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The remarkable effect of Korean orthographic awareness on Thai KFL learners' pronunciation production*

Chun-Ye Kim**
(Mae Fah Luang University)

Kim, Chun-Ye. 2022. The remarkable effect of Korean orthographic awareness on Thai KFL learners' pronunciation production. *Linguistic Research* 39(Special Edition): 123-158. The purpose of this study is to examine the effects of beginner-level Thai KFL learners' (N=79) PA (Phonological Awareness) and OA (Orthographic Awareness) on their PP (Pronunciation Production) in terms of accuracy, fluency, and intonation. The format of PA and OA tasks was adapted from previous studies, and the task items were developed by the researcher in three domains: initial phonemes, final phonemes, and vowel phonemes for PA, and initial consonants, final consonants, and vowels for OA. The learners' PP was evaluated through the oral text of speaking tests in terms of accuracy, fluency, and intonation. The findings from multiple regression analyses demonstrate that the final phoneme awareness of PA and final consonant awareness of OA contributed significantly to the *accuracy and intonation* of PP. The final phoneme awareness and vowel phoneme awareness of PA and final consonant awareness of OA contributed significantly to the *fluency* of PP. This implies that, in the Korean language, final phonemes and final consonants are significant elements that educators and learners should pay the most attention to improve PP. The results of the regression analysis of six PA and OA variables on the total score of PP indicate that only final consonant awareness of OA contributed significantly to the model up to 31.0%. This study manifests that final consonant awareness of OA has a remarkable effect on learners' PP in the Korean language. Therefore, in order to improve learners' PP, Korean language educators should recognize the importance of OA and try to provide explicit instructional strategies to improve learners' OA. **(Mae Fah Luang University)**

Keywords PA (Phonological Awareness), OA (Orthographic Awareness), PP (Pronunciation Production), Thai KFL learners, Effects

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1. Introduction

MLA (Meta-Linguistic Awareness) refers to the ability to identify, analyze, and manipulate language forms (Koda 2007: 2). MLA can then be defined as "the ability to attend and reflect upon the properties of language" (Galambos and Hakuta 1988: 141), and this ability allows individuals "to step back from the comprehension or production of an utterance and to consider the linguistic form and structure underlying the meaning of the utterance" (Malakoff and Hakuta 1991: 147). It has been regarded as the underlying and fundamental process contributing to spelling and reading development (Yeon 2012). MLA can be categorized into three domains: PA (Phonological Awareness), OA (Orthographic Awareness), and MA (Morphological Awareness). Aside from these three domains, MLA also involves internal reflection on all levels of linguistic analysis: syntax, semantics, and pragmatics (Leivada et al. 2020). Looking into the three domains of MLA deeper, PA is considered to identify and manipulate speech phonemes (e.g., phonemes, onset, rhyme, and syllables) in oral languages (Yeon 2012). OA is referred to as the general understanding of the writing system of a particular language. It can be defined as the ability to recognize acceptable and unacceptable letter patterns and sequences in written words (Treiman and Cassar 1997). MA refers to the ability to reflect upon and manipulate morphemes (the smallest unit of meaning) and employ word formation rules in one's language (Kuo and Anderson 2006). In the current study, out of the three domains of MLA, MA was excluded, for MA was regarded beyond the learners' Korean proficiency level.

So far, much research has been done to investigate the role of MLA on the language performance of young native language (L1) learners in terms of reading and spelling. A few studies, however, have dealt with the contribution of MLA to the language performance of foreign language (L2) learners (e.g., Huynh 2011; Bassetti 2017). Fewer studies have been conducted on the effect of L2 learners' MLA on language performance in terms of speaking skills, compared to the amounts of studies relevant to reading and writing skills. As the researchers primarily investigated the native learners' language performance, there might be less of a need to examine the roles of MLA in speaking skills. However, there are several studies that have investigated the effect of MLA on speech production, a part of speaking skills (Damian and Bowers 2003; Roelofs 2006; Alario et al. 2007; Zhang and Damian 2012; Saletta et al. 2016; Bassetti 2017; Li and Wang 2017; Saletta 2019; Yoshihara et al. 2020; Dylman et al. 2022; Stoehr and Martin 2022). These studies

are insufficient to explain the effects of MLA on speaking skills since they haven't investigated speaking skills comprehensively. However, they are still valuable in the way that they might reflect MLA's potential contributions to speaking skills.

As the goal of foreign language learning has been recognized as developing communication skills, speaking skills have been highlighted as a trend in language learning. In this vein, among many other components of speaking skills, pronunciation is considered as one of the most significant factors of oral communication. As it was proven that MLA influences learners' language acquisition broadly, it might be assumed that MLA may also affect foreign language learners' PP (Pronunciation Production). Under this premise, the researcher attempted to investigate the empirical evidence on how the different domains of PA (initial phonemes, final phonemes, vowel phonemes) and OA (initial consonants, final consonants, vowels) in the Korean language affect the beginner level of Thai KFL (Korean as a Foreign Language) learners' PP. As strategies and tactics are needed to attain a particular goal, language teachers also need to be wiser in perceiving the invisible ability of learners. If PA and OA may be determined to have a specific effect on a particular group of learners' PP, then, more attention should be given to the particular domains of MLA. Also, more discussions can be carried out on how to improve MLA in the KFL field.

In order to look into the role of MLA in the Korean language, the characteristics of Korean need to be described. The Korean writing system is an alpha-syllabary called Hangul (Yoon and Brew 2006). Hangul is non-linear and composed of square blocks, in which letters are not presented in a line but are grouped into syllable blocks (Yeon 2012). In syllable blocks, the graphemes are arranged left to right and top to bottom. Because the Hangul syllable blocks are separated, Hangul has a clear syllable boundary (Kim 2009). An important feature in Korean is a phonological constraint on the final phoneme (coda): only seven phonemes (ㄱ, ㄴ, ㄷ, ㄹ, ㅁ, ㅂ, ㅇ) are allowed as the final phonemes, whereas 18 consonants (consonant ㅇ/ŋ/ is excluded) are allowed in the initial phoneme (onset). Another critical phonological characteristic in Korean is that in oral language, syllables are re-syllabified depending on the phonological environment. When a coda is followed by a vowel, a glide + a vowel, or /h/ + a vowel, without a pause, the final phoneme is carried over to the following syllable as its initial phoneme (Sohn 1999). In fact, a different set of particles (e.g., subject, object, and topic particles) is selected depending on whether the preceding syllable is a closed/consonant-ending syllable (VC or CVC) or an open syllable/vowel ending (V or CV). This selection of

different particles appears to augment re-syllabification into the CV syllable type (Kim 2007). The Korean language has a shallow orthography with transparent grapheme–phoneme (letter-sound) correspondences (Kim 2007). The extent of correspondence, however, differs depending on the components of the syllable. For instance, in the syllable initial consonants and vowels, grapheme-phoneme correspondences are highly consistent, whereas in syllable final consonants are less consistent. Because seven syllable-final phonemes are represented by multiple spellings (Sohn 1999). For instance, the final phoneme /t/ in syllable-final consonants is orthographically represented by six letters (i.e., ㅅ ,ㅆ, ㅈ ,ㅊ ,ㄷ, and ㅌ). Therefore, speaking of mastering the orthography of syllable-final consonants, KFL learners should pay more attention because of their multiple orthographic representations (Kim 2007). Moreover, in the position of syllable-final consonants, there are more complex alignments of the combination of single consonants (e.g., ㄶ, ㅙ, ㄺ, ㅛ, etc.), whereas 18 single and double consonants can be placed in the position of syllable-initial consonants.

The present research seeks to address the following questions: RQ 1) How do PA and OA affect Korean learners' PP in terms of accuracy depending on their Korean proficiency level (beginner and upper beginner)? RQ 2) How do PA and OA affect Korean learners' PP in terms of fluency depending on their Korean proficiency level (beginner and upper beginner)? RQ 3) How do PA and OA affect Korean learners' PP in terms of intonation depending on their Korean proficiency level (beginner and upper beginner)?

