THE JOURNAL OF ASIA TEFL
Vol. 18, No. 4, Winter 2021, 1324-1346
http://dx.doi.org/10.18823/asiatefl.2021.18.4.15.1324

The Journal of Asia TEFL

http://journal.asiatefl.org/

e-ISSN 2466-1511 © 2004 AsiaTEFL.org. All rights reserved.

Distinct L2 Reading-Related Subgroups of Korean EFL First-year High School Learners: Latent Profile Analysis

Hyunsoon Kim
Seoul National University, South Korea

Byungmin Lee
Seoul National University, South Korea

This study identified the latent profiles of L2 reading skills that characterize EFL first-year high school learners in Korea to examine the nature of the L2 reading ability development in the Simple View of Reading (SVR) framework. Participants included 254 Korean-speaking high school students in mid- or low-income urban areas of Seoul and Gyeonggi Province. Decoding, linguistic comprehension, and reading comprehension skills were assessed by six measures in total at the beginning of the school year. Latent profile analysis (LPA) on the six reading-related measures identified three L2 reading skill profiles deviating by almost one SD each on every measure. The three groups showed distinctively stratified L2 reading abilities with close associations among the variables, providing support for the SVR model in EFL populations. Decoding measured by orthographic processing was the least distinguishing skill to infer group membership. The heterogeneity found among the same graded EFL learners is discussed in line with the frustration prevalent among underachieving English learners in Korean schools. Implications for instructions and future research are suggested.

Keywords: EFL, L2 reading, academic gap, simple view of reading, latent profile analysis

Introduction

The notion of providing education tailored to students' individual needs and profiles is central to the field of education, especially in the field of English in Korea suffering from severe academic disparity and achievement gaps. Although this gap in English ability has been targeted through various efforts such as after-school English classes, level-based English instruction, or adjusted level-based English learning materials (e.g., Kwon et al., 2020; Lim et al., 2018), fundamentally these levels or profiles are typically grounded on criteria such as school grades or nationwide English proficiency tests for this group of students. This is limited in assessing students' various components of L2 reading skills. Consequently, English education in schools and teacher's support have become less effective on individual learning (Baek, 2011; Kim, 2012; Lim et al., 2018; Lim & Joo, 2018). Since we have limited diagnostic and empirical knowledge on how well or poorly students perform in English and what are the sources of difficulties particularly low-achieving learners encounter, English education gives a way to less targeted interventions or materials, churning out so-called 'English Abandoners or Underachievers (Yeongpoja in Korean)' at a relatively early stage of English education (Byean, 2017; Shin & Lee, 2019; Yang, 2018; Yang, 2019). Conversely, extra-curricular learning outside school has become increasingly prevalent and

© 2021 AsiaTEFL All rights reserved

stood out as a main source of the individual differences or 'English Divide' in English learning (Lee, 2008; 2014; Shin & Lee, 2019). Thus, it is the individual students' parental socio-economic and educational backgrounds, and regions of residency that presumably determine the quantity and quality of private education of these adolescent students (Statistics Korea, 2021).

The present study targets L2 reading-related skills among Korean EFL high school students because their English learning experiences are mediated by written input with scarce opportunities for spoken language (Lee, 2008). The investigation particularly focused on first-year high school learners who have just exited middle school. This is a transition period that requires more intense demands on academic support (Kwon et al., 2020). Moreover, since English education in high schools aims to improve L2 literacy skills including reading and writing (Korean Ministry of Education, 2015), it was considered as an appropriate time to diagnose these students' L2 reading abilities.

There is a plethora of research on the nature of L2 reading abilities in English language learners (hereafter ELLs[1]) at various dimensions with advanced statistical methods. Various studies attempt to develop independent models of estimating ELLs' reading comprehension and revealing the relationships with decoding and linguistic variables based on the model of Simple View of Reading, hereafter SVR (Cho et al., 2019; Lesaux et al., 2010; Pasquarella et al., 2012; Proctor et al., 2005). Several studies address the developmental trajectories of ELLs' reading ability based on longitudinal data (Farnia & Geva, 2013; Geva & Farnia, 2012; Gutierrez & Vanderwood, 2013; Mancilla-Martinez et al., 2011; Silverman et al., 2015; Zadeh et al., 2012). Recent studies seek to identify distinct profiles from various reading ability indicators (e.g., Lesaux & Kieffer, 2010; O'Connor et al., 2019). Compared to the reading abilities of ELLs, further research must be conducted to identify knowledge on EFL learners' reading abilities, with greater statistical rigor to obtain valid and stable representations. To commence the present study, we set out to specify the sources of reading comprehension difficulties of adolescent EFL learners based on SVR (Gough & Tunmer, 1986) as a theoretical model to examine L2 reading ability patterns characterizing these EFL readers.

Theoretical Background

Sources of L2 Reading Comprehension Difficulty via the SVR

The Simple View of Reading model (Gough & Tunmer, 1986; Hoover & Gough, 1990; Hoover & Tunmer, 1993), a widely recognized framework explaining reading abilities, defines reading comprehension (R) as a product of two main constructs: decoding (D) and linguistic comprehension (C). By using a simple formula (D x C = R), the authors propose that the reading comprehension ability is an interaction between the ability to accurately and fluently recognize the words in print and the ability of comprehending linguistic discourse (Gough & Tunmer, 1986; Hoover & Gough, 1990).

Decoding

Decoding in the SVR is originally defined as "knowledge of the spelling–sound correspondence rules of English" (Gough & Tunmer, 1986, p. 7). L1 studies widely maintained the belief supporting the strong relationship between decoding and reading comprehension (Fuchs et al., 2001; Stanley et al., 2018; Wang et al., 2019), highlighting the fluency instruction (Rasinski et al., 2012; Schwanenflugel & Knapp, 2015). In the ELL research, the effect of decoding was less prominent while the L2 reading is more limited by other variables including vocabulary or listening comprehension or both (Lesaux & Kieffer, 2010; Lesaux et al., 2010; Li et al., 2021; Spencer & Wagner, 2017). It has also been observed that decoding ability

[1] English language learners in this study particularly refer to those who have different L1 backgrounds and learn to read in English in English-speaking countries. In this study, ELLs differ from EFL learners in that EFL learners have limited exposure to English such as Korean students learning English in Korea.

© 2021 AsiaTEFL All rights reserved

uniquely constituted a common proficiency with vocabulary knowledge in the early stage of L2 reading development (Pasquarella et al., 2012). In the EFL research, a group of researchers claimed that decoding was a strong contributor to L2 reading comprehension abilities (Jean, 2012; Jiang et al., 2012; Pretorious & Spaull, 2016). One notable finding on L2 decoding is that there was less variability in the accuracy of decoding abilities even among less proficient EFL learners although substantial variability was present in the aspect of fluency (Ryu & Lee, 2021). Another group of EFL researchers suggested that linguistic comprehension indicated by vocabulary or syntax was a more critical factor influencing L2 reading comprehension (Kang, 2020; Van Gelderen et al., 2004).

Orthographic decoding was shown to have implications in L2 reading comprehension (e.g., Bae, 2016; Haynes, 1989; Nassaji & Geva, 1999; O'Connor et al., 2019). Nassaji & Geva (1999) sought to separate decoding into two skills (i.e., orthographic decoding and phonemic decoding) and revealed that the effect of orthographic decoding was more pronounced than phonemic decoding along with vocabulary and syntactic skills in reading comprehension of adult advanced English learners. However, the effect of orthographic decoding in L2 reading comprehension was less stable among Japanese average-level EFL learners (Shiotsu, 2009; Yamashita, 2013). The ability of 'decoding' written signals (non-words) into plausible sound units may have different effects in L2 reading comprehension depending on L1 backgrounds or L2 proficiency. This view was supported by a recent study suggesting that the decoding variable measured by non-word reading was similar between the low and the high-performing learners among Korean elementary school students (Kim & Lee, 2021). The inconsistent findings on the effect of orthographic decoding need further investigation by considering additional factors such as proficiency level, language learning contexts (ESL Vs. EFL), or statistical methods (using a single variable or multi-variables).

Linguistic comprehension

Linguistic comprehension in the SVR is defined as skills of "parsing, bridging, and discourse building" (Hoover & Gough, 1990, p. 128). This construct has been frequently measured by listening comprehension as a proxy for capturing these skills in L1 (Tunmer & Chapman, 2012). Recent studies, however, operationalized it with multiple variables including vocabulary, morphological knowledge, or syntactic skills (Cho et al., 2019; Farnia & Geva, 2013; Geva & Farnia, 2012; Gottardo et al., 2017; Kieffer et al., 2016; Proctor et al., 2005; Proctor et al., 2012; Silverman et al., 2015).

Vocabulary has been actively discussed as a major source of reading comprehension difficulties for ELLs or EFL learners (Cho et al., 2019; Farnia & Geva, 2013; Geva & Farina, 2012; Kang, 2020; Lesaux & Kieffer, 2010; Li et al., 2021; Proctor et al., 2005; Shibasaki et al., 2015; Van Gelderen et al., 2004). Proctor et al. (2005) estimated the direct effect of vocabulary knowledge on reading comprehension beyond listening comprehension. The robust effect of vocabulary beyond decoding was also modeled in the EFL data, although it was only in the case of vocabulary depth knowledge, not breadth (Kang, 2020). Among various critical variables on reading comprehension, significant differences between poor and average/good reader groups were found on vocabulary breadth measures not vocabulary depth, syntactic, and various non-L2 related cognitive measures (Li et al., 2021). General vocabulary knowledge in general domains consistently underperformed across the three latent groups of poor L2 readers (35th percentile below the national norm; Lesaux & Kieffer, 2010). Cho et al. (2019) proposed a mechanism of the influence of vocabulary for low-achieving ELLs, where vocabulary had strong paths to reading comprehension via word reading and listening comprehension. However, this was less influential for their L1 peers.

