between ㅐ & ㅔ, ㅓ & ㅏ, ㅚ & ㅟ. In this study, the most challenging diphthongs for Thai KFL learners emerged as ㅚ. Comparatively less errors were found in differentiating ㅓ & ㅗ, ㅓ & ㅏ, ㅓ & ㅓ, ㅓ & ㅓ.

Table 2: Three highest incorrect answers from OA task

	Error types	Replace A with B	Percent (%) of error frequency
Initial consonants			
	(바지 → 파지)	ㅂ → ㅍ	30.0
	(자전거 → 사전거)	ㅈ → ㅅ	26.0
	(청소 → 정소)	ㅊ → ㅈ	23.0
Final consonants			
	(반갑습니다 → 방갑습니다)	ㄴ → ㅇ	28.0
	(몇 → 몇)	ㅊ → ㅈ	25.0
	(많아요 → 만아요)	ㅌ → ㄴ	25.0
Vowels			
	(시계 → 시게)	ㅟ → ㅔ	45.0
	(일본 → 일본)	ㅓ → ㅏ	33.0
	(래몬차 → 래몬차)	ㅚ → ㅐ	33.0

Furthermore, the results of the correlation analysis between OA and the three domains of OA showed that the distinction of the vowels was the most highly correlated to the total score of OA. Therefore, to improve the OA in the Korean language, the orthography of vowels should be highlighted more than other letters.

4.3 The results of PP

The error types of PP from K1 and KC1 were combined to investigate the general pronunciation aspects of the beginner group. The errors that occurred more than 3 times were included in the data analysis. In general, substitution errors were the most predominant when learners pronounced initial phonemes and vowel phonemes, while the three types of errors (substitution, addition, and omission) were all dispersed in the final phonemes. The frequencies of each error type related to the final phoneme are shown in this order: substitution (106 times), addition (46 times), and omission (14 times).

When the total error frequencies from each domain of PA were examined, the error frequencies of the initial phoneme were the highest (171 times). The second was the final phonemes (166 times), and the third was the vowel phonemes (59 times). It is apparent that the pronunciation of the initial phonemes and final phonemes is more challenging than that of vowel phonemes for Thai learners.

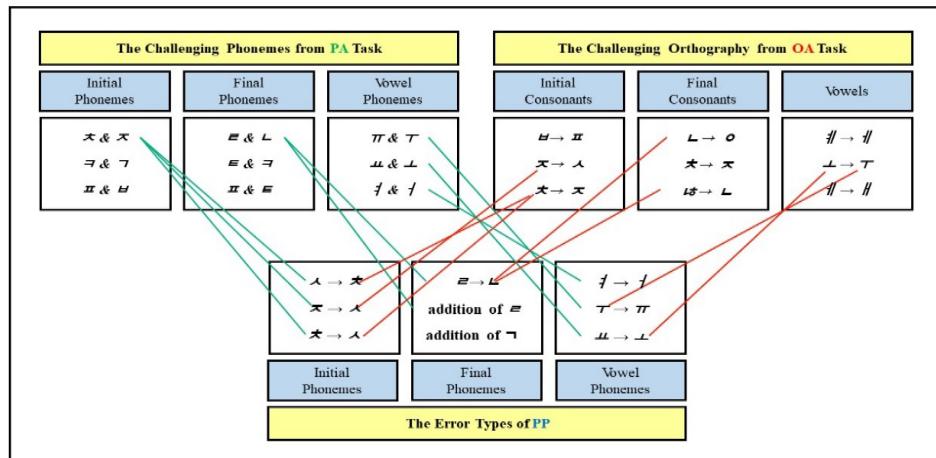
The result indicated that the predominant number of errors in the pronunciation of the initial phonemes were related to the pronunciation of /ㅅ, ㅈ, ㅊ/. It seems that the learners struggle with differentiating these 3 phonemes. Moreover, the most frequent error was that the learners pronounced /ㅅ/ as /ㅈ/. When looking at the final phonemes, the most prominent substitution error was to substitute /ㄴ/ for /ㅌ/. This is a common mistake for Thai learners to pronounce /ㅌ/ of the final phoneme as /ㄴ/, and it is mostly likely due to L1 interference. Regarding vowel pronunciation errors, the learners substituted diphthongs into monophthongs or vice versa. The three highest error types are organized in Table 3.