2. Literature review

The previous studies were examined in the vein of the effects of PA & OA and pronunciation instruction.

2.1 The effects of PA & OA

2.1.1 The effect of PA

PA has been explored for its perceived role in reading from 3 angles: awareness of different speech phonemes, capacity to store sound-based information, and quick retrieval

of information (Khan and Bajre 2018: 492). The significant effect of PA on reading were investigated by many studies (Ho and Bryant 1997; McBride-Chang et al. 2005; Cho et al. 2007; Park and Uno 2012; Nag and Perfetti 2014; Park and Uno 2015). Ho and Bryant (1997) found that PA at the age of two significantly predicted children's reading ability 2 and 3 years later. McBride-Chang et al. (2005) reported that PA was mainly related to word reading, vocabulary, and morphological awareness across all languages. Cho et al. (2007) showed findings that the correlation coefficients of all the PA tests with Korean Hangul regular word recognition among 4 and 5-year-old kindergartners in Korea were at or above .48. According to Park and Uno (2012), receptive vocabulary, phoneme awareness, and naming speed served as factors for predicting reading test scores of 3rd-grade children in Korea. Nag and Perfetti (2014) have shown that not only in alphabetic languages but also in some of the alpha syllabic languages, phonemic processing skills, that is, PA, were significantly correlated with reading. Park and Uno (2015) showed that phonological cognitive abilities have different degrees of influence on L1 learners' reading abilities. Phonological cognitive ability was a predictor for reading accuracy in elementary school's first and second grades, but not in higher grades. In addition, phonological cognitive ability was one of the primary cognitive abilities that predicted reading fluency in grades 1-3 of elementary school, but not in the fourth grade. This indicates that PA has a more significant influence on the learners of lower grades.

PA also tends to be highly correlated with spelling (Treiman 1993; Wade-Woolley and Siegel 1997; Landerl and Wimmer 2008). Treiman (1993) showed ample evidence that children's early spellings are dependent on their understanding of phoneme-grapheme correspondence and closely related to PA. Wade-Woolley and Siegel (1997) reported that phonological processing skills predicted L1 and L2 children's English spelling. Landerl and Wimmer (2008) also addressed that PA was the strongest predictor of spelling performance.

In addition, PA tasks utilized to measure PA in previous studies were investigated. Zirps (1990) used blending with stripping, blending without stripping, sound categorization task, sound counting task, and phoneme elision task to measure PA. Cho et al. (2007) measured PA by asking children to delete a sound, such as a phoneme onset, coda, and syllable levels, from a given word. Yeon (2012) used a phoneme detection task that was designed to detect children's ability to differentiate the phonemes in a spoken word. It consisted of an initial phoneme detection task and a final phoneme detection task. Park and Uno (2012) implemented the task of syllable deletion, onset deletion and

coda deletion, onset oddity, and coda oddity. Khan and Bajre (2018) applied syllable segmentation and spoonerism tasks, RAN Forward digit span to measure phonological processing skills. In the present study, unlike the previous studies which integrated three domains of PA (initial phonemes, final phonemes, vowel phonemes), a phoneme detection task was developed in 3 domains of PA respectively (10 items per each domain) to investigate each domain's effect.

2.1.2 The effect of OA

The initial research about OA predominantly came from alphabetic languages with substantial orthographic variations regarding shallowness/depth and regularity (Khan and Bajre 2018). A positive relationship between OA and word reading and spelling has been found across multiple L1 research studies (Yeon 2012: 23). The significant effects of OA on reading were investigated by several studies (Zirps 1990; Cunningham et al. 2001; Wang et al. 2006; Khan and Bajre 2018). Zirps (1990) administered phonological and orthographic tasks and reading tasks to 300 first-year elementary school students in North Florida. In the case of elementary school students, OA was a factor that had more influence on reading beyond PA. Cunningham et al. (2001) found that a composite measure of orthographic processing skills explained a substantial amount of unique variance in word recognition. Wang et al. (2006) found that Korean-English bilingual children's OA was positively related to word reading within the Korean language. Khan and Bajre (2018) found that the variance in reading fluency was significantly explained by phonological processing and orthographic knowledge. The variance in reading accuracy was significantly explained only by orthographic knowledge measured through a dictation task.

Previous studies have reported that OA played a pivotal role in learners' spelling performance (Zirps 1990; Walker and Hauerwas 2006; Sun-Alperin and Wang 2011). Zirps (1990) reported that OA was a factor that had more influence on spelling achievement beyond PA. Walker and Hauerwas (2006) found that OA best explained first and second graders' inflectional spelling performance. Sun-Alperin and Wang (2011) addressed that OA was a predictive factor of real-word spelling performance.

In addition, OA tasks utilized to measure OA in previous studies were investigated. Orthographic measures such as the letter-name knowledge task, letter-sound knowledge task, orthographic choice task, and homophone choice task were applied (Zirps 1990).

The orthographic choice task was designed to detect children's ability to identify the correct spellings among phonologically similar words. The homophone choice task asks children to select which of the two words is spelled correctly within a sentence. In this task, two real words that are phonologically similar were given, and children were asked to circle the word that fit the meaning of the sentence.

(1) Q: Which is a part of the body? (feet / feat)

Khan and Bajre (2018) applied Akshara identification, matra identification, and dictation tasks for orthographic knowledge. In the present study, unlike the previous studies which integrated three domains of OA (initial consonants, final consonants, vowels), the orthographic choice task was developed in 3 domains of OA respectively (10 items per each domain) to investigate each domain's effect.

2.2 Pronunciation instruction

2.2.1 The trend of pronunciation instruction

Pronunciation education has experienced a great fluctuation over the years. It was either extremely overrated or drastically underrated. Yoshida (2016) compared the trends of pronunciation education to a swinging pendulum. For example, during the audio-lingualism period, in the mid-20th century, pronunciation instruction achieved a pinnacle of significance, with the purpose of training learners to achieve native-speaker-level pronunciation. However, when audio-lingualism faded and the Communicative Language Teaching (CLT) period of the 1980s and 1990s emerged, pronunciation instruction suffered a steep decrease (Thomson 2017). During the CLT era, since the primary goal of learning foreign languages was set as the development of communication skills in target languages, there has been a tendency to pursue an understandable level of pronunciation rather than the native speakers' authentic pronunciation. Language teachers' expectations toward learners' pronunciation were greatly lowered because pronunciation was not considered a significant factor for proper communication. Over the CLT era, if learners' pronunciation is comprehensible and communication is possible, teachers have tolerated non-native accented speech. However,

without adequate pronunciation training, students may experience misunderstandings and even breakdowns in verbal communication, which may further adversely affect their self-confidence in language learning (Bai and Yuan 2019). In the early 2000s, there were some prominent issues and debates about pronunciation instruction, which included the intelligibility versus nativeness debate (Levis 2005; Ketabi and Saeb 2015), and the segmentals (i.e., consonants and vowels) versus suprasegmentals (i.e., stress, rhythm, and intonation) controversy (Ketabi and Saeb 2015). By the turn of the 21st century, neglect of pronunciation in foreign language teaching and research was addressed as an issue by applied linguists. At the same time, the transition of the trend of pronunciation instruction got initiated by the effort to move pronunciation back towards greater prominence (Derwing and Munro 2005; Levis 2005; Thomson 2017). In summary, pronunciation instruction was highlighted under the audio-lingualism, and faced a decline with the emergence of CLT. However, by the turn of the 21st century, it seems to be in the middle of recovering great prominence. Meanwhile, with the advancement of technology, pronunciation instruction has become more than 'just listening to what a teacher says and repeating it'. In the classroom-based setting, teachers evolve the instruction, so that learners may get access to a variety of pronunciation references and can even get feedback from the application. Pronunciation instruction is not limited to the classroom but expanded to many different spaces. However, in the field of language teaching, teachers, especially non-native L2 teachers, do not feel confident (Ketabi and Saeb 2015) when deciding on pronunciation foci, designing interactive pronunciation instruction, and providing individual pronunciation feedback.