Morphological knowledge recently started to be discussed as a component of linguistic comprehension of the SVR along with related variables including vocabulary and/or syntactic skills. Some studies reported that it did not predict reading comprehension ability and the growth rate in both L1 and ELLs, suggesting a marginal effect of morphological knowledge (Proctor et al., 2012; Silverman et al., 2015). However, further studies extensively supported the unique role of morphological knowledge in the

© 2021 AsiaTEFL All rights reserved

reading comprehension of language learners beyond related variables including word reading, phonological awareness, vocabulary, syntax, or listening comprehension (Jeon, 2011; Kieffer & Lesaux, 2008; Kieffer & Lesaux, 2012; Kieffer et al., 2016; Zhang & Koda, 2013). Morphological knowledge was also indicated to be a significant predictor distinguishing poor from average/good ELL subgroups beyond syntactic skills (D'Angelo & Chen, 2017; Li et al., 2021). Morphological knowledge can be strongly associated with vocabulary for language learners because the effect on reading comprehension is partially mediated by vocabulary knowledge (Gottardo et al., 2017; Zhang & Lin, 2021).

Syntactic parsing skills in the SVR have been mainly discussed in the field of L2 reading. In the comparison between L1 and ELL's reading ability development, the ELLs' reading comprehension growth substantially depends on syntactic knowledge (Farnia & Geva, 2013; Geva & Farnia, 2012). However, syntactic variables did not differ between poor, average, and good ELLs in some studies (D'Angelo & Chen, 2017; Li et al., 2021). Syntactic skills demonstrated diverging effects in EFL studies. Shiotsu and Weir (2007) found a robust effect of syntactic skills in adult proficient EFL learners without confounding effects yielded by learning contexts (EFL vs. ESL) and English proficiency. Kim and Cho (2015) yielded a nuanced result in that syntactic skill predicted better reading comprehension of intermediate-level learners, whereas vocabulary was a better predictor of reading comprehension for higher-level learners. Van Gelderen et al. (2004) and Shibasaki et al.'s (2015) data indicated weak or non-significant effects of syntactic variables when vocabulary or working memory variables was accounted for. Despite the inconsistent findings on the role of syntactic knowledge, it requires inclusion as a variable of linguistic comprehension of EFLs because one of the critical differences between the L1 and language learners is considered the quantity and quality of syntactic knowledge. This affects the ways of L2 reading until the advanced level (Grabe, 2009).

Profiling Studies of Reading Comprehension Abilities

Although various theories alongside the SVR have identified universals of reading comprehension and general trajectories of reading comprehension development, pedagogic demands are prevalent in profiling students' reading comprehension skills and locating the source of reading difficulties (Clemens et al., 2017; D'Angelo & Chen, 2017; Foorman et al., 2017; Lesaux & Kieffer, 2010; Li et al., 2021; O'Connor et al., 2019; Wolff, 2010). A number of studies compared the sources of reading comprehension difficulties between L1s and ELLs and examined particular pedagogic support required for the students identified as poor readers (D'Angelo & Chen, 2017; Li et al., 2021). These studies used regression techniques to identify different proficiency levels with a sample size of 124 and 145 each. However, the single measure cut scores can yield unstable classification because they allow for small changes in scores to cause shifting group membership (Foorman et al., 2017) and the sample size is considered too small to allow for more generalized inferences. Generating person-based profiles based on multiple variables facilitates a comprehensive description on the target population and maximizes the reliability and stability of classification (Samuelsen & Raczynski, 2013). Latent Class/Profile Analysis (LCA/LPA) has been employed in studies that seek to identify interpretable latent group membership among a target population (e.g., Clemens et al., 2017; Foorman et al., 2017; Lesaux & Kieffer, 2010; O'Connor et al., 2019; Wolff, 2010).

In the L1 reading domain, Foorman et al. (2017) discovered developmental patterns in their classifications of learners from kindergarten to secondary school students. There were five to six latent profiles in the elementary school students and the performance patterns were varied on word recognition, vocabulary, and syntactic measures. However, this heterogeneity was found to be reduced to three latent profiles in the secondary school students and their performance patterns followed high-, mid-, and low-patterns on all the measures tested. Based on a data set of Swedish speaking L1 children from a large-scale international literacy test (PIRLS), Wolff (2010) also identified eight interpretable subgroups by different types of reading comprehension abilities. Students in the good reading profiles performed

© 2021 AsiaTEFL All rights reserved

homogeneously well on every measure while students in the low-achieving profiles indicated more heterogeneous performance patterns.

In the L2 reading, Lesaux and Kieffer (2010) identified three distinct latent groups among the struggling ELLs particularly sampled by a national norm in the U.S. The three identified profiles consistently had low levels of general vocabulary knowledge while there were significant variations on academic vocabulary and word- and passage-level decoding variables across the distinct groups. Notably, this profiling study revealed that there were two different types of 'word callers' among the poor ELL readers. Unlike the nuanced patterns found across struggling ELLs (Lesaux & Kieffer, 2010), general ELLs were identified with two contrasting latent profiles characterized as either good or poor performance on every measured skill (O'Connor et al., 2019). The poor comprehension group was consistently associated with the substantially low level of decoding-related skills (i.e., phonological awareness, orthographic processing) and language-related variables (i.e., vocabulary knowledge, listening comprehension) whereas the good comprehension group was consistently associated with the substantially high level of all the decoding- and language-related skills.

To the best of our knowledge, there is a dearth of research examining the number of existing reading ability profiles representing EFL learners and their respective interpretable patterns. Although level-based English classes have been introduced and implemented in the school setting, it remains limited in terms of how students could be potentially classified and characterized based on their specific L2 literacy skills. Consequently, we have a limited understanding of the performance of underachieving students, although they are attracting academic and practical attention in the current international context (e.g., Cho et al., 2019; Clemens et al., 2017; D'Angelo & Chen, 2017; Garrison-Fletcher et al., 2019; Lesaux & Kieffer, 2010; Li et al., 2021; Mancilla-Martinez et al., 2011; O'Connor et al., 2019). Although we have discovered the specific discriminating variables distinguishing struggling L2 readers from average L2 readers (Lee, 2018), the results could suggest a lack of reliability and stability since the classification by cut-off scores of a single measure is often vulnerable to measurement errors (Foorman et al., 2017). Kim and Lee (2021) offered a more precise and reliable description of reading ability profiles using the LPA procedure. They presented four interpretable latent groups among some Korean elementary school students. Based on their attempt of finding heterogeneity in the Korean EFL learners, even within the same grade, further studies should be conducted with a larger sample size and more precise descriptions of the profiles.

The present study aimed to explore the characteristics of L2 reading abilities in a sample of adolescent EFL learners who have recently finished the middle school curriculum in Korea. The L2 reading skills were operationalized into three constructs (decoding, linguistic comprehension, and reading comprehension) by the SVR (Gough & Tunmer, 1986; Hoover & Gough, 1990; Hoover & Tunmer, 1993). The three constructs were assessed by total six measures. The aim of this study was to identify the number of distinct L2 reading skill profiles among the same-grade level EFL learners. Furthermore, this study attempted to describe the distinct profiles of these learners on various L2 reading subcomponent skills. Thus, the following research questions were addressed in this study:

1. How many distinct L2 reading skill profiles exist in a sample of EFL first-year high school readers?
2. What are the characteristics of the subgroups with respect to the six L2 reading-related measures?

Methods

Participants

The data used for the present study were taken from the researchers' larger project examining the relationship among the linguistic and reading comprehension component skills in the EFL readers. Two

© 2021 AsiaTEFL All rights reserved

hundred and sixty-nine first-year high school students were recruited from two local high schools in urban areas, Seoul and Gyeonggi Province. According to the national statistics regarding educational resources and the housing and land cost (Korean Statistical Information Service, 2020), the two schools were located in mid- or low-income neighbourhoods (see Kim, 2015; Statistics, 2021). Of these 269 students, 254 cases were selected as a final sample excluding the incomplete data by the absence or unfaithful performance on any of the measures indicated by blank sheet, etc.

There were 183 students from a vocational high school (D) and 71 students from a general high school (G). Since the data were collected at the beginning of the school year, the different types of school curriculum would not affect students' English learning. Although individual-level English proficiency was unavailable, we could draw on relevant data from our personal survey on the language learning experiences following the rationale of Lee (2014). Table 1 summarizes their language learning experiences including English-speaking residency, attending English-medium kindergarten, and the presence of English books at home. Out of 254 students, two resided in English-speaking countries less than one year, and twelve participants attended so-called English-medium kindergartens. Roughly, 28.8% (n = 72) possessed English books at home, while the majority (71.2%) did not. This information suggests that the present participants appear to have a mid- or low-level English proficiency.

