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Maternal literate mediation of writing and Korean children's reading and writing across 1 year

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Abstract The present study examined the relations of maternal literate support instructions during parent–child joint writing to children's word reading and writing across 1 year among 95 4- and 5-year-old children from Korea. The whole episode of mothers individually teaching their children how to write words was videotaped, and a Korean scale of mothers' literate mediation of their children's writing was developed based on six cognitive strategies focusing on whole Gulja (Korean written syllable), visual strokes, letter, Gulja structure, and CV (consonant + vowel) and coda (final consonant of a syllable) subsyllabic units. Maternal literate support explained a significant amount of variance in children's word reading and writing concurrently and longitudinally across 1 year after controlling for children's age, nonverbal IQ, phonological and morphological awareness, rapid automatized naming and mother's education. In addition, children's coda phoneme awareness explained unique variance in word reading and writing concurrently and longitudinally. Results underscore the unique characteristics of Korean and the importance of Korean maternal literate support as a major factor in early literacy development.

Keywords Maternal literate mediation · Korean · Hangul reading · Hangul writing · Coda awareness

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Introduction

The present study examined how Korean mothers might facilitate their children's reading and writing of Hangul by focusing on their literate mediation strategies for teaching writing. Despite Korean parents' strong support for early Hangul acquisition (Cho, Bae, Park, & Park, 2012; Kim, 2009), little is known about how Korean mothers support children's writing skill development. Recently, writing has been a focus as an effective tool for improving students' reading, including word recognition, reading fluency, and comprehension (see Graham & Hebert, 2011, for a review). Indeed, young children engage in writing at home and a variety of writing events as a part of parent–child interactions (Burns & Casbergue, 1992). Although writing is a part of many home environments, studies of the relationship between parent–child interactions and children's literacy have focused mainly on linguistic interactions and shared book reading but only in a limited way on young children's joint writing with parents.

Theoretical background for characterizing maternal literate mediation

According to the theory of zone of proximal development by Vygotsky (1978), children master and internalize higher mental functions by means of scaffolding, which is defined as assisted learning or mediated learning by skilled adults. In general, parents support and scaffold their child in difficult tasks and problems until the child acquires the skills to manage the task independently (e.g., Neitzel & Stright, 2003). In the process of scaffolding, parents adjust their level of support to fit the child's zone of proximal development. Parental scaffolding, complete with parent–child interactions, ultimately extends the child's knowledge, reduces task complexity, and enhances problem solving skills (Bruner, 1986; Neitzel & Stright, 2003). Neitzel and Stright (2003) examined cognitive dimensions of maternal scaffolding in the tasks of children's problem solving and their relations with children's academic self-regulatory behaviors in kindergarten. In their study, cognitive scaffolding was defined by the degree to which a mother provided specific task-related strategies and regulated task difficulty.

Cognitive scaffolding has been applied to the context of maternal mediation of teaching word writing and literacy development in Hebrew (Aram & Levin, 2001; 2004) and Chinese (Lin et al., 2009, 2012). In Chinese literacy mediation studies, cognitive scaffolding refers to mothers' specific encoding and decoding strategies to facilitate children's writing (Lin et al., 2009, 2012). Replicating the literacy mediation studies in Hebrew and Chinese (Lin et al., 2009, 2012), the present study investigated specific strategies of cognitive scaffolding and the typical level of strategies that Korean mothers use for teaching Hangul word writing to their children at home and examined relations of the typical level of strategies with children's reading and writing acquisition.

Korean Hangul acquisition

Hangul has unique features as an alphasyllabary (Taylor & Taylor, 2014). Hangul has 21 vowel (ㅏ, ㅐ, ㅑ, ㅒ, ㅓ, ㅔ, ㅕ, ㅖ, ㅗ, ㅘ, ㅙ, ㅚ, ㅛ, ㅜ, ㅝ, ㅞ, ㅟ, ㅠ, ㅡ, ㅢ, ㅣ) and 19 consonant (ㄱ, ㄲ, ㄴ, ㄷ, ㄸ, ㄹ, ㅁ, ㅂ, ㅃ, ㅅ, ㅆ, ㅇ, ㅈ, ㅉ, ㅊ, ㅋ, ㅌ, ㅍ, ㅎ) letters, each of which makes a sound, representing consistent grapheme-phoneme correspondences. Hangul letters are written systematically from top to bottom and from left to right to make a square block, or Gulja, to represent each Korean syllable. Structures of Gulja are rather simple, including CV (e.g., 사 /sa/ "four," 구 /ku/ "nine"), CVC (e.g., 삼 /sam/ "three," 국 /kuk/ "soup"), and CVCC (e.g., 닭 /dak/ "chicken") structures. Korean words consist of one Gulja (차 /ʧa/ "car"), two Guljas (주차 /ju ʧa/ "car parking") and more Guljas (자동차 /ja doŋ ʧa/ "automobile"). Korean syllables and Gulja are considered as important phonological and orthographic units of Korean languages (Cho & McBride-Chang, 2005; Simpson & Kang, 2004).