2.2.2 The assessment of L2 learners' PP

Many language instructors find it difficult to assess L2 learners' PP in a fair and impartial manner. There have been numerous variances in viewpoints and techniques for evaluating pronunciation since a single consensus on pronunciation assessment has not been firmly established. Munro and Derwing (1995b) specified three aspects of pronunciation that were important to their study: intelligibility, comprehensibility, and accentedness. They have had a significant influence on pronunciation research afterward. The concept of intelligibility was depicted as “the extent to which an utterance (a speaker’s message) is actually understood” (Munro and Derwing 1995a: 76; Munro and

Derwing 1995b: 291). Intelligibility was also defined as "the apprehension of the message in a sense intended by the speaker" (Nelson 1984: 63). Munro and Derwing (1995a) and Derwing and Munro (1997) used a listeners' orthographic transcription to measure the intelligibility of L2 speech. Given this definition, intelligibility seems that it has closely something to the accuracy of L2 speech. Comprehensibility was defined as "listeners' perceptions of difficulty in understanding particular utterances" (Munro and Derwing 1995b: 291). In their latter study, comprehensibility was described as "judgments on a rating scale of how difficult or easy an utterance is to understand" (Derwing and Munro 1997: 2). This means that comprehensibility represents an effort on the part of the listeners. Comprehensibility was assessed by the speech samples, which were measured with Likert-type scales. However, the judgment of the difficulty might vary depending on the listeners' educational experience. It was proven if the listeners who had more experience in a certain foreign language and got used to L2 learners' speech, they had less difficulty understanding the speakers' utterances (Kennedy and Trofimovich 2008). The notion of a foreign accent was reinforced by the clarified definition as "non-pathological speech that differs in some noticeable respects from native speaker pronunciation norms" (Munro and Derwing 1995b: 289). Kennedy and Trofimovich (2008) defined a foreign accent as "how closely the pronunciation of an utterance approaches that of a native speaker." Even though L2 with a foreign accent was not necessarily deleterious for conveying meaning, some non-target-like pronunciation features might seriously interrupt efficient communication. Therefore, this is the reason why the priority of pronunciation instruction should be to make learners' pronunciation understandable (Thomson 2017: 12).

Fukuta and Yamashita (2015) applied three assessment criteria: syntactic complexity, accuracy, and fluency. Syntactic complexity was counted in the clauses per AS (Analysis of Speech). The AS-unit was proposed by Foster et al. (2000). It refers to "a single speaker's utterance consisting of an independent clause, or sub-clausal unit, together with any subordinate clause(s) associated with either." (Fukuta and Yamashita 2015: 365). The percentage of error-free AS units measured accuracy. Pruned words per minute assessed fluency. The term "pruned words" refers to the number of words excluding self-repaired words or words that the speaker repeated (Foster et al. 2000).

Ghanem and Kang (2017) described two categories of pronunciation features: which were segmental features and suprasegmental features, used in speaking scales of current standardized tests such as CELA (Cambridge English Language Assessment), TOEFL

iBT, and IELTS. Segmental features consist of the speaker's deviation from a norm, the articulation of individual sounds, flow and clarity of the speech, segmental errors, intonation patterns, and overall intelligibility. Suprasegmental features can be divided into fluency features and prosodic features. Fluency is whether the production flows easily. Speech rate and pauses have been identified as significant factors that raters consider when evaluating fluency of speech. L1 influence and pause location are also criteria influencing the rater's rating of fluency. As for prosodic features, notably, intonation has been recently added to revised versions of the test descriptor CELA tests. It describes intonation as how "the voice rises and falls, e.g., to convey the speaker's mood, to support the meaning or to indicate new information" (Cambridge English Handbook for Teachers 2015: 89).

With technology development, it has been attempted to apply various kinds of computer software such as Praat, which can illustrate several dimensions of pronunciation: voice onset timing, vowel formants, vowel duration measurement, pauses, stress, prominence, and tone choice (Ghanem and Kang 2017). Computer technology such as ASR (Automatic Speech Recognition) for assessing pronunciation (Kitzing et al. 2009) is also actively in progress. Bernstein et al. (2010) proved that the scores from the automated tests were strongly correlated with the scores from oral proficiency interviews across languages.

3. Research Methodology

3.1 Participants

In order to investigate the effects of PA and OA on different levels of Thai KFL learners, the participants were recruited from a K1 (Korean 1) course, beginner level, and a KC1 (Korean Conversation 1)[1], upper beginner level at MFU (Mae Fah Luang University). The participants were recruited from Nov. 8 to Nov. 23, 2021 by sharing information about the current research in an online class[2] and instructed them to place

1 The learners of KC1 have completed K1 course in the previous semester (second semester, 2020). Therefore, there are 45 hours of learning time gap between two groups.

2 Due to the outbreak of Covid 19, all the classes were conducted fully online in keeping with the regulation of the university during the whole semester of 2021-1.

research consent forms in Google Drive. The current study was approved by the ethics committee of MFU on Oct. 18th, 2021. The total number of Thai KFL learners who participated in this study and were qualified[3] was 79. The 40 students were from the K1 course, who had studied Korean for at least 45 hours, and 39 students were from the KC1 course, who had studied Korean for at least 90 hours. The third-year students account for 57.0%. Non-language majors account for 69.6%. Female participants account for 91.1%, while male participants account for 8.9%.

Table 1. The composition of the participants

Year	N	%	Major	N	%	Gender	N	%
3rd year	45	57.0	Non-language major (Management, IT, etc.)	55	69.6	Female	72	91.1
4th year	30	38.0	Language major (Chinese, English)	24	30.4	Male	7	8.9
1,2,5 year	4	5.0		79	100		79	100
	79	100						

3.2 Research Tools

The task format of PA and OA was adapted from Yeon (2012). This research aimed to examine the effects of PA and OA in different domains. Therefore, the tasks were modified to have three domains of PA and OA respectively. To acquire validity of the tasks, after task papers were developed by the researcher, they were reviewed by two experienced Korean educators who had taught or have been teaching the Korean language in Thailand. The reliability of the tasks was estimated based on internal consistency by utilizing Cronbach α.

The oral text of PP was taken from the speaking test, which is a performance assessment accounting for 10% of learners' grades. but the results of the assessment of PP were not included in their grades. Learners' PP was assessed by a five-point scoring rubric, which contains three criteria such as accuracy, fluency, and intonation. The reliability of the assessment of PP was also estimated based on internal consistency by utilizing Cronbach α.

3 Initially, 82 learners participated in this study. However, 3 learners' responses in the K1 course had to be eliminated from the data processing and data analysis because 2 learners had already studied the Korean language for more than 1 year and the other learner missed the PA task.

3.2.1 PA Task

To measure PA, the phoneme detection task was created to find the learners' ability to differentiate the phonemes in a spoken word. The original PA tasks of Yeon (2012) have 20 items of questions for differentiating initial phonemes, and another 20 items for final phonemes. But this study added the items for differentiating vowel phonemes to investigate whether the different domains of PA (initial phoneme, final phoneme, vowel phoneme) might have different extents of effect on PP. The final version of the PA task was comprised of three domains in 30 questions: 10 questions for differentiating initial phonemes, 10 for final phonemes, and 10 for vowels. The learners were instructed to listen to the teacher's saying one time and then to choose one non-word of which initial, final, or vowel phonemes are different from the rest. The identical PA tasks were applied for K1 and KC1 learners. Below is the example of PA tasks of initial phoneme for two groups.