TABLE 1
English Learning Backgrounds by Participating Schools, D and G (n = 254)

Residency in English-speaking Countries			Attending English-medium Kindergarten			Presence of English Books at Home		
D	G	*N* (%)	D	G	Total (*n*)	D	G	Total (*n*)
2 (100)	0 (.)	2 (0.8)	8 (66.7)	4 (33.3)	12 (4.7)	41 (56.9)	31 (43.1)	72(28.8)
		254			254			250

Note. 4 cases are missing in this item of our personal survey.

Instruments

Decoding measures

Word reading fluency. While the typical measurement of decoding in the SVR is the oral performance of reading real or non-words, this study measured in silent modes (e.g., Kieffer et al., 2016; O'Connor et al., 2019; Proctor et al., 2005; Sabatini et al., 2013; Shiotsu, 2009; Van Gelderen et al., 2004; Yamashita, 2013; Zhang & Shulley, 2017). Word reading fluency was defined as the efficiency of the holistic processing of real words. In the present study, the Test of Silent Word Reading Fluency -2 (Mather et al., 2014a) was used with some adaptations including alterations of some unfamiliar words. The participants were given with rows of unrelated words of increasing difficulty with no spaces separating them (e.g., dolovemytwotreewhy) and required to draw lines between them as many words as they can for three minutes (e.g., do/love/my/two/tree/why). The administration and scoring scheme was maintained from the original battery (Mather et al., 2014b). This task has a strong internal consistency and a robust correlation with more conventional methods such as oral pseudo word reading and real word reading fluency (Mather et al., 2014a; Kim et al., 2012).

Orthographic processing. Orthographic decoding was defined as the ability of rapidly and accurately processing the English letter strings conforming to orthographic regularity. The orthographic regularity judgment task was employed to measure this skill (Yamashita, 2013). This instrument was designed to assess the ability to recognize conventional orthographic patterns of English and to judge their conformity. The words in this measure were all non-words, but half of them were orthographically plausible (e.g., rup) and the other half were orthographically implausible (e.g., qru). During the time restriction of two minutes, the participants were required to decide whether the letter string looks like a real word in English as quickly and accurately as possible. Scoring was undertaken dichotomously.

© 2021 AsiaTEFL All rights reserved

Language measures

Vocabulary knowledge. Updated Vocabulary Level Test (Webb et al., 2017) was adapted to assess vocabulary knowledge. Following the suggestion of Kremmel and Schmitt (2017), the present instrument included two 10 clusters at the 1,000 and 2,000 levels because the two basic levels are in pedagogical demands on the target population of the present study. At each cluster, the participants were asked to select three English words out of six choices to match the three explanations in Korean. They receive one point for correctly choosing a word. The total score was 60. Scoring was undertaken dichotomously.

Morphological knowledge. Morphological knowledge in this study is operationalized as knowing the structures of morphemic words (Carlisle, 1995; Lesaux & Kieffer, 2010; Zhang & Koda, 2013). This morphological knowledge was measured using an experimental task of word decomposition developed by the present researchers. The test items were developed based on previous studies (e.g., Carlisle, 1988; Mahony, 1994; Nagy et al., 2006) and consisted of inflectional and derivational morphemes. Among the 24 items, 2 were inflected words; 5 were prefix-derivational words; 17 were suffix-derivational words. In this 24-item task, students were given derived forms of the word and asked to identify root by drawing lines between the root and morphemes within the derived words (e.g., "teach/er"). The total score was 24. Scoring was undertaken dichotomously.

Syntactic knowledge. A subtest of CELF-4 (Semel et al., 2003) was used to measure the ability of understanding syntactic structures. While the stimuli were provided in an oral mode in the original task, the administration was altered to be a written mode. The structures assessed include the future tense, present perfect, subjectless complement clause (e.g., to-infinitive), relative clauses, conjunctions, passive voice, negation, dative verb construction, direct request, subordination clause by adverbials. Although the original test has 26 items, the present study included only 21 items due to time constraints. The selection of the 21 items was based on the pedagogic needs and pilot data. The participants were required to read each sentence and choose the corresponding picture of each sentence among the four options. Scoring was undertaken dichotomously.

Reading comprehension measure

English reading comprehension was assessed in two dimensions adjusted by length: sentence and passage reading comprehension. Sentence reading comprehension was adapted from the material used in Oh (2016). It had 20 sentences taken from second-grade middle school textbooks and students were required to judge whether the sentence makes sense or not. The passage reading comprehension measure was developed by the present researchers. Texts were selected taking into account the target population's proficiency level and content familiarity. The number of words of the passages is 99, 103, 141, and 156: The readability by the Flesh-Kincaid Grade level is 1, 2.6, 3.8, and 4.1 measured by Coh-matrix. Questions were directed to ask for a textually explicit and implicit understanding of the text. After piloting, 12 test items were selected on the four passages. The total score is 32 (20 from the sentence RC and 12 from the passage RC). Scoring was undertaken dichotomously.

Procedure

All measures were administered from March to May 2021 during the class hours of English, taking into account the academic schedules of the participating schools. The assessment took place in two sessions. After we obtained parental permission and student informed assent, the participants completed word reading fluency, orthographic processing, vocabulary knowledge, and reading comprehension measures in the first session lasting approximately 45 minutes; they also completed morphological and syntactic knowledge measures in the second session of the assessment, lasting approximately 20 minutes. The

© 2021 AsiaTEFL All rights reserved

administration was done by the first author and the class English teachers. The English teachers at these two schools were trained by the first author for an hour-long session. The training session focused on understanding how to run each measure and practicing in pairs if needed. To maintain consistency of the administration, the procedures including the order of assessments and the instructions and demonstrations for each measure were scripted as a protocol. Strict time constraints were given to the decoding variables including word reading fluency and orthographic processing. All measures were administered in written modes.

Statistical Analysis

Latent Profile Analysis (LPA) was used to identify the number of skill profiles of L2 reading abilities among the EFLs. LPA is a person-centered approach for identifying unobserved, latent class membership among large cases using multivariate data, especially continuous data (Samuelsen & Raczynski, 2013). An advantage of using LPA is that it permits more robust statistical inferences about heterogeneity in the population of interest focusing on personal characteristics, not variables. LPA shares a similar goal with cluster analysis as they both pursue classifying cases into mutually exclusive groups based on observed variables. However, they differ in that unlike cluster analysis, LPA does not use assignment rules that can often be subjective or arbitrary (Nylund & Choi, 2018). LPA also requires relatively few assumptions such as normality or modest correlations among indicators (Cohan et al., 2008). We compared two-, three- and four–class models using Mplus (Muthen & Muthen, v8) to determine the best-fitting model for our data. After determining the most appropriate number of latent classes, we compared the six variable scores across the identified profile groups by using the analysis of variance (ANOVA) to corroborate the emerging distinct classes. Except for LPA, descriptive statistics and a series of analyses of variance were performed with SPSS (IMB, v25). All tests were two-tailed.

Results

Preliminary Analysis

Table 2 summarizes the descriptive statistics (total scores, means, standard deviations, and Cronbach α) and bivariate correlations among each variable. Based on the means and standard deviations of the variables, there was no ceiling effect on any of the variables. All of the variables were correlated moderately to strongly ($.447 \leq rs \leq .838$). The association between vocabulary knowledge and word reading fluency and between vocabulary knowledge and morphological knowledge were strong, $r = .838$ and $r = .804$, respectively. Although the coefficients of more than .80 often indicate multicollinearity, the variables were considered as separate indicators based on substantive theories and empirical evidence (Kieffer et al., 2016; Kim, 2017; Pasquarella et al., 2012; Gottardo et al., 2018). The reliabilities calculated by Cronbach α range from .79 to .96.

© 2021 AsiaTEFL All rights reserved

TABLE 2
Descriptive Statistics of Measures of WRF, Ortho, VK, MK, SK, and RC and Correlations among Them (n = 254)

	1. WRF	2. Ortho	3. VK	4. MK	5. SK	6. RC
1	-	.575**	.838**	.712**	.750**	.676**
2		-	.585**	.485**	.452**	.447**
3			-	.779**	.804**	.739**
4				-	.747**	.679**
5					-	.684**
Total	.	102	60	24	21	32
M (SD)	60.53	62.96	37.08	16.36	13.33	19.24
	(28.59)	(20.28)	(14.36)	(5.45)	(4.18)	(5.46)
Cronbach α	.	.96	.96	.90	.79	.80

Note. WRF = Word reading fluency; Ortho = Orthographic processing; VK = Vocabulary knowledge; MK = Morphological knowledge; SK = Syntactic knowledge; RC = Reading comprehension, ** p <.01.

Identified Latent Classes

To address our first research question, we investigated whether/how many distinct classes could be profiled using LPA. Since all the variables used in the study had different total scores, their z-scores were used. We used six comparative fit indices to evaluate the optimal model: Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), adjusted BIC (aBIC), Lo-Mendell-Rubin (LMR) likelihood ratio test, the bootstrapped likelihood ratio test (BLRT), and Entropy (Geiser, 2013). The AIC, BIC, and aBIC were used to compare different counterpart models, with the lowest value of each indicator showing a best-fitting model. The specified model was also statistically compared with a model with one less class by LMR likelihood ratio test and BLRT. In these tests, significant p-values indicate that the current model is significantly better-fitted to the data than the model with one less class. Entropy assesses the quality of class assignment from LPA, with a priority value of more than .80 and close to 1.0 indicating a much clearer delineation between the classes. The selection of the best-fitting model was based on the smallest AIC, BIC, and aBIC; a significant LMR likelihood test and BLRT; higher entropy values; and mean posterior probabilities close to 1.0 values for each class (Cohan et al., 2008). Substantive theories were also used to determine the best-fitting model (Lubke & Muthen, 2005).