Korean children first learn written syllable blocks of Korean and then gradually learn to decompose these into letters with development and formal teaching in school. This approach appears to minimize the importance of individual letter name knowledge for earliest literacy acquisition in Korean but also makes initial learning of CV Gulja patterns of Korean essential for reading and writing development (e.g., Cho, 2009). Korean is also an interesting orthography to examine because of the unique focus of its learners on coda, rather than onset-rime phonological units (Yi, 1998; Yoon, Bolger, Kwon, & Perfetti, 2002). Coda sensitivity may, thus, be a critical element of early reading and writing acquisition (e.g., Cho, McBride-Chang, & Park, 2008; Kim, 2007).

Early Korean literacy learning has, thus far, centered primarily on cognitive correlates of Hangul word reading and writing. Phonological awareness, the ability to identify and manipulate speech sounds, has been one of the main such correlates investigated for kindergartners (e.g., Cho & McBride-Chang, 2005; Cho et al., 2008; Kim, 2007). As expected given the major characteristics of Hangul as an alphasyllabary, previous studies have demonstrated that both syllables and phonemes are important phonological units in Hangul reading (Cho & McBride-Chang, 2005). Perhaps for this reason, syllable awareness tends to be uniquely associated with Hangul reading and writing in young children in some studies as well (Cho & McBride-Chang, 2005; Cho et al., 2008). Indeed, Korean children typically learn to read beginning with CV syllables in their names and with high frequency words. Only later do children learn to divide these syllables into component letters. Importantly, coda awareness is an additional aspect of phonological awareness that is apparently more salient in Korean than in other languages because Korean children are more sensitive to coda subsyllabic unit than onset unit (e.g., Cho et al., 2008; Yoon et al., 2002).

Morphological awareness, the ability to manipulate and recognize morphemes, may be helpful in generalizing these morphemes to new words, facilitating early Hangul reading. Indeed, in Korean, compounding, derivational, and inflectional morphology are all rich and productive. In particular, about 70% of Korean

vocabulary words originated from Chinese (Taylor & Taylor, 2014). Thus, in Korean, many lexical compounds are semantically transparent and homophones are common as in Chinese. For example, the Korean native words for palm and sole can be literally translated as *hand bottom* (손바닥 /son ba dak/) and *foot bottom* (발바닥 /bal ba dak/). Because morphemes are often repeated across words in Korean and because some irregular words require some complicated derivational manipulations, morphological awareness is linked to reading in young Korean children in some studies (Cho et al., 2008; McBride-Chang et al., 2005; Wang, Ko, & Choi, 2009). We focused on this aspect of morphological awareness in the present study because lexical compounding may be a salient feature of the Korean language and, by extension, word recognition among very young children, as it is in other languages (e.g., McBride-Chang, Shu, Zhou, Wat, & Wagner, 2005).

Finally, the relation of rapid automatized naming, or RAN, with Hangul reading has not been consistent in previous studies, showing significant associations in some studies (Cho et al., 2008) and nonsignificant associations in several others (e.g., Cho & McBride-Chang, 2005). Different subskills underlie RAN tasks, such as phonological recoding of visual stimuli in lexical memory, visual sequencing, arbitrary symbol processing, and the use of word-specific orthographic information (Manis, Seidenberg & Doi, 1999; McBride, 2016 for a review; Wagner & Torgesen, 1987). The link between RAN and word reading may depend on the phonological regularity of the orthography and a person's literacy proficiency (Cho & Chiu, 2015; Moll & Landerl, 2009; Savage, Pillay & Melidona, 2008). In English, young children's RAN has also been linked to their word reading after controlling for phonological awareness, suggesting that RAN has nonphonological processing related to reading (Logan, Schatschneider & Wagner, 2011). Although grapheme-phoneme correspondences of Hangul are transparent at a syllable level, they are often inconsistent at the levels of word and phrase due to phonological changes such as resyllabification and assimilation phenomena of the Korean language. For example, a Korean word 같이 (/gat i/ "together") is pronounced to 가치 (/ga ʧi/ "value") due to the application of resyllabification and the consonant palatalization phenomenon. Thus, early reading of multi-syllable Hangul words might sometimes be linked to RAN as found in English studies (e.g., Logan et al., 2011).