(2) 1. ① 쿰 ② 굴 ③ 군

Developing the questions for the vowel phoneme awareness, the researcher considered realistic Korean pronunciation, not theoretical pronunciation. Therefore, some vowels that are difficult to distinguish from the other when they are pronounced on the unit of one syllable, such as the pairs of ㅐ and ㅔ, the pairs of ㅒ and ㅖ, and the pairs of ㅚ, ㅙ, ㅞ were excluded from the task items. The Cronbach α coefficients for the scores of PA was .825.

3.2.2 OA Task

The format of the OA task was also taken from Yeon (2012), but the difficulty level of questions did not seem appropriate for beginner level KFL learners. As the participants of Yeon (2012) were native Korean children, the words in the task items were considerably difficult for KFL learners. Therefore, a new OA task was developed by the researcher and reviewed by two external Korean teachers. The learners were asked to choose the most appropriate Korean spelling, equivalent to English sentences' meaning. 30 question items were taken from the textbook they have learned from throughout the

first semester of 2021. The task items were divided into three parts: 10 items are relevant with initial consonant awareness, 10 items with final consonant awareness, and another 10 items with vowel awareness. The Cronbach α coefficients for the scores of OA was .820. The different OA tasks were applied since OA questions were created based on the textbook contents. Below is the example of OA tasks of initial consonants for K1 learners.

(3) 1. □□□ 두 개 주세요. (Please give me 2 erasers.)
① 지우개 ② 기우개 ③ 치우개 ④ 시우개

3.2.3 Development of speaking test and the rubric for assessing PP

The speaking test was developed based on the textbook contents of K1 and KC1. The K1 speaking test was comprised of 5 questions (telling time, constructing a sentence including place and verb on the designated time, making the sentence including place and verb on designated days of the week, explaining the location of stuff, and explaining the location of a specific building).

The KC1 speaking test was comprised of 8 questions (ordering two dishes at a restaurant, saying the names of restaurant stuff in Korean, telling the future, telling symptoms, telling reason and result, saying "can I try this on?" depending on the items, saying the feeling after trying on the clothing and asking another size, explaining the situation and asking for help).

The rubric was developed to assess learners' PP using three criteria: accuracy, fluency from Fukuta and Yamashita (2015), and intonation from Ghanem and Kang (2017). In each criterion, a five-point scoring system was applied in a rubric of pronunciation assessment (See Appendix 5). The Cronbach α coefficient for the assessment of PP was .875.

The criterion of accuracy was modified from segmental features because segmental features were closely related to intelligibility that is, how much the learner's pronunciation conveyed the intended meaning. The accuracy of PP was assessed based on how much the learners' articulation was clear and accurate. The criterion of fluency was assessed by examining how much the flow of utterance was natural without improper pause or hesitation. The criterion of intonation was modified from prosodic features. The intonation was assessed based on how much the learners implemented the natural rising

and falling of the oral speech depending on the context. Even though the Korean language does not have any tones on each syllable, intonation plays a vital role in clear and efficient communication. For example, declarative and interrogative sentences are the same because the subjects are often omitted in the Korean language. The only differences are punctuation marks in a written text and intonation in an oral text. Below is an example of this case.

(4) 학생이에요. (I am a student.) in a declarative sentence
학생이에요? (Are you a student?) in an interrogative sentence

As shown in the example above, to convey the exact intention, the learners should know the intonation principle; in declarative sentences, the intonation should fall, whereas in interrogative sentences it should rise. Therefore, intonation also matters for intelligible and comprehensible communication in the oral context.

3.3 The data collection & analysis

3.3.1 PA & OA Tasks

PA and OA tasks were conducted on Nov. 22, 2021, for the K1 class, and for the KC1 class on Nov. 23 and 24, 2021, through Google forms on Google Meet, the online platform. The students were assured that these tasks had no bearing on their scores and the whole procedure of the tasks was recorded. The students were guided to keep their cameras on to prevent them from referring to any materials. The results of PA and OA tasks were graded by the researcher and used for research purposes only.

3.3.2 Assessment of PP

The K1 speaking test was carried out on Nov. 29, 2021, and the KC1 speaking test was on Nov. 30, 2021 and Dec. 1, 2021, via the online platform, Google Meet. The learners' speaking performance was evaluated by the researcher based on a real-time based live test. The average elapsed time per learner was 5-6 mins for K1 and 8-10 mins for KC1. The average scores of the speaking test were 6.08 (SD: 2.146) out of 10 for

K1, and 13.38 (SD: 4.256) out of 20 for KC1. Throughout the exam, the speaking test was captured in the form of a video clip utilizing the recording tool in Google Meet.

This video clip was turned into an audio file to protect learners' picture rights and was used to evaluate learners' PP. To guarantee the objective evaluation of PP, three native Korean language teachers were recruited for evaluating the learners' pronunciation. The orientation for the evaluators was carried out on Dec. 17, 2021, via Google Meet. The objectives of the current research were shared, and the rubric of pronunciation assessment were explained and discussed. After that, the files of the rubric and audio files were placed on Google drive so that the evaluators get to access them freely. The learners' PP has been evaluated by three external Korean educators by the semi-direct method of spoken language (Bernstein et al. 2010: 356) from the middle of December 2021 to the end of January 2022. After collecting the scores and the report of error types and aspects of PP from the external educators, the researcher integrated the data. Each learner's score of three domains of PP (accuracy, fluency, intonation; Max of each domain is 5) was averaged from the original scores provided by three educators.

3.3.3 The data analysis

The results of PA and OA tasks were analyzed through the ratio of the correct answer and descriptive statistics in SPSS (Statistical Package for the Social Sciences), and an independent sample t-test to find whether the 2 groups' averages of PA and OA tasks are statistically significant or not. The results of PP were analyzed by the ratio of the error frequencies and descriptive statistics in SPSS and an independent sample t-test to determine whether the 2 groups' averages of PP are statistically significant or not. The correlations of PA and PP, OA and PP were examined by using correlation analysis in SPSS. The contribution of the variables of PA and OA on PP was examined by using multiple regression analysis in SPSS.

4. Findings

4.1 The results of PA & OA tasks and PP

The PA mean score for the beginner group (K1) was 18.35 (Max: 30), which was

slightly higher than the upper beginner group (KC1) which scored 17.00. However, the result of an independent sample t-test indicates the difference in the mean score of PA is not statistically significant (t=1.918 p=.059>0.05). The results suggest that the gap of 45 hours of learning time has no major influence on the development or improvement of PA. The mean score of domains of PA in the combined groups (N=79) appears in this order; final phoneme (7.58 out of 10), initial phoneme (6.89 out of 10), and vowel phoneme (6.82 out of 10). The results indicate that the differentiation of the final phonemes is easier than those of initial phonemes and vowel phonemes since there are only seven phonemes in the final phonemes.

The OA mean score for the upper beginner group (KC1) was 23.79 (Max:30), which was slightly higher than the beginner group (K1) which scored 23.05. However, the result of an independent sample t-test indicates the difference in the mean score of OA is not statistically significant (t=-.763 p=.448>0.05). This indicates that OA also does not seem to be developed or improved in a short period of time. The mean score of combined groups' OA appears in this order: initial consonant (8.27 out of 10), final consonant (8.11 out of 10), and vowel (7.04 out of 10). It shows that the OA of final consonants is more complicated than initial consonants because it has various possibilities of orthography even though they are phonologically the same.

The PP mean score for the beginner group (K1) was 9.48 (Max: 15), which was slightly higher than the upper beginner group (KC1) which scored 9.4o. However, the result of an independent sample t-test shows that the difference in the mean score of PP is not statistically significant (t=.185 p=.854>0.05) This reveals that PP also cannot be developed rapidly in the short term. The mean score of the combined groups' PP appeared in this order: intonation (3.35 out of 5), accuracy (3.08 out of 5), and fluency (3.01 out of 5). The results indicate that beginner-level learners have the most difficulty speaking Korean without improper pauses or hesitation in terms of fluency. Descriptive statistics of PA & OA and PP for 79 learners are found in table 2.