Table 3 provides the goodness-of-fit statistics for the two-, three-, and four-class models. The three types of models all provided a significantly better fit than a model with one less class indicated by the BLRT test. The two-class model was less representative of the present data in terms of substantially higher values of AIC, BIC, and aBIC than the three-class model. The four-class model had the smallest AIC, BIC, and aBIC and the addition of a fourth class produced a statistically significant improvement in model fit (Δ2times LL = 93.556, Δdf = 7, p LMR = .0159, p BLRT = .000). However, the one resulting class was difficult to provide a theoretically and practically distinct interpretation from the other three groups. The difference in the AIC, BIC, and aBIC values between the four-class and three-class models was considered minor and the entropy of the four-class is smaller than the three-class model. Moreover, the average latent class probabilities for most likely latent class membership were clearer in the three-class model than the four-class model (see Appendix A). Therefore, the three-class solution was chosen as an LPA model for the present data based on the goodness-of-fit statistics and substantive interest of the present study (Δ2times LL = 263.084, Δdf = 7, p LMR = .0003, p BLRT = .000). The results indicated that the three-class model is valid to represent the present data of EFLs' reading abilities.

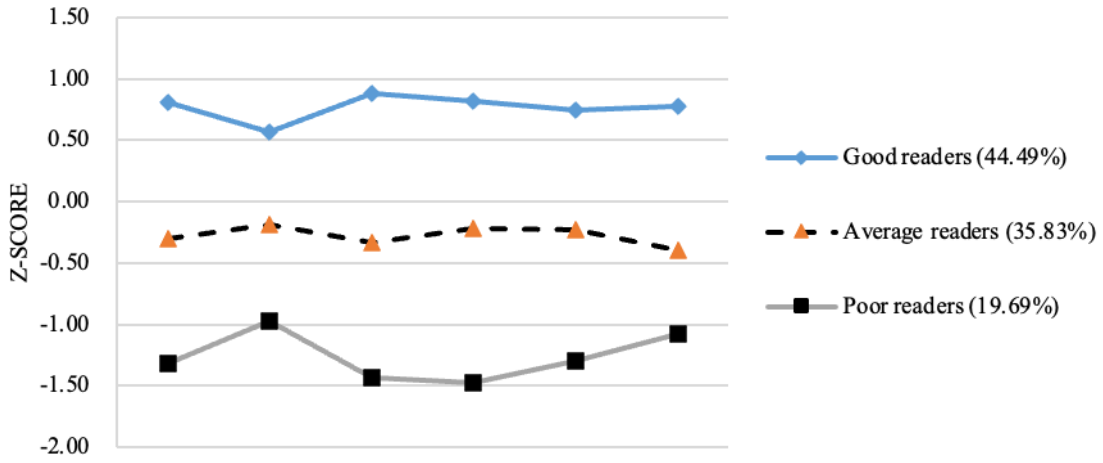
© 2021 AsiaTEFL All rights reserved

TABLE 3
Goodness-of-fit Statistics for Latent Profile Models Fitted to Diagnostic Data from Adolescent EFLs with Two, Three, and Four Classes

	Two Class	Three Class	Four Class
AIC	3513.431	3264.346	3184.790
BIC	3580.640	3356.317	3301.522
aBIC	3520.406	3273.892	3196.905
Entropy	0.925	0.921	0.870
Log-likelihood	-1737.715	-1606.173	-1559.395
2Times LL difference	843.482	263.084	93.556
LMR	p <. 001	p <. 001	p = .016
BLRT	p <. 001	p <. 001	p <. 001

Note. AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; aBIC = Sample-size Adjusted BIC; LMR = Lo-Mendell-Rubin Likelihood Ratio Test; BLRT = Bootstrapped Likelihood Ratio Test, <.001

The profiling patterns were illustrated with interpretative labels (see Figure 1). Of the total 254 participants, 44.49% of them (n = 113) were labeled as good readers and 35.83% (n = 91) were labeled as average readers. Finally, 19.69% (n = 50) were labeled as poor readers. According to Figure 1, each group shows distinct performance patterns on all L2 reading-related measures: word reading fluency, orthographic processing, vocabulary knowledge, morphological knowledge, syntactic knowledge, and reading comprehension.



Note. WRF = Word reading fluency; Ortho = Orthographic processing; VK = Vocabulary knowledge; MK = Morphological knowledge; SK = Syntactic knowledge; RC = Reading comprehension, <.001

Figure 1. Three profiles of Korean EFL high school readers based on the LPA (n = 254).

A series of ANOVAs were also conducted to validate the three identified subgroups (see Table 4). Raw scores were used in this analysis. The three groups statistically differed from each other on all measures: word reading fluency, orthographic processing, vocabulary, morphological knowledge, syntactic knowledge, and reading comprehension (p < .05). Post-hoc analyses by Bonferroni correction confirmed that the differences were present at every group comparison. The effect size varied from weak to strong (.350 ≤ η^2 ≤ .804). The group difference was the weakest on the orthographic processing (η^2 = .350), whereas the vocabulary knowledge recorded the largest group differences across the three groups (η^2 = .804). Overall, the results of ANOVAs validate the identified L2 reading ability profiles by LPA.

© 2021 AsiaTEFL All rights reserved

TABLE 4
Results of ANOVAs of the Six Measures by the Three Latent Groups and Post-hoc Comparisons (n = 254)

Measure (Total score)	PR (*n* = 50) *M* *(SD)*	AR (*n* = 91) *M* *(SD)*	GR (*n* = 113) *M* *(SD)*	*F*	η^2	Post-hoc Comparison
Decoding						
Word reading fluency	22.62 (15.20)	52.11 (15.54)	84.08 (17.41)	264.03*	.678	PR < AR < GR
Orthographic processing	43.10 (17.89)	59.32 (17.26)	74.68 (14.98)	67.69*	.350	″
Language						
Vocabulary Knowledge (60)	16.54 (7.04)	32.38 (6.81)	49.96 (5.68)	513.38*	.804	″
Morphological knowledge (24)	8.28 (3.34)	15.22 (3.04)	20.86 (2.01)	388.49*	.756	″
Syntactic Knowledge (21)	7.86 (2.84)	12.45 (2.99)	16.46 (2.22)	191.69*	.604	″
Reading comprehension (32)	13.22 (3.89)	17.18 (3.12)	23.58 (3.79)	168.23*	.573	″

Note. PR = poor readers; AR = average readers; GR = good readers, *$p < .05$.

The Characteristics of the Subgroups on the L2 Reading-related Skills

To address our second research question, the three groups were further examined to illustrate each group's characteristics with respect to L2 reading-related skills. According to Table 5, the good readers, 44.49% of them (*n* = 113), were almost 1 SD above the average readers on the majority of measures. The poor readers, 19.69% of them (*n* = 50), were 1–1.3 SD below the average readers, and 1.5–2.3 SD lower than the good readers. Furthermore, each group showed conspicuously distinct performances on almost all L2 reading-related measures, i.e., about 1 SD from each other respectively, although the difference in orthographic processing between the three groups is less than 1 SD. Of particular note, the poor readers had significantly lower scores than the upper two peer groups on every L2 reading subcomponent measure.

TABLE 5
Description of Each Skill Profile Found Among EFL Readers (n = 254)

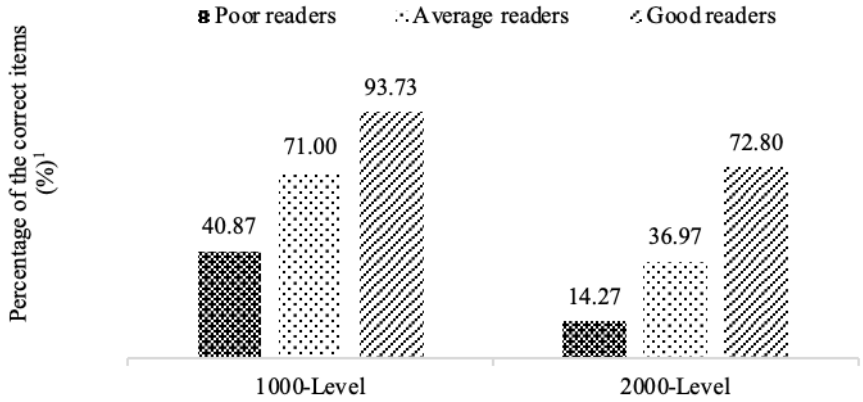
		Poor readers	Average readers	Good readers
Defining characteristics		1 to 1.3 *SD* below the average on all measures	Evenly around the average on all measures	Almost 1 *SD* above the average on most measures
Z-scores				
Decoding	WRF	-1.32	-0.30	0.81
	Ortho	-0.97	-0.19	0.57
Language	VK	-1.44	-0.33	0.88
	MK	-1.47	-0.22	0.81
	SK	-1.30	-0.23	0.74
Reading	RC	-1.08	-0.40	0.78
Proportions (%)		19.69	35.83	44.49
n classified		50	91	113

Note. WRF = Word reading fluency; Ortho = Orthographic processing; VK = Vocabulary knowledge; MK = Morphological knowledge; SK = Syntactic knowledge; RC = Reading comprehension

Additionally, the performance of each group on two linguistic measures (i.e., vocabulary and syntactic knowledge) was analyzed. As for vocabulary by each frequency level of the UVLT measure (Webb, et al., 2017), the percentage of correct items was calculated based on each profile group. In the order of PR, AR and GR, it was 40.87%, 71.00%, and 93.73% for the 1,000-level words. For the 2,000-level words, it was 14.27%, 36.97% and 72.80% (see Figure 2). In particular, the poor readers don't seem to have mastered

© 2021 AsiaTEFL All rights reserved

the 1,000-level words, although it is understood that these learners are unfamiliar with the majority of the 2,000-level words as well.