Although reading and writing rely on similar processes, spelling is more complex and difficult than reading in most orthographies (Cho, & Chiu, 2015; Fitzgerald & Shanahan, 2000). For example, in Korean, the sound of /t/ in the coda position can be written using six different consonant letters (e.g., ㅅ, ㅆ, ㅈ, ㅊ, ㄷ, ㅌ). Accurate Hangul writing requires accessing multiple associations between sounds and letters (e.g., Perfetti, 1992) and specific orthographic knowledge (e.g., Kessler & Treiman, 2003; Savage et al., 2008). Thus, Hangul skilled writing may be related to both phonological awareness and RAN. To date, few studies have dealt with the link of RAN with Hangul word writing among Korean kindergartners.

Given that these cognitive skills of phonological awareness, RAN, and morphological awareness have been demonstrated to be uniquely associated with young Korean children's reading and writing acquisition in some previous studies, all were included in the present study. Although our main focus in the present study was on whether mothers' cognitive support of scaffolding their children's writing

would be uniquely associated with children's reading and writing, the current study also focused on these cognitive skills themselves given that Hangul has been relatively rarely studied in previous studies. Our focus on mothers' informal strategies for teaching writing of Korean and cognitive correlates of Hangul reading may complement earlier work on both parental involvement (e.g., Cho, McBride & Lin, 2017; Kim, 2009) and individual children's cognitive skills in relation to Hangul acquisition (e.g., Cho & McBride-Chang, 2005; Cho et al., 2008; Kim, 2007; 2011) to demonstrate how parent–child interactions might further facilitate the literacy acquisition process.

Mother–child joint writing paradigm and literate mediation scales

The mother–child joint writing paradigm was previously highlighted by Aram and Levin (2001, 2004) for Hebrew, Skibbe, Bindman, Hindman, Aram and Morrison (2013) for English, Lin et al. (2009, 2012) for Chinese characters, and McBride-Chang et al. (2012) for Chinese Pinyin, a phonological coding system used to teach Chinese. In the paradigm, mothers of young children can scaffold their young children's literacy learning by helping the children to write simple words that they previously did not know how to write. In alphabetic languages such as English and Hebrew, optimal maternal literate strategies have focused on sounds of letters, which were most strongly associated with children's independent literacy skills among Israeli and English-speaking children (Aram & Levin, 2001; 2004; Skibbe et al., 2013). However, such phonological strategies on the part of mothers are rare and uncorrelated with Chinese character acquisition itself in Chinese children. Rather, maternal strategies focused on meaning-related units, including both semantic radicals and whole characters, tend to be positively associated with children's independent character recognition and writing (Lin et al., 2009, 2012).

Indeed, maternal literate mediation scales have differed dramatically in different orthographies. In the scales developed in Hebrew and English studies (Aram & Levin, 2001, 2004; Skibbe et al., 2013), higher levels of maternal mediation were linked to phonological units such as phonemes with letter names, suggesting that optimal maternal mediation for Hebrew implies a grapheme-phoneme encoding process in letter-by-letter fashion. However, maternal strategies in Chinese mother–child joint writing of Chinese characters have focused on visual patterns of strokes and characters, character structures, and phonetic and semantic radicals and morphology of a character (e.g., Lin et al., 2009, 2012). Higher levels of a Chinese maternal mediation scale tend to be related to semantic radicals of a character and morphological information at the character level (Lin et al., 2009). A scale of Korean maternal mediation strategies should be different from both alphabetic and Chinese writing systems because the Korean script is an alphasyllabary (Taylor & Taylor, 2014) and because salient psycholinguistic grain sizes of Korean are CV (body) and coda subsyllabic units (e.g., Ziegler & Goswami, 2005). Higher levels of a Korean maternal mediation scale should be related to CV and coda subsyllabic units.