Table 2. Descriptive statistics of PA & OA and PP

		Max	Mean	SD	N
PA	initial phoneme	10	6.89	2.094	79
	final Phoneme	10	7.58	2.010	
	vowel Phoneme	10	6.82	1.838	
	Total of PA	30	21.29	4.737	
OA	initial Consonant	10	8.27	1.567	79
	final Consonant	10	8.11	1.941	
	vowel	10	7.04	1.971	
	Total of OA	30	23.42	4.325	
PP	accuracy	5	3.08	0.680	79
	fluency	5	3.01	0.781	
	intonation	5	3.35	0.595	
	Total of PP	15	9.44	1.946	

4.2 The correlation analysis between PA & PP and OA & PP

Since it was verified that there was no difference in PA and OA scores between the K1 group and the KC1 group, correlation analysis[4] was administered on the combined group (N=79). The correlation analysis between PA & PP reveals that the accuracy of PP was correlated in the order of final phoneme (r=.434 p<.001), vowel phoneme (r=.326 p=.003), and initial phoneme (r=.295 p=.008). The fluency of PP was correlated in the same order as the accuracy of PP: final phoneme (r=.419 p<.001), vowel phoneme (r=.367 p=.001), and initial phoneme (r=.267 p=.017). The intonation of PP was correlated in the order of final phoneme (r=.382 p=.001), vowel phoneme (r=.242 p=.032), however, there was no correlation between intonation and initial phoneme (r=.201 p=.076). Consequently, the strongest correlation was found in the relationship between final phonemes and three domains of PP in this order: accuracy (r=.434 p<.001), fluency (r=.419 p<.001), and intonation (r=.382 p=.001). Therefore, it can be inferred that the awareness of the final phonemes is the most significant factor among the three domains of PA in the Korean language.

4 This is the guideline for interpreting the strength of the relationship by checking Pearson r, the correlation coefficient.
The strength of the relationship is small: if r ranges from .10 to .29
The strength of the relationship is medium: if r ranges from .30 to .49
The strength of the relationship is large: if r ranges from .50 to 1
<https://latrobe.libguides.com/ibmspss/correlation>

The correlation analysis between OA & PP reveals that the accuracy of PP was correlated in the order of final consonant (r=.463 p<.001), vowel (r=.323 p=.004), and initial consonant (r=.237 p=.036). The fluency of PP was correlated in the same order as the accuracy of PP: final consonant (r=.527 p<.001), vowel (r=.355 p=.001), and initial phoneme (r=.253 p=.024). The intonation of PP was correlated in a different order: final consonant (r=.486 p<.001), initial consonant (r=.319 p=.004), and vowel (r=.265 p=.018). As for intonation, initial consonant awareness was more correlated than vowel awareness. Consequently, the strongest correlation was found in the relationship between the final consonants and three domains of PP in this order: fluency (r=.527 p<.001), intonation (r=.486 p<.001), and accuracy (r=.463 p<.001). Therefore, it can be inferred that the awareness of the final consonants is the most significant factor among the three domains of OA in the Korean language. Additionally, if the coefficients of PA and OA are simply compared, the coefficients of OA are higher than those of PA in all three domains of PP.

Table 3. Correlation analysis between PA & PP and OA & PP (N=79)

Correlation between PA and PP				Correlation between OA and PP			
	initial phoneme	final phoneme	vowel phoneme		initial consonant	final consonant	vowel
initial phoneme	1			initial consonant	1		
final phoneme	.592**	1		final consonant	.374**	1	
vowel phoneme	.341**	.410**	1	vowel	.412**	.495**	1
accuracy	.295**	.434**	.326**	accuracy	.237*	.463**	.323**
fluency	.267*	.419**	.367**	fluency	.253*	.527**	.355**
intonation	.201	.382**	.242*	intonation	.319**	.486**	.265*

**Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

4.3 The regression analysis

4.3.1 Predictors of PA and OA variables toward the accuracy of PP

First, multiple regression was carried out to investigate whether PA variables could significantly predict the accuracy of PP. The result of the regression indicated that the model explained 21.6% of the variance and that the model was a significant predictor

of the accuracy of PP, F(3,75)=6.877, p<.001. Final phoneme awareness contributed significantly to the model (B=.116, p=.011), whereas initial phoneme awareness (B=.010, p=.806) and vowel phoneme awareness (B=.064 p=.128) did not.

Second, multiple regression was also carried out to investigate whether OA variables could significantly contribute to the accuracy of PP. The result of the regression indicated that the model explained 22.7% of the variance and that the model was a significant predictor of the accuracy of PP, F(3,75)=7.352, p<.001. Final consonant awareness (B=.137, p=.002) contributed significantly to the model, whereas initial consonant awareness (B=.019, p=.696) and vowel awareness (B=.038, p=.363) did not.

Table 4. Regression analysis summary for PA and OA variables predicting the accuracy of PP

	Variables	B	95% CI	β	t	p
PA	Initial Phoneme Awareness	.010	[-.073, .093]	.032	.246	.806
	Final Phoneme Awareness	.116	[.028, .205]	.344	2.611	.011
	Vowel Phoneme Awareness	.064	[-.019, .148]	.174	1.540	.128
	Note: R2=.216 (N=79, p< .05), CI=Confidence Interval for B					
OA	Initial Consonant Awareness	.019	[-.079, .118]	.045	.392	.696
	Final Consonant Awareness	.137	[.053, .220]	.391	3.267	.002
	Vowel Awareness	.038	[-.045, .122]	.111	.914	.363
	Note: R2=.227 (N=79, p<0.01), CI=Confidence Interval for B					

4.3.2 Predictors of PA and OA variables toward the fluency of PP

First, multiple regression was carried out to investigate whether PA variables could significantly contribute to the fluency of PP. The result of the regression indicated that the model explained 22.1% of the variance and that the model was a significant predictor of fluency of PP, F(3,75)=7.111, p<.001. Final phoneme awareness (B=.126, p=.015) and vowel phoneme awareness (B=.100, p=.040) contributed significantly to the model, whereas initial phoneme awareness (B=-.002, p=.963) did not.

Second, multiple regression was also carried out to investigate whether OA variables could significantly contribute to the fluency of PP. The result of the regression indicated that the model explained 29.0% of the variance and that the model was a significant predictor of fluency of PP, F(3,75)=10.219, p<.001. Final consonant awareness (B=.184, p<.001) contributed significantly to the model, whereas initial consonant awareness

(B=.018, *p*=.747) and vowel awareness (B=.046, *p*=.328) did not.

Table 5. Regression analysis summary for PA and OA variables predicting the fluency of PP

	Variable	B	95% CI	β	t	p
PA	Initial Phoneme Awareness	-.002	[-.097, .093]	-.006	-.046	.963
	Final Phoneme Awareness	.126	[.025, .228]	.326	2.478	.015
	Vowel Phoneme Awareness	.100	[.005, .196]	.236	2.092	.040
	Note: R2=.221 (N=79, p<.05), CI=Confidence Interval for B					
OA	Initial Consonant Awareness	.018	[-.091, .126]	.035	.323	.747
	Final Consonant Awareness	.184	[.092, .275]	.457	3.983	<.001
	Vowel Awareness	.046	[-.047, .138]	.115	.984	.328
	Note: R2=.290 (N=79, p<.001), CI=Confidence Interval for B					

4.3.3 Predictors of PA and OA variables toward the intonation of PP

First, through multiple regression, it was investigated whether PA Variables could significantly predict the intonation of PP. The result of the regression indicated that the model explained 15.7% of the variance and that the model was a significant predictor of intonation of PP, F(3,75)=4.654, *p*=.005. Final phoneme awareness (B=.110, *p*=.008) contributed significantly to the model, whereas initial phoneme awareness (B=-.016, *p*=.676) and vowel phoneme awareness (B=.035, *p*=.357) did not.