Note. 1. The percentages are calculated by this formula: PCA = the mean score / 30 (total scores) * 100

Figure 2. The percentages of the correct items at 1,000- and 2,000-Level of vocabulary among the Poor, Average and Good readers (*n* = 50, 91 & 113 respectively).

Intrigued by the substantially low correct rates among the poor readers on the 1,000- and 2,000-level words, we further investigated the least correct words among this subgroup. The ten least correctly answered words by each vocabulary level are as follows: *own, arrive, glance, rough, continue, consider, enter, empty, pull,* and *share*—in the order of low correct answer rates (.06 to .24)—for the 1,000-level list; *option, thief, storm, burst, various, desert, provide, improve, recognize* and *produce*—in the order of low correct answer rates (.00 to .04) —for the 2,000-level list.

As for the syntactic knowledge, three syntactic structures (i.e., the passive voice, dative verbs and relative clauses) were selected for further analysis because they are more frequently dealt with in English classes in Korea. Five items (i.e., items 2, 9, 10, 11, & 14) out of the 21 items were subsequently screened. The correct answer rates of these five items range from .08 to .44 for the poor readers; from .16 to .56 for the average readers and from .34 to .88 for the good readers. The most difficult item for each group was included among the five selected items. In the case of the passive voice structure, none of the three groups had correct answer rates of at least 50% or higher. Another noteworthy pattern was discovered in four items assessing coordinating and subordinating conjunctions (i.e., items 5, 7, 13, & 18). These items were the 12th, 5th, 8th, and 3rd most difficult for the poor readers; the 18th, 15th, 12th, and 6th most difficult for the average readers; and the 21st, 17th, 14th, and 10th most difficult for the good readers respectively. The sentence length with various conjunctions was more likely to cause difficulties for the poor readers compared to the other two upper groups (see Appendix B).

Discussion

EFL L2 Reading Skills Development

This study aimed to demonstrate heterogeneity and the degrees of proficiency in L2 reading abilities of the EFL first-year high school learners in average- or low-income urban areas in Korea. These 254 Korean EFL high school students received at least seven years of English education at schools. Our study identified three L2 reading profiles that were statistically and empirically distinct and the six L2-reading related measures provided precise yardsticks to differentiate these three subgroups. Of these first-year

© 2021 AsiaTEFL All rights reserved

high school students, 44.49% deviated by almost +1 SD above the average readers, and the lowest 20% of the students deviated from their peers by almost -1 SD to -2.3 SD.

The present L2 reading skill profiles have a pattern of low, medium, and high, shaping the distinctly stratified L2 reading abilities among the same grade-level participants. This finding supports the original conception of the SVR model that good reading comprehension results from the independent and interactive operation of both efficient decoding and high-quality language comprehension ability (Cho et al., 2019; Spencer & Wagner, 2017; Wagner et al., 2015). Accordingly, we expect that L2 readers with strong reading comprehension would perform well on the components in the SVR while L2 readers with poor reading comprehension ability would struggle with these subcomponent skills. In the present study, the profile with good reading comprehension had a solid command of all linguistic comprehension and decoding skills, whereas the poor readers have a similarly poor command of all these subcomponent L2 literacy skills. In contrast with the present finding, decoding and linguistic comprehension skills for ELL children had various developmental trajectories. Decoding was relatively well-developed even in the early stage of learning, while linguistic comprehension skills were the major sources of individual differences in reading abilities (Farnia & Geva, 2013; Geva & Farnia, 2012; Lesaux & Kieffer, 2010; Li et al., 2021; Proctor et al., 2005). Lesaux and Kieffer (2010), for example, revealed heterogeneity in the sources of reading difficulties by showing a group of automatic "word callers" with good decoding abilities but poor vocabulary. However, their study focused on low-achieving ELLs selected by a national norm. It can be understood that all reading-related subcomponent skills develop almost simultaneously at least for the present proficiency level of adolescent EFL readers, compared to L1 children or ELLs who are likely to have at least a certain level of linguistic comprehension skills when they begin to read. This interpretation was supported by Kim and Lee (2021)'s LPA on Korean EFL 6th grade elementary school students, showing the high, medium and low patterns on almost all L2 literacy-related measures except for the non-word decoding variable.

From the developmental perspective of L2 reading skills, EFL readers' learning tasks and developmental trajectory might be different from ELLs with a different language learning background (i.e., English-speaking context). These groups of L1 or L2 readers could develop spoken linguistic skills such as vocabulary or syntax preceding the literacy skills, possibly resulting in heterogeneous profiles among decoding and linguistic comprehension skills as represented in the young L1 learners (Foorman et al., 2017) or the ELLs (Lesaux & Kieffer, 2010). However, since the EFL readers tend to have limited opportunities of exposure to additional written and spoken English outside English classes at schools, it is difficult to expect differentiated developmental patterns in both word decoding and linguistic comprehension skills, especially for this level of EFL readers. Presumably, it is least likely to appear that the vocabulary ability is excellent, but the grammar ability is not excellent, or vice versa. This explanation aligns with a claim that decoding and vocabulary are uniquely interrelated at the initial stage of L2 reading development (Pasquarella et al., 2012). The present finding concludes that the EFLs' reading-related subcomponent skills are developing with close associations among themselves and advance in parallel across the different literacy and language skills.

Another intriguing finding is that the decoding variable indicated by orthographic processing was the least distinguishing skill of the three distinct groups. This skill was the least distinct area among the three distinct subgroups. In particular, the good readers showed the weakest performance on the orthographic processing although they performed relatively higher on the rest of the measured skills. One plausible explanation is that the weakest development of orthographic decoding skills results from the inefficiency of processing English orthography among EFL readers (Shiotsu, 2009; Yamashita, 2013). We cannot rule out the possibility that the present Korean EFL learners might have taken an advantage of their L1-specific alphabetic orthography (Korean, Hangeul), which was evidenced in some studies reporting the L1 background effects on decoding (Frost, 2005; Jiang, 2016; Wang & Koda, 2005). However, since English has deep orthography, it would require a considerable amount of exposure to English texts such that the English-specific deep orthography could be fully mastered (Seymour, 2005). This was substantiated in the profile of the good readers in this study, whose orthographic processing scores were

© 2021 AsiaTEFL All rights reserved

relatively lower than their other L2 literacy skills. Indeed, orthographic decoding is a significant predictor of L2 reading comprehension for advanced-level English learners (Haynes, 1989; Nassaji & Geva, 1999), while it shows a marginal effect in low-level EFL learners (Kim & Lee, 2021).

The present study found that all six measures representing the SVR components were sources of English reading difficulties across the three latent groups alike. Decoding was one of the critical sources of reading comprehension difficulties across the three groups, conforming to the previous literature supporting a unique and significant contribution of decoding ability for L2 reading comprehension of low-level learners (Pasquarella et al., 2012; Pretorius & Spaull, 2016). The finding that vocabulary, morphological knowledge, and syntactic knowledge were all significant indicators of the class membership aligns with previous conclusions that the three linguistic comprehension components have unique influences on the reading comprehension of various ELL populations (Cho et al., 2019; Farnia & Geva, 2013; Geva & Farnia, 2012; Gottardo et al., 2017; Kieffer et al., 2016; Li et al., 2021; Proctor et al., 2005).

In this study, approximately 20% of the newcomers to high school don't seem to have acquired basic English reading skills in almost all areas despite the seven years of school-based English education. The students in this group show lower than one or two standard deviations on average in every L2 reading-related skill compared to the students in the highest group and the median group. In previous studies (e.g., Ahn & Lee, 2020; Byean, 2015; Byean, 2017; Yang, 2018; Yang, 2019), English abandoners are found to be present at an early stage of English education and account for a significant proportion, which was empirically represented in this study. Although they have been taught English at school for almost seven years, the results suggest that they neither master the basic 1,000 vocabulary list nor have basic skills in processing grammatical structures along with other areas. It may be appropriate to say that these students abandon their opportunities to learn English at school due to the high level of English instruction and their apparent frustration and loss of confidence or self-efficacy in acquiring L2 reading skills inside and outside the classroom (Ahn & Lee, 2020; Baek, 2011; Jung, 2000; Kim, 2012; Yang, 2018; Yang, 2019).

The performance of the average and good readers in this study also insinuates the need for future improvement. Referring to the widely accepted value of the 98% coverage for adequate comprehension of written texts (Hsueh-Chao & Nation, 2000; Nation, 2006), many researchers estimate that 6,000-level vocabulary size—or greater—is required to undertake the college entrance exam (i.e., Korean CSAT) while the national curriculum by high school covers approximately 76% of the running words in CSAT (Kim & Lee, 2017; Lee, 2020; Year, 2018). If the good readers of this study aim to enter college, the 72.80% mastery of the 2,000-level words is still considered impoverished, and at least more than 4,000 words remain to be learned. It appears highly implausible to learn this number of new words within two years without a substantial amount of time and effort (Kim & Lee, 2017; Lee, 2020; Year, 2018).