Table 3: Three highest error types from PP

	Item	Error type	Error frequency
Initial consonants			
	/ㅅ/ → /ㅈ/	substitution	36.0
	/ㅈ/ → /ㅅ/	substitution	25.0
	/ㅊ/ → /ㅅ/	substitution	20.0
Final consonants			
	/ㄹ/ → /ㄴ/	substitution	99.0
	/ㄹ/	addition	20.0
	/ㄱ/	addition	13.0
Vowels			
	/ㅓ/ → /ㅏ/	substitution	17.0
	/ㅜ/ → /ㅠ/	substitution	7.0
	/ㅡ/ → /ㅗ/	substitution	5.0

4.4 The connectedness of PA, OA, and PP

Figure 1 demonstrates how closely the PA, OA, and PP are connected. If learners do not have an adequate level of PA and OA in certain phonemes and orthography, these aspects are also reflected in their PP. The error aspects in PA and OA tasks were echoed in PP, which indicates that to improve PP, at the beginning of the course, PA and OA should be taught scientifically and systematically.

**Figure 1:** The connectedness of the aspects of PA, OA, and PP

5. CONCLUSION

The most challenging initial phonemes/initial consonants from PA and OA were ㅈ and ㅊ, and ㅌ and ㅍ. If these two pairs are placed on the initial part of the syllable it is hard for Thai learners to differentiate them phonologically and orthographically. As for the first pair of ㅈ and ㅊ, it is not something new as ㅈ, ㅊ, and ㅋ have been recognized as the most challenging initial phonemes/consonants for a long time through previous studies (Sattathamkul, 2008; Yoon, 2010; Supsin, 2012; Park, 2014). To help learners differentiate these 3 consonants, educators could use an articulation picture in the class, which enables learners to identify accurate places of articulation respectively. The pair of ㅌ and ㅍ, which emerged in this study, should be noted by Korean language educators in terms of the allophone of ㅍ (Katawee, 2014). In the initial phonemes of PP, /ㅊ, ㅈ/, and /ㅌ/-related errors are dominant. Some lax/lenis (e.g., ㅓ, ㅗ, ㅜ) were replaced with aspirated (ㅋ, ㅌ, ㅍ). It implies that Korean lax/lenis in initial consonants should be highlighted and introduced correctly because the Thai language has fortis and aspirated but does not have lenis/lax in the phonetic system. Some native Korean language teachers apply the visualization method by placing paper tissue before a mouth and asking learners to feel a different strength of aspiration for lenis/lax and aspirated. With this method, learners can feel a strong

sensation/movement when an aspirated sound is pronounced, while there is less sensation/movement when lenis/lax is pronounced.

The most challenging final phonemes/consonants from PA and OA were ㅌ & ㄴ. If these two pairs are placed on the final phonemes it is hard for Thai learners to differentiate between them in PA tasks. It has been reported that Thai KFL learners tend to replace /ㅌ/ with /ㄴ/, which is due to the L1 interference examined in Thai learners. Surprisingly, in OA tasks they also replaced ㄴ with ㅌ. Furthermore, ㄴ was derived as one of the most challenging final consonants in OA tasks. In the final phonemes of PP, most errors occurred when learners substituted the final phoneme /ㄴ/ for /ㅌ/.

The most challenging vowel phonemes/letters from PA and OA are diphthongs (e.g., /ㅠ, ㅛ, ㅕ/ in PA task and ㅕ in OA task). The learners have difficulty differentiating diphthongs and monophthongs in Korean vowels phonologically and orthographically. In PA and OA tasks, the learners replaced diphthongs with monophthongs. These aspects of PA and OA are directly reflected in PP. It seems that diphthongs emerged as hard items because of the significant difference in the number of diphthongs; Thai has 6 diphthongs while Korean has 11 diphthongs.

Based on the results of this study, Korean language educators should take note of specifically mentioned consonants and vowels when they first introduce the Korean alphabet system in a beginner course. In a further study, the specific teaching method could be discussed and proposed to overcome these challenging phonemes and letters in Korean language education.

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² The Roman transcriptions of Korean language in the references were done based on the Revised Romanization of Korean, which was declared by South Korea's Ministry of Culture, Sports and Tourism. (https://www.korean.go.kr/front_eng/roman/roman_01.do).

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