Second, through multiple regression, the researcher investigated whether OA variables could significantly predict the intonation of PP. The result of the regression indicated that the model explained 25.9% of the variance and that the model was a significant predictor of intonation of PP, F(3,75)=8.717, *p*<.001. Final consonant awareness (B=.133, *p*<.001) contributed significantly to the model, whereas initial consonant awareness (B=.063, *p*=.145) and vowel awareness (B=-.005, *p*=.889) did not.

Table 6. Regression analysis summary for PA and OA variables predicting the intonation of PP

	Variable	B	95% CI	β	t	p
PA	Initial Phoneme Awareness	-.016	[-.091, .059]	-.056	-.419	.676
	Final Phoneme Awareness	.110	[.029, .190]	.371	2.712	.008
	Vowel Phoneme Awareness	.035	[-.040, .111]	.109	.927	.357
	Note: R2=.157 (N=79, p<.01), CI=Confidence Interval for B					
OA	Initial Consonant Awareness	.063	[-.022, .147]	.165	1.473	.145
	Final Consonant Awareness	.133	[.061, .204]	.433	3.696	<.001
	Vowel Awareness	-.005	[-.077, .067]	-.017	-.140	.889
	Note: R2=.259 (N=79, p<.001), CI=Confidence Interval for B					

4.3.4 Predictors of PA and OA variables toward the total score of PP

Multiple regression was carried out to investigate whether PA and OA variables could significantly predict the total score of PP. The result of the regression indicated that the model explained 31.0% of the variance and that the model was a significant predictor of the total score of PP, F(6,72)=5.400, p<.001. Only final consonant awareness of OA (B=.337, p=.026) contributed significantly to the model.

Table 7. Regression analysis summary for PA and OA variables predicting the total score of PP

	Variable	B	95% CI	β	t	p
PA	Initial Phoneme Awareness	-.070	[-.308, .168]	-.075	-.585	.561
	Final Phoneme Awareness	.179	[-.122, .481]	.185	1.188	.239
	Vowel Phoneme Awareness	.156	[-.139, .451]	.147	1.054	.296
OA	Initial Consonant Awareness	.174	[-.119, .467]	.140	1.182	.241
	Final Consonant Awareness	.337	[.042, .633]	.336	2.277	.026
	Vowel Awareness	-.042	[-.339, .255]	-.043	-.284	.777
	Note: R2=.310 (N=79, p<.05), CI=Confidence Interval for B					

4.3.5 Comparison of the weights of predictors of PA and OA variables toward PP

Furthermore, the weight of predictors of PA and OA was compared in three domains of PP: accuracy, fluency, and intonation. The weight of OA was higher than PA in all three domains of PP. It can be interpreted that if the learners have a high level of OA, it is likely that they may show a good level of PP in terms of accuracy, fluency, and

intonation whereas PA was not such a strong predictor of PP. PA had the highest effect on fluency (22.1%) whereas it had the least effect on intonation (15.7%). OA also had the highest effect on fluency (29.0%) whereas it had the least effect on accuracy (22.7%). The gap in the weight of predictors of PA and OA appeared in this order: intonation (10.2%), fluency (6.9%), and accuracy (1.1%). Figure 1 demonstrates that OA affects Thai KFL learners' PP more than PA in terms of accuracy, fluency, and intonation respectively.

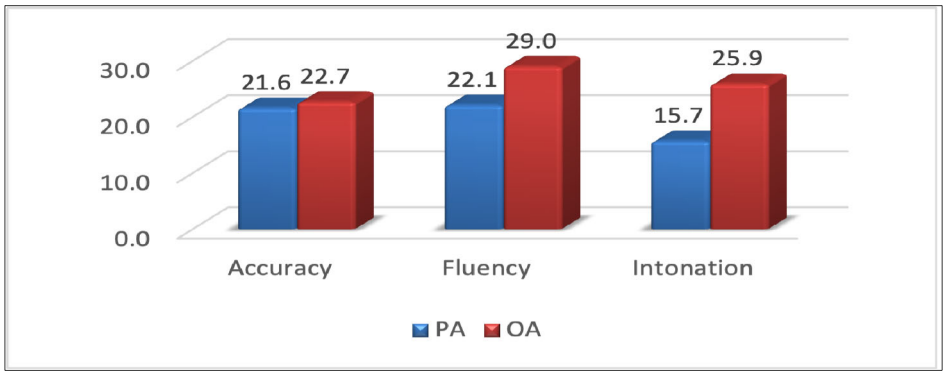

Figure 1. Comparison of the weight of predictors of PA and OA variables toward PP

5. Discussion and conclusion

The purpose of this study is to examine the effects of beginner-level Thai KFL learners' PA and OA on their PP. PA and OA tasks were carried out with 2 target groups, which were divided by 45 hours of learning time gap. The researcher designated the K1 class as a beginner group, whose learning time in Korean is a minimum of 45 hours. Another class, KC1, was designated as an upper beginner group, whose learning time in Korean was a minimum of 90 hours because they had completed the K1 course in the previous semester. The result of an independent sample t-test, however, revealed that there were no differences between these two groups in the scores of PA and OA tasks and PP. Therefore, it was found that the difference in average learning time of 45 hours does not bring about a difference in Korean PA and OA tasks and PP. It reflects that MLA and PP do not develop rapidly in a short term. Therefore, at the phase of data analysis, the researcher combined 2 classes of participants (N=79).

As a result of examining the correlation between the learner's PA and PP, it is shown that the final phoneme awareness has the strongest correlation in the order of accuracy, fluency, and intonation of PP. In the correlation between OA and PP, it is found that the final consonant awareness has the strongest correlation in the order of fluency, intonation, and accuracy of PP. The findings from multiple regression analyses display that the final phoneme awareness of PA and final consonant awareness of OA contributed significantly to the accuracy of PP, accounting for 21.6% and 22.7% respectively (RQ 1). The final phoneme awareness and vowel phoneme awareness of PA and final consonant awareness of OA contributed significantly to the fluency of PP, accounting for 22.1% and 29.0% respectively (RQ 2). The final phoneme awareness of PA and final consonant awareness of OA contributed significantly to the intonation of PP accounting for 15.7% and 25.9% respectively (RQ 3). The results imply that final phoneme awareness of PA and final consonant awareness of OA play a pivotal role in learners' PP in the Korean language. However, the result of the regression analysis of six PA & OA variables on the total score of PP indicates that only final consonant awareness of OA contributed significantly to the model up to 31.0%. Furthermore, when the weight of predictors of PA and OA is compared, OA outweighs PA in all three domains of PP. This manifests that OA has a greater impact on learners' PP than PA in the Korean language. If some learners lack adequate competence in OA, they might struggle with PP in terms of accuracy, fluency, and intonation. In contrast, if the learners have a high degree of OA competence it is likely that they will also have a high level of PP.

Several studies showed that OA had a greater significance than PA to contribute to learners' language acquisition (Zirps 1990; Holopainen et al. 2020). The emphasis on OA, however, does not seem to fit the trend of CLT. Under the CLT environment, language educators don't put much focus on orthography. The correlation between MLA and PP and the effects of MLA on PP have been rarely examined. Furthermore, the role of OA as a predictor of PP has been seldomly explored. It is not easy to consider the contribution of OA to PP. However, the remarkable effect of OA in speech production has been reported in numerous research in several language contexts: English, Chinese, Japanese, etc. (Damian and Bowers 2003; Zhang and Damian 2012; Saletta et al. 2016; Bassetti 2017; Li and Wang 2017; Saletta 2019; Yoshihara et al. 2020; Dylman et al. 2022). The researchers usually used the method of word-naming and picture-naming tasks. For instance, Damian and Bowers (2003) asked participants to perform timed naming responses to target pictures, which are orthographically similar or different words,

and through calculating response latencies, the results were drawn that even in speech production tasks, orthographic codes are automatically activated and contribute to lexical retrieval. However, there are also some inconsistent findings that argue OA effects were not found in spoken word production (Roelofs 2006; Alario et al. 2007; Stoehr and Martin 2022).