Conclusions

This study reveals that there exist three distinct L2 reading proficiency groups among the first-year EFL high school students despite the seven-year formal English education at schools in Korea. The three groups are substantially different in L2 reading abilities. Speaking from the SVR perspectives, the decoding ability and linguistic comprehension skills indicated by vocabulary, morphological, and syntactic knowledge significantly differ by their group membership and the reading component skills are developing with close associations among themselves yielding high-, mid-, and low-profiles among all the measures. Nevertheless, orthographic decoding was a less distinguishing component for the three reading ability profiles at least for the present population of Korean EFL first-year high school learners.

The findings of the present study can provide pedagogical implications. First, although some EFL learners display an advantage with orthographic processing at an early stage of L2 reading development, this does not infer that they have good decoding skills. Orthographic decoding skills appear to remain limited and underdeveloped even among relatively good L2 readers.

© 2021 AsiaTEFL All rights reserved

Second, the presence of the salient profile differences provides strong rationales on student-centered, individualized interventions and materials in secondary school English classrooms in Korea. Low-achieving EFL learners would benefit from explicit and systematic vocabulary instruction before beginning to read more extended texts. It is known that the first 1,000-level words with extra proper nouns cover 78-81% of every written text (Nation, 2006) and 84.98% of children's literature of English (Macalister & Webb, 2019), calling for substantive attention on the mastery of this basic vocabulary.

On the other hand, we need to spare attention for the good readers group as well. Since the present latent profile analysis was built based upon the norm of the present participants, the good readers in the present study may not represent proficient L2 readers at the national level. Although they are entitled "good readers" in this study, they still seem to have a long way to go before they can read any text comfortably in English. For several decades, middle and high school English classes at least in Korea have scarcely incorporated instructions where students can repeatedly apply syntactic and lexical knowledge in meaningful reading contexts once these linguistic skills are introduced in the curriculum. By engaging in activities such as repeated or extensive reading (Nakanishi, 2015; Taguchi et al., 2016; Yamashita, 2015), students can extend opportunities to meaningfully encounter and incorporate familiar vocabulary and syntactic structures into their L2 literacy skills. Of course, a careful approach is required because untargeted extensive reading can overwhelm low-level EFL students (Lee et al., 2015).

The present study with the Korean first-year high school students effectively indicates that a significant heterogeneity exists even among the same grade-level EFL learners within a school. Conversely, the less diversity in the participants became a limitation for identifying more comprehensive representations of L2 reading ability profiles among the Korean EFL adolescent students. Since there is no national comparative reference data for these groups of students and the national norm, it is necessary to examine more diverse groups of students across the country to examine their English achievement and aid students and teachers in navigating their learning and pedagogical experiences. Despite the limitation in showing the comparison of the national norm, it is important to show the heterogeneity of the EFL adolescent students and their detailed L2 reading skill profiles using a more advanced statistical method such as LPA.

Acknowledgements

The authors wish to thank the students and their teachers in the two anonymous schools for their cooperation and perseverance.

The Authors

Hyunsoon Kim is a doctoral candidate in Dept. of English Education of Seoul National University. Her current research interests cover components of L2 reading ability, assessment of L2 reading-related skills and literacy development.

Department of English Language Education
College of Education
Seoul National University
Seoul, 08826, Korea
Tel: +82 028807670
Email: malibu2012@snu.ac.kr

Byungmin Lee (corresponding author) is a professor in Dept. of English Language Education of Seoul National University. His current research interests cover foreign language learning and teaching, L2 literacy acquisition and development, English curriculum, and bilingual education policy.

© 2021 AsiaTEFL All rights reserved

Department of English Language Education
College of Education
Seoul National University
Seoul, 08826, Korea
Tel: +82 028807677
Email: bmlee@snu.ac.kr

References

Ahn, S.-H. G., & Lee, M. W. (2020). *English classes in slumber: Why Korean students sleep in language education.* Springer.

Bae, J. (2017). *Relationships between lower-level processing skills and reading comprehension of Korean EFL high school students* [Unpublished master's thesis]. Seoul National University.

Baek, B. (2011). Su-jun-byeol-i-dong-su yeob-ui hyo-gwa [Effects of low ability grouping and special supplemental instruction for self-efficacy of middle school underachievers]. *The Korea Educational Review, 17*(2), 47.

Byean, H. (2015). English, tracking, and neoliberalization of education in South Korea. *TESOL Quarterly, 49*(4), 867-882.

Byean, H. (2017). *Tracked identities, resistance, and cultural production of yeongpoja: Critical ethnography of tracked English classes in a Korean middle school* [Unpublished doctoral dissertation]. University of British Columbia.

Carlisle, J. (1995). Morphological awareness and early reading achievement. In L. B. Feldman (Ed.), *Morphological aspects of language processing* (pp. 189-209). Erlbaum.

Carlisle, J. F. (1988). Knowledge of derivational morphology and spelling ability in fourth, sixth, and eighth graders. *Applied Psycholinguistics, 9*(3), 247-266.

Cho, E., Capin, P., Roberts, G., Roberts, G. J., & Vaughn, S. (2019). Examining sources and mechanisms of reading comprehension difficulties: Comparing English learners and non-English learners within the simple view of reading. *Journal of educational psychology, 111*(6), 982-1000.

Clemens, N. H., Simmons, D., Simmons, L. E., Wang, H., & Kwok, O.-M. (2017). The prevalence of reading fluency and vocabulary difficulties among adolescents struggling with reading comprehension. *Journal of Psychoeducational Assessment, 35*(8), 785-798.

Cohan, S. L., Chavira, D. A., Shipon-Blum, E., Hitchcock, C., Roesch, S. C., & Stein, M. B. (2008). Refining the classification of children with selective mutism: A latent profile analysis. *Journal of Clinical Child & Adolescent Psychology, 37*(4), 770-784.

D'Angelo, N., & Chen, X. (2017). Language profiles of poor comprehenders in English and French. *Journal of Research in Reading, 40*(2), 153-168.

Farnia, F., & Geva, E. (2013). Growth and predictors of change in English language learners' reading comprehension. *Journal of Research in Reading, 36*(4), 389-421.

Foorman, B. R., Petscher, Y., Stanley, C., & Truckenmiller, A. (2017). Latent profiles of reading and language and their association with standardized reading outcomes in kindergarten through tenth grade. *Journal of Research on Educational Effectiveness, 10*(3), 619-645.

Frost, R. (2005). Orthographic systems and skilled word recognition processes in reading. In M. J. Snowling & C. Hulme (Eds.), *The science of reading* (pp. 272-295). Blackwell.

Fuchs, L. S., Fuchs, D., Hosp, M. K., & Jenkins, J. R. (2001). Oral reading fluency as an indicator of reading competence: A theoretical, empirical, and historical analysis. *Scientific Studies of Reading, 5*(3), 239-256.

Garrison-Fletcher, L., Martohardjono, G., & Chodorow, M. (2019). Impact of home language reading skills' on L2 reading comprehension: A study of newcomer emergent bilinguals. *International Journal of Bilingual Education and Bilingualism*, 1-14.

© 2021 AsiaTEFL All rights reserved

Grabe, W. (2009). Epilogue: Reflections on second language reading research and instruction. In Z. Han & N. J. Anderson (Eds.), *Second language reading research and instruction: Crossing the boundaries* (pp. 192-205). University of Michigan Press.

Geiser, C. (2013). *Data analysis with Mplus*. Guilford press.

Geva, E., & Farnia, F. (2012). Developmental changes in the nature of language proficiency and reading fluency paint a more complex view of reading comprehension in ELL and EL1. *Reading and Writing, 25*(8), 1819-1845.

Gottardo, A., Mirza, A., Koh, P. W., Ferreira, A., & Javier, C. (2017). Unpacking listening comprehension: The role of vocabulary, morphological awareness, and syntactic knowledge in reading comprehension. *Reading & Writing, 31*(8), 1741-1764.

Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education, 7*(1), 6-10.

Gutiérrez, G., & Vanderwood, M. L. (2013). A growth curve analysis of literacy performance among second-grade, Spanish-speaking, English-language learners. *School Psychology Review, 42*(1), 3-21.

Hoover, W. A., & Gough, P. B. (1990). The simple view of reading. *Reading and Writing, 2*(2), 127-160.

Hoover, W. A., & Tunmer, W. E. (1993). The components of reading. In G. B. Thompson, W. E. Tunmer, & T. Nicholson (Eds.), *Reading acquisition processes* (pp. 1-19). Multilingual Matters.

Haynes, M. E. (1989). *Individual differences in Chinese readers of English: Orthography and reading* [Unpublished doctoral dissertation]. Michigan State University.

Jeon, E. H. (2011). Contribution of morphological awareness to second-language reading comprehension. *The Modern Language Journal, 95*(2), 217-235.

Jeon, E. H. (2012). Oral reading fluency in second language reading. *Reading in a Foreign Language, 24*(2), 186-208.

Jiang, X., Sawaki, Y., & Sabatini, J. (2012). Word reading efficiency, text reading fluency, and reading comprehension among Chinese learners of English. *Reading Psychology, 33*(4), 323-349.

Jiang, X. (2016). The role of oral reading fluency in ESL reading comprehension among learners of different first language backgrounds. *Reading Matrix: An International Online Journal, 16*(2), 227-242.

Jung, M. (2000). Su-jun-byeal-i-dong-su-eob-gwa gyo-yuk-gi-hwae-ui pyeong-deung-hwa-mun-jae [Ability grouping and equity of educational opportunity]. *Journal of Curriculum Studies, 18*(1), 275-297.

Kang, Y. (2020). Relative contribution of reading fluency and vocabulary knowledge in predicting Korean EFL learners' reading comprehension. *The Journal of Asia TEFL, 17*(3), 778-790. http://dx.doi.org/10.18823/asiatefl.2020.17.3.2.778

Kieffer, M. J., & Lesaux, N. K. (2008). The role of derivational morphology in the reading comprehension of Spanish-speaking English language learners. *Reading and Writing, 21*(8), 783-804.

Kieffer, M. J., & Lesaux, N. K. (2012). Direct and indirect roles of morphological awareness in the English reading comprehension of native English, Spanish, Filipino, and Vietnamese speakers. *Language Learning, 62*(4), 1170-1204.

Kieffer, M. J., Petscher, Y., Proctor, C. P., & Silverman, R. D. (2016). Is the whole greater than the sum of its parts? Modeling the contributions of language comprehension skills to reading comprehension in the upper elementary grades. *Scientific Studies of Reading, 20*(6), 436-454.

Kim, E. J., & Lee, B. (2021). A latent profile analysis on English reading skills of Korean 6th graders in an elementary school. *Primary English Education, 27*(2), 75-93.

Kim, J. (2015). The relationship of English shadow education expense, academic achievement, and level of understanding in English class: A latent growth modeling approach. *Journal of the Korea English Education Society, 14*(2), 197-215.

Kim, J., & Lee, D. J. (2017). A corpus-based study on the use of vocabulary in high school English I·II textbooks, College Scholastic Ability Tests, and EBS materials. *The Journal of Linguistics Science, 80*, 51-74.

© 2021 AsiaTEFL All rights reserved

Kim, J. S., & Cho, Y. K. (2015). Proficiency effects on relative roles of vocabulary and grammar knowledge in second language reading. *English Teaching, 70*(1), 75-96.

Kim, Y.-J. (2012). Implementing ability grouping in EFL contexts: Perceptions of teachers and students. *Language Teaching Research, 16*(3), 289-315.

Kim, Y.-S., Wagner, R. K., & Lopez, D. (2012). Developmental relations between reading fluency and reading comprehension: A longitudinal study from Grade 1 to Grade 2. *Journal of Experimental Child Psychology, 113*(1), 93-111.

Kim, Y.-S. (2017). Why the simple view of reading is not simplistic: Unpacking component skills of reading using a direct and indirect effect model of reading (DIER). *Scientific Studies of Reading, 21*(4), 310-333.

Kremmel, B., & Schmitt, N. (2017). Vocabulary levels test. In J. I. Liontas & T. I. Association (Eds.), *The TESOL encyclopedia of English language teaching* (Vol. 3, pp. 1-7). Wiley-Blackwell.

Korean Ministry of Education (2015). *Yeong-oe-gwa gyo-uek-gwa-jung* [2015 Revised National English Curriculum]. Retrieved Aug 19, 2021, from https://www.edunet.net/nedu/ncicsvc/listSub2015Form.do?menu_id=623

Korean Statistical Information Service (2020). E-jibang ji-pyo [eLocal Statistics]. Retrieved Dec 2, 2021, from https://kosis.kr/statisticsList/statisticsListIndex.do?vwcd=MT_GTITLE01&menuId=M_0 1_03_01

Kwon, E., Kim, J., Kim, M., Kim, J., & Han, G. (2020). *Jung-go-deung-hag-gyo jeon-hwan-gi hag-saeng ji-won jeon-lyag ye-si-ja-lyo* [Example material for supporting students in the transition period of middle and high school]. Retrieved Aug 19, 2021, from https://www.kice.re.kr/resrchBoard/view.do?seq=714&s=kice&m=030109

Hsueh-Chao, M. H., & Nation, P. (2000). Unknown vocabulary density and reading comprehension. *Reading in a Foreign Language*, *13*(1), 403-430.

Lee, B. (2008). College students' experiences of exposure to spoken English: Focusing on the amount of exposure time and types. *English Teaching, 63*(4), 349-370.

Lee, B. (2014). *Oedangsineyeongeonunsilpaehanunga* [Why English fails you: The meaning of learning English in South Korea]. Wooriehakgyo.

Lee, H. (2020). Vocabulary analysis of CSAT English tests and CSAT-EBS preparation coursebooks, with reference to the reading tests. *Modern English Education, 21*(3), 48-57.

Lee, J., Schallert, D. L., & Kim, E. (2015). Effects of extensive reading and translation activities on grammar knowledge and attitudes for EFL adolescents. *System, 52*, 38-50.

Lee, Y.-A. (2018). Examining what distinguishes poor readers from average readers in elementary school English. *Primary English Education, 24*, 5-30.

Lim, E., & Joo, Y. (2018). Determining structural relationships among factors influencing adolescents' English academic achievement. *Journal of Research in Curriculum & Instruction, 22*(2), 113-125.

Lim, E., Park, I.-Y., Jung, H., Seo, M., Kim, W., & Han, J.-A. (2018). The factors affecting high school students' achievement and achievement gap based on 2016 NAEA results. *Journal of Educational Evaluation, 31*(1), 125-153.

Lesaux, N. K., Crosson, A. C., Kieffer, M. J., & Pierce, M. (2010). Uneven profiles: Language minority learners' word reading, vocabulary, and reading comprehension skills. *Journal of Applied Developmental Psychology, 31*(6), 475-483.

Lesaux, N. K., & Kieffer, M. J. (2010). Exploring sources of reading comprehension difficulties among language minority learners and their classmates in early adolescence. *American Educational Research Journal, 47*(3), 596-632.

Li, M., Geva, E., D'Angelo, N., Koh, P. W., Chen, X., & Gottardo, A. (2021). Exploring sources of poor reading comprehension in English language learners. *Annals of Dyslexia*, 1-23.

Lubke, G. H., & Muthén, B. (2005). Investigating population heterogeneity with factor mixture models. *Psychological Methods, 10*(1), 21.

Macalister, J., & Webb, S. (2019). Can L1 children's literature be used in the English language classroom? High frequency words in writing for children. *Reading in a Foreign Language, 31*(1), 62-80.

© 2021 AsiaTEFL All rights reserved

Mahony, D. L. (1994). Using sensitivity to word structure to explain variance in high school and college level reading ability. *Reading and Writing, 6*(1), 19-44.

Mancilla-Martinez, J., Kieffer, M. J., Biancarosa, G., Christodoulou, J. A., & Snow, C. E. (2011). Investigating English reading comprehension growth in adolescent language minority learners: Some insights from the simple view. *Reading and Writing, 24*(3), 339-354.

Mather, N., Hammill, D., Allen, E., & Roberts, R. (2014a). *Test of Silent Word Reading Fluency-2*. PRO-ED.

Mather, N., Hammill, D., Allen, E., & Roberts, R. (2014b). *Test of Silent Word Reading Fluency-2 Examiner's Manual*. PRO-ED.

Nagy, W., Berninger, V. W., & Abbott, R. D. (2006). Contributions of morphology beyond phonology to literacy outcomes of upper elementary and middle-school students. *Journal of educational psychology, 98*(1), 134.

Nakanishi, T. (2015). A meta-analysis of extensive reading research. *TESOL Quarterly, 49*(1), 6-37.

Nassaji, H., & Geva, E. (1999). The contribution of phonological and orthographic processing skills to adult ESL reading: Evidence from native speakers of Farsi. *Applied Psycholinguistics, 20*(2), 241-267.

Nation, I. (2006). How large a vocabulary is needed for reading and listening? *Canadian Modern Language Review, 63*(1), 59-82.

Nylund-Gibson, K., & Choi, A. Y. (2018). Ten frequently asked questions about latent class analysis. *Translational Issues in Psychological Science, 4*(4), 440.

O'Connor, M., Geva, E., & Koh, P. W. (2019). Examining reading comprehension profiles of grade 5 monolinguals and English language learners through the lexical quality hypothesis lens. *Journal of Learning Disabilities, 52*(3), 232-246.

Oh, E. (2016). Comparative studies on the roles of linguistic knowledge and sentence processing speed in L2 listening and reading comprehension in an EFL tertiary setting. *Reading Psychology, 37*(2), 257-285.

Pasquarella, A., Gottardo, A., & Grant, A. (2012). Comparing factors related to reading comprehension in adolescents who speak English as a first (L1) or second (L2) language. *Scientific Studies of Reading, 16*(6), 475-503.

Pretorius, E. J., & Spaull, N. (2016). Exploring relationships between oral reading fluency and reading comprehension amongst English second language readers in South Africa. *Reading and Writing, 29*(7), 1449-1471.

Proctor, C. P., Carlo, M., August, D., & Snow, C. (2005). Native Spanish-speaking children reading in English: Toward a model of comprehension. *Journal of Educational Psychology, 97*(2), 246.