The effect of OA needs to be interpreted carefully depending on the settings of the studies. Results might vary depending on whether the study was employed on L1 speakers or L2 learners (Bassetti 2017). In addition, the orthography depth of a certain language should be considered as a factor influencing the research outcome. However, based on the findings from recent studies dealing with the relation between OA and speech production, the trend has been winning that acknowledges OA effects on speech production. Castro-Caldas et al. (1998) also argued that learning the written form of language (orthography) interacts with the function of oral language. Therefore, rather than underrating OA as just a memorizing skill, educators should recognize the significance of OA (Joshi et al. 2008) and try to provide explicit instructional strategies that enable to enhance learners' OA for upgrading learners' PP.

If we discuss more focusing on the Korean language, in the present study, final phoneme awareness of PA and final consonant awareness of OA were elicited as the most significant MLA domains. Kim (2007) also reported that native Korean children's body-coda awareness (final phoneme awareness) was an important predictor of word decoding and spelling in the Korean language. As the researcher mentioned earlier, in the Korean language, final phonemes and final consonants are relatively more complicated than initial phonemes and initial consonants. Therefore, Korean language educators should take note of this when they implement pronunciation instruction. Especially the final consonant awareness of OA in the field of Korean language teaching should be highlighted to learners. It will be desirable that the Korean language educators exert designing explicit instruction about final consonant awareness of OA to improve learners' accuracy, fluency, and intonation of PP. From the learners' side, to enhance PP, they should pay more attention to the final consonant awareness of OA.

The limitations of the present study are found in 3 aspects. First, when it comes to MLA, it is optimal to examine it in 3 domains of PA, OA, and MA. But since the Korean proficiency level of the participants in this study was beginner, it was regarded that the MA task was beyond their ability. Therefore, MA task was not implemented. Second, PA and OA tasks have limitations in measuring the whole aspects of

meta-linguistic skills. For instance, the PA task used in the current study is a phoneme detection task, which requires learners to distinguish and detect different phonemes. However, learners' ability to manipulate phonemes, such as deleting or blending phonemes, was not tested. As for the OA task, because the learners' Korean words were limited, the words shown in the task were taken from the textbook. The task tended to have more focus on the knowledge about specific words than an extensive range of orthography. Third, since participants of this study were limited to undergraduate students from a university in Thailand, and their Korean proficiency levels were beginner, it still has limitations for generalizing the results for all KFL education fields. Despite these limitations, the current study is still meaningful in the ways that the results show the remarkable effect of OA on the Thai KFL learners' PP, and final consonant awareness of OA is elicited as the most significant domain of OA in the Korean language.

As for a further study, first, it will be intriguing to conduct the same study for intermediate or advanced level learners, so that the study might show whether the effects of PA and OA are different depending on the proficiency level. Second, it will be a valuable attempt to examine the effects of PA and OA on the PP of Korean TFL (Thai as a Foreign language) learners who study Thai as a Foreign language at the beginner level, for Thai and Korean have some common characteristics in final phonemes and final consonants.

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Appendix 1

Phonological awareness task for teachers

※ Listen carefully and choose the one of which the initial phoneme is different from the rest (1-10).					
initial phoneme practice items	건	순	갈		
	늡	뭉	만		
	찰	춧	훈		
1	쿰	굴	군	ㅋ[k^h] ㄱ[k][5]	ㅋ
2	찹	잘	창	ㅈ[c] ㅊ[c^h]	ㅈ
3	사	조	지	ㅅ[s] ㅈ[c]	ㅅ
4	퍼	뵤	피	ㅂ[p] ㅍ[p^h]	ㅂ
5	무	배	뷰	ㅁ[m] ㅂ[p]	ㅁ
6	쥰	저	권	ㅈ[c] ㄱ[k]	ㄱ
7	딜	통	턴	ㄷ[t] ㅌ[t^h]	ㄷ
8	갭	꼴	급	ㄱ[k] ㄲ[k']	ㄲ
9	흩	핸	퓸	ㅎ[h] ㅍ[p^h]	ㅍ
10	릭	놉	랜	ㄴ[n] ㄹ[r]	ㄴ
※ Listen carefully and choose the one of which the final phoneme is different from the rest (11-20).					

5 The symbols were presented according to IPA(international phonetic alphabet). https://blog.daum.net/flowersym1970/87

final phoneme practice items	실	감	삼		
	봄	곰	학		
	색	뇽	맹		
11	낻	작	칻	ㄷ[t] ㄱ[k]	ㄱ
12	완	광	황	ㄴ[n] ㅇ[ŋ]	ㄴ
13	욧	켠	면	ㅅ[t] ㄴ[n]	ㄷ
14	핏	딧	츱	ㄷ[t] ㅂ[p]	ㅂ
15	샌	뇰	밸	ㄴ[n] ㄹ[l]	ㄴ
16	웜	좡	볌	ㅁ[m] ㅇ[ŋ]	ㅇ
17	밀	됀	닌	ㄴ[n] ㄹ[l]	ㄹ
18	콥	썹	떳	ㅂ[p] ㅅ[t]	ㄷ
19	합	팝	딤	ㅁ[m] ㅂ[p]	ㅁ
20	냅	작	캅	ㄱ[k] ㅂ[p]	ㄱ
※ Listen carefully and choose the one of which vowel phoneme is different from the rest (21-30).					
vowel phoneme practice items	버	조	호		
	겨	뇨	벼		
	뭐	뷔	풔		
21	추	듀	휴	ㅜ ㅠ	ㅜ
22	머	너	로	ㅓ ㅗ	ㅗ
23	카	차	튀	ㅏ ㅟ	ㅟ
24	프	뤼	느	ㅡ ㅟ	ㅟ
25	교	쇼	도	ㅗ ㅛ	ㅗ
26	사	처	커	ㅏ ㅓ	ㅏ
27	갸	사	뱌	ㅏ ㅑ	ㅏ
28	쳐	더	퍼	ㅓ ㅕ	ㅕ
29	포	툐	교	ㅗ ㅛ	ㅗ
30	슈	푸	튜	ㅜ ㅠ	ㅜ

Appendix 2

Phonological awareness task for K1 & KC1 Learners

※ Listen carefully and choose the one of which the initial phoneme is different from the rest (1-10).			
initial phoneme practice items	①	②	③
	①	②	③
	①	②	③
1	①	②	③
2	①	②	③

3	①	②	③
4	①	②	③
5	①	②	③
6	①	②	③
7	①	②	③
8	①	②	③
9	①	②	③
10	①	②	③
※ Listen carefully and choose the one of which the final phoneme is different from the rest (11-20).			
final phoneme practice items	①	②	③
	①	②	③
	①	②	③
11	①	②	③
12	①	②	③
13	①	②	③
14	①	②	③
15	①	②	③
16	①	②	③
17	①	②	③
18	①	②	③
19	①	②	③
20	①	②	③
※ Listen carefully and choose the one of which vowel phoneme is different from the rest (21-30).			
vowel phoneme practice items	①	②	③
	①	②	③
	①	②	③
21	①	②	③
22	①	②	③
23	①	②	③
24	①	②	③
25	①	②	③
26	①	②	③
27	①	②	③
28	①	②	③
29	①	②	③
30	①	②	③

Appendix 3

Orthographic awareness task for K1 learners

※ Choose the most appropriate spelling and mark it on this paper.