Proctor, C. P., Silverman, R. D., Harring, J. R., & Montecillo, C. (2012). The role of vocabulary depth in predicting reading comprehension among English monolingual and Spanish-English bilingual children in elementary school. *Reading and Writing, 25*(7), 1635-1664.

Rasinski, T. V., Blachowicz, C. L., & Lems, K. (2012). *Fluency instruction: Research-based best practices*. Guilford Press.

Ryu, J., & Lee, B. (2021). Diagnosis of Korean EFL high school students' reading fluency using informal reading inventory. *The Journal of Asia TEFL, 18*(2), 489-504. http://dx.doi.org/10.18823/asiatefl.2021.18.2.7.489

Sabatini, J., Bruce, K., & Steinberg, J. (2013). *SARA reading components tests, RISE form: Test design and technical adequacy*. *ETS.* https://origin-www.ets.org/Media/Research/pdf/RR-13-08.pdf

Samuelsen, K., & Raczynski, K. (2013). Latent Class/Profile Analysis. In Y. Petscher, C. Schatschneider, & D. L. Compton (Eds.), *Applied quantitative analysis in education and the social science* (pp. 304-328). Routledge.

Schwanenflugel, P. J., & Knapp, N. F. (2015). Reading fluency. In P. Schwanenflugel & N. F. Knapp (Eds.), *The psychology of reading: Theory and applications* (Vol. 2, pp. 107-131). Guilford Publications.

Semel, E., Wig, E., & Secord, W. (2003). *Clinical evaluation of language fundamentals*. Psychological Corporation.

© 2021 AsiaTEFL All rights reserved

Seymour, P. H. (2005). Early reading development in European Orthographies. In M. J. Snowling & C. Hulme (Eds.), *The science of reading* (pp. 296-315). Blackwell.

Shibasaki, H., Tokimoto, S., Ono, Y., Inoue, T., & Tamaoka, K. (2015). English reading comprehension by Japanese high school students: Structural equation modeling including working memory and L1 literacy. *Open Journal of Modern Linguistics, 5*(05), 443-458.

Shin, H., & Lee, B. (2019). "English Divide" and ELT in Korea: Towards critical ELT policy and practices. In X. Gao (Ed.), *Second handbook of English language teaching* (pp. 73-90). Springer International Publishing.

Shiotsu, T. (2009). Reading ability and components of word recognition speed: The case of L1-Japanese EFL learners. In Z. Han & N. J. Anderson (Eds.), *Second language reading research and instruction: Crossing the boundaries* (pp. 15-39). University of Michigan Press.

Shiotsu, T., & Weir, C. J. (2007). The relative significance of syntactic knowledge and vocabulary breadth in the prediction of reading comprehension test performance. *Language Testing, 24*(1), 99-128.

Silverman, R. D., Proctor, C. P., Harring, J. R., Hartranft, A. M., Doyle, B., & Zelinke, S. B. (2015). Language skills and reading comprehension in English monolingual and Spanish-English bilingual children in grades 2-5. *Reading and Writing, 28*(9), 1381-1405.

Spencer, M., & Wagner, R. K. (2017). The comprehension problems for second-language learners with poor reading comprehension despite adequate decoding: A meta-analysis. *Journal of Research in Reading, 40*(2), 199-217.

Stanley, C. T., Petscher, Y., & Catts, H. (2018). A longitudinal investigation of direct and indirect links between reading skills in kindergarten and reading comprehension in tenth grade. *Reading and Writing, 31*(1), 133-153.

Statistics Korea (2021). Private Education Expenditures Survey in 2020. Retrieved Aug 19, 2021, fromhttp://kostat.go.kr/portal/eng/pressReleases/1/index.board?bmode=read&bSeq=&aSeq=389085&pageNo=7&rowNum=10&navCount=10&currPg=&searchInfo=&sTarget=title&sTxt=

Taguchi, E., Gorsuch, G., Lems, K., & Rosszell, R. (2016). Scaffolding in L2 reading: How repetition and an auditory model help readers. *Reading in a Foreign Language, 28*(1), 101-117.

Tunmer, W. E., & Chapman, J. W. (2012). The simple view of reading redux: Vocabulary knowledge and the independent components hypothesis. *Journal of Learning Disabilities, 45*(5), 453-466.

Van Gelderen, A., Schoonen, R., De Glopper, K., Hulstijn, J., Simis, A., Snellings, P., & Stevenson, M. (2004). Linguistic knowledge, processing speed, and metacognitive knowledge in rirst-and second-language reading comprehension: A componential analysis. *Journal of Educational Psychology, 96*(1), 19-30.

Wagner, R. K., Herrera, S. K., Spencer, M., & Quinn, J. M. (2015). Reconsidering the simple view of reading in an intriguing case of equivalent models: Commentary on Tunmer and Chapman (2012). *Journal of Learning Disabilities, 48*(2), 115-119.

Wang, M., & Koda, K. (2005). Commonalities and differences in word identification skills among learners of English as a second language. *Language Learning, 55*(1), 71-98.

Wang, Z., Sabatini, J., O'Reilly, T., & Weeks, J. (2019). Decoding and reading comprehension: A test of the decoding threshold hypothesis. *Journal of educational psychology, 111*(3), 387-401.

Webb, S., Sasao, Y., & Ballance, O. (2017). The updated Vocabulary Levels Test: Developing and validating two new forms of the VLT. *ITL-International Journal of Applied Linguistics, 168*(1), 33-69.

Wolff, U. (2010). Subgrouping of readers based on performance measures: A latent profile analysis. *Reading and Writing, 23*(2), 209-238.

Yamashita, J. (2013). Word recognition subcomponents and passage level reading in a foreign language. *Reading in a Foreign Language, 25*(1), 52-71.

Yamashita, J. (2015). In search of the nature of extensive reading in L2: Cognitive, affective, and pedagogical perspectives. *Reading in a Foreign Language, 27*(1), 168-181.

Yang, J. (2018). *English education and social reproduction: An ethnography of adolescents in a Korean public school* [Unpublished doctoral dissertation]. University of Toronto.

© 2021 AsiaTEFL All rights reserved

Yang, J. (2019). A school ethnography of "Yeongpoja": Focusing on English underachievers in a Korean middle school. *Studies in English Education, 24*(3), 419-442.

Year, J.-E. (2018). How much vocabulary is necessary for the English section of the College Scholastic Ability Test? *Journal of the Korea English Education Society, 17*(4), 47-72.

Zadeh, Z. Y., Farnia, F., & Geva, E. (2012). Toward modeling reading comprehension and reading fluency in English language learners. *Reading and Writing, 25*(1), 163-187.

Zhang, D., & Koda, K. (2013). Morphological awareness and reading comprehension in a foreign language: A study of young Chinese EFL learners. *System, 41*(4), 901-913.

Zhang, H., & Lin, J. (2021). Morphological knowledge in second language reading comprehension: Examining mediation through vocabulary knowledge and lexical inference. *Educational Psychology, 41*(5), 563-581.

Zhang, J., & Shulley, L. (2017). Poor comprehenders in English-only and English language learners: influence of morphological analysis during incidental word learning. *Journal of Research in Reading, 40*(2), 169-183.

(Received August 31, 2021; Revised November 20, 2021; Accepted December 18, 2021)

© 2021 AsiaTEFL All rights reserved

Appendix A

Average Latent Profile Probabilities for Most Likely Latent Class Membership (row) by Latent Class (column)

Model	*n*	1	3	-	2
Three-class					
Class 1	50	.960	.040	-	.000
Class 3	91	.020	.944	-	.036
Class 2	113	.000	.013	-	.987
Four-class	n	1	3	4	2
Class 1	43	.954	.046	.000	.000
Class 3	73	.014	.946	.040	.000
Class 4	70	.000	.031	.915	.053
Class 2	68	.000	.000	.096	.904

Note. Any of the magnitudes of the off-diagonal cells for latent classes in the three-class model were minimal (from .000 to .036), suggesting that the three profile groups were clearly distinguishable.

© 2021 AsiaTEFL All rights reserved

Appendix B

Correct Answer Rates and Ranking of Difficulties of Selected Items on Syntactic Knowledge Test by Three Profile Groups

Item number	Syntactic structures	Sentence	Poor readers (*n* = 50)		Average readers (*n* = 91)		Good readers (*n* = 113)	
			Rate[1]	Rank[2]	Rate	Rank	Rate	Rank
2	Relative clauses	The girl who is standing in the front of the line is wearing a backpack.	.08	1	.35	2	.73	7
9		The woman who is holding the baby dropped her purse.	.34	11	.56	10	.88	13
10	Dative	Mom showed the dog the cat.	.24	4	.56	9	.59	5
11	Passive voice	The girl is pushed by the boy.	.44	15	.16	1	.41	2
14		The boy is being followed by the dog.	.40	13	.38	4	.34	1
5	Conjunctions	She is climbing and he is swinging.	.36	12	.76	18	.98	21
7		The first two children are in line, but the third child is still playing.	.24	5	.71	15	.94	17
13		The girl is wearing her new raincoat, although she doesn't need it.	.26	8	.65	12	.92	14
18		The boy began gathering apples after they fell to the ground.	.20	3	.48	6	.86	10

Note.
1. Rate refers to correct answer rates calculated by this formula: Rate = the number of students who scored correctly/total number of each profile group
2. Rank is in the order of low correct answer rates. That is, the lower ranks indicate the more difficulties. The ranks range 1 to 21.

© 2021 AsiaTEFL All rights reserved