◈ Initial consonants

1. □□□ 두 개 주세요. (Please give me 2 erasers.)
①지우개 ②기우개 ③치우개 ④시우개
2. 저는 □□에 있어요. (I am in the restaurant.)
①딕당 ②식당 ③칙당 ④직당
3. □□가 얼마예요? (How much is this pants?)
①마지 ②빠지 ③바지 ④파지
4. 저는 한국 □□가 있어요. (I have Korean friends.)
①틴구 ②친구 ③진구 ④신구
5. □□ 사람이에요. (He's German.)
①독일 ②톡일 ③곡일 ④콕일
6. □□ 주세요. (Green tea please.)
①돋차 ②몸차 ③록차 ④녹차
7. □□ 주세요. (Notebook please.)
①공책 ②콩책 ③꽁책 ④농책
8. □□ 있어요. (I have a pencil.)
①연삘 ②연밀 ③연필 ④연빌
9. □□이에요. (I am a student.)
①칵생 ②착생 ③탁생 ④학생
10. 저는 □□□ 사람이에요. (I am Russian.)
①머시아 ②러시아 ③너시아 ④퍼시아

◈ Final consonants

11. □ 개 있어요? (How many do you have?)
①몃 ②멷 ③몃 ④몇
12. □□이에요. (It's a dictionary.)
①사절 ②사젇 ③사전 ④사점
13. □□이에요. (It is a bag.)
①가밤 ②가밥 ③가방 ④가반
14. 커피 □□□. (We don't have coffee.)
①업어요 ②없어요 ③엃어요 ④엇어요
15. 저는 모자가 □□□. (I have many caps.)
①많아요 ②만아요 ③맚아요 ④맋아요

16. □□□? (Is it correct?)
①맡아요 ②맞아요 ③맏아요 ④맛아요
17. 감사□□□. (Thank you.)
①핟니다 ②합니다 ③함니다 ④핲니다
18. 가위 □□ 개 있어요. (I have 8 scissors.)
①여덞 ②여덥 ③여덜 ④여덟
19. 여기는 □□이에요. (This is a hospital.)
①병웝 ②병웜 ③병원 ④병월
20. □□이 뭐예요? (What is your name?)
①이릇 ②이릎 ③이름 ④이름

◆ **Vowels**

21. □□□ 있어요. (We have lemon tea.)
①래몬차 ②래문차 ③레몬차 ④레문차
22. 저는 미나□□/□□□. (I am Mina.)
①이에요 ②예요 ③에요 ④이예요
23. □□ 있어요? (Do you have eyeglasses?)
①안겅 ②안경 ③안걍 ④안굥
24. □□ 가 얼마예요? (How much is this clock?)
①시게 ②시괘 ③시궤 ④시계
25. 책 두 □ 있어요. (I have 2 books.)
①권 ②관 ③궨 ④괜
26. 사 □에 있어요. (It's on the 4th floor.)
①충 ②총 ③청 ④층
27. 오늘이 □□ 이에요? (What date is it today?)
①묘칠 ②모칠 ③머칠 ④며칠
28. 생일 □□합니다. (Happy birthday.)
①척하 ②촉하 ③축하 ④쳑하
29. □□합니다. (Excuse me.)
①실래 ②실례 ③실레 ④실래
30. □□에 있어요. (It's in the classroom.)
①교실 ②고실 ③거실 ④겨실

Appendix 4

Orthographic awareness tasks for KC1 learners

※ Choose the most appropriate spelling and mark it on this paper.

◈ Initial consonants

1. □□□에 살아요. (I live in a dormitory.)
①기숙사 ②지숙사 ③기죽사 ④치숙사
2. □□가 뭐예요? (What is your hobby?)
①쮜미 ②쥐미 ③취미 ④쉬미
3. □□□ 만나요. (See you later.)
①이따가 ②이다가 ③이타가 ④이빠가
4. □□를 했어요. (I had a party.)
①바티 ②바띠 ③파티 ④파띠
5. □□를 만났어요. (I met a friend.)
①진구 ②진쿠 ③친꾸 ④친구
6. □□□를 타고 싶어요. (I would like to ride a bike.)
①자선거 ②차전거 ③사전거 ④자전거
7. 음악□□ (Enjoy listening to music)
①감장 ②잠창 ③감상 ④잠상
8. □□□에 갈까요? (Shall we go to a department store?)
①팩화점 ②팩와점 ③백와점 ④백화점
9. □□ (Cleaning up)
①청조 ②청소 ③정조 ④정소
10. □□ (Basketball)
①몽구 ②동구 ③농구 ④롱구

◈ Final consonants

11. □□□□. (It's OK / It's all right.)
①괭찬아요 ②괭찮아요 ③괜찮아요 ④괜찷아요
12. 만나서 □□□□□. (Nice to meet you.)
①방갑습니다 ②방갑슴니다 ③반갑슴니다 ④반갑습니다
13. □□□□ (I like it.)
①종아해요 ②좋아해요 ③조아해요 ④좀아해요
14. □□ 갈까요? (Shall we go together?)
①같이 ②갇이 ③갓이 ④갗이
15. 사고 □□□. (I would like to buy.)
①십어요 ②싶어요 ③싵어요 ④심어요

16. □ 시에 만날까요? (What time shall we meet?)
①몃 ②멷 ③몇 ④멹
17. 학교 □에서 만나요. (See you in front of the school.)
①앞 ②압 ③암 ④앝
18. 재미있□□□. (It was fun.)
①었어요 ②얻어요 ③엇어요 ④엋어요
19. □□에 뭐 했어요? (What did you do over the weekend?)
①주만 ②주말 ③주맏 ④주맘
20. □□을 했어요. (I climbed a mountain.)
①등살 ②등산 ③듬산 ④듬살

◆ **Vowels**

21. 안녕히 □□□. (Good bye.)
①계서요 ②계세요 ③게서요 ④게세요
22. □□이 어떻게 되세요? (What is your name?)
①송함 ②승함 ③셩함 ④성함
23. □□해요. (I am sorry.)
①지송 ②죄송 ③줴송 ④좨송
24. 저는 □□에서 왔어요. (I came from Japan.)
①일븐 ②일번 ③일분 ④일본
25. 이 사람은 누구□□? (Who is this person?)
①얘요 ②여요 ③예요 ④에요
26. □은 뉴욕에 있어요. (My brother is in New York.)
①횽 ②형 ③헝 ④횽
27. □□□□ (Badminton)
①베드민턴 ②베드민톤 ③배드민턴 ④배드민톤
28. □□□ (Cellphone)
①휴대폰 ②후대폰 ③효대폰 ④호대폰
29. □□□ (Cosmetics)
①훠장품 ②훠장폼 ③화쟝품 ④화장품
30. □□ (Soccer)
①축구 ②축고 ③촉구 ④촉고

Appendix 5

The rubric of pronunciation assessment (a five-point scoring system)

	1 point	2 points	3 points	4 points	5 points
Accuracy	The articulation is very inaccurate, making it difficult to communicate.	The articulation often interferes with communication.	There are cases that which the articulation is inaccurate, which sometimes affects communication.	The articulation is generally clear and accurate, so it does not affect communication.	The articulation is very clear and accurate.
Fluency	Communication is difficult due to the very unnatural flow of utterances.	The flow of utterance is unnatural, which interferes with communication.	The flow of utterance is somewhat unnatural and sometimes affects communication.	The flow of utterances is generally natural and does not affect communication.	The flow of utterances is very natural without improper pause or hesitation.
Intonation	Intonation is very unnatural, making it difficult to communicate.	Intonation is unnatural, which interferes with communication.	Intonation is sometimes unnatural, so it sometimes affects communication.	Intonation is generally natural and does not affect communication.	Intonation is very natural.

Chun-Ye Kim
Lecturer
Department of General Education
School of Liberal Arts, Mae Fah Luang University
333, Moo 1, T. Thasud, A. Muang,
Chiang Rai, 57100 Thailand
E-mail: chunye.kim@mfu.ac.th

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