The importance of maternal literate mediation of writing for children's literacy development has also been documented in Korea. Cho, McBride and Lin (2017) examined Korean mothers' literate mediation strategies for their 4-and 5-years old children to identify eight maternal strategies focusing on alphabet letters, whole Gulja (Korean written syllable), and consonant–vowel (CV) and coda subsyllabic units, visual aspects of strokes, whole pattern and Gulja structure, and syllable meaning. In their study, among the eight strategies, only two strategies were positively related to children's reading skills. That is, maternal coda focus was uniquely associated with children's word reading after controlling for mothers' education and children's age, vocabulary, and writing skill. This maternal literate strategy, focused on the CV subsyllabic unit, explained children's reading of CV Gulja. Although Cho et al. (2017) demonstrated the importance of maternal cognitive mediation strategies during mother–child joint writing in children's independent reading development, they did not develop a scale but simply focused on several independent strategies such as coda and CV subsyllabic units. In addition, Cho et al. (2017) did not test for longitudinal effects on literacy development. Given limited studies focusing on maternal literate mediation in Korea, the issue of maternal mediation of writing in Korean is not yet well understood. In the present study, we created a scale that could be considered ordered from lower to higher levels of maternal cognitive mediation. Furthermore, we examined the unique contribution of mean levels of maternal literate mediation to Korean children's independent literacy skills concurrently and longitudinally across 1 year after statistically controlling for demographics information and children's cognitive skills.

Not many studies have reported longitudinal relations of maternal literate mediation to children's literacy development in either Korean or in other orthographies. Among the few studies that have, in Hebrew-speaking children, maternal literate mediation during kindergarten contributed to children's spelling and reading comprehension longitudinally 2.5 years later after statistically controlling for SES, word writing, and linguistic knowledge (Aram & Levin, 2004). Skibbe et al. (2013) found that maternal graphophonemic support focused on letter-sound correspondence predicted children's decoding of letter and word identification and phonological awareness longitudinally across 1 year with time 1 autoregressive effects controlled. In a Chinese study, maternal Pinyin mediation predicted a significant amount of variance in Chinese children's word reading 1 year later over and above children's age and non-verbal IQ (McBride-Chang et al., 2012). However, none of these longitudinal studies statistically controlled children's cognitive skills such as phonological processing and morphological awareness. The data reported here represent one of the first studies of longitudinal effects of maternal literate support in Korea. The extent to which maternal literate mediation support would more or less strongly contribute to children's independent Hangul reading and writing across 1 year was unclear.

Research questions

To summarize, we asked three main research questions. First, what constitutes the best Korean scale of maternal literate mediation strategies? We began by first considering all maternal literate strategies from Cho et al. (2017) and ordering them from lower to higher levels of maternal literate mediation in order to derive a typical level of the most frequently used strategy, because we were not sure initially how different strategies would be ordered. We hypothesized that higher levels of the Korean scale would be related to CV and coda subsyllabic strategies.

Second, we examined whether maternal literate support would contribute to Hangul reading and writing concurrently and longitudinally across 1 year, with mother education and children's age, nonverbal intelligence, independent phonological and morphological awareness, and RAN skills statistically controlled. We predicted that maternal literate support would positively predict word reading and writing across 1 year after statistically controlling for the cognitive correlates, consistent with findings from previous research with different orthographies (Aram & Levin, 2004; McBride-Chang et al., 2012).

Third, we examined how phonological awareness, morphological awareness, and RAN are related to Hangul reading and writing, along with maternal literate mediation, concurrently and longitudinally. We expected that both phonological and morphological awareness would be related to Hangul reading and writing because Hangul is an alphasyllabary and compounding morphology is especially salient in Korean as in Chinese (e.g., Cho & McBride-Chang, 2005; Cho et al., 2008; Kim, 2007; Wang et al., 2009). However, the links of RAN with Hangul reading and writing were not clear due to inconsistent evidence found in reading studies and little evidence related to Hangul writing. Based on the studies done in other languages such as English, however, we expected that RAN would be related to early Hangul reading as young children likely read Hangul words by basic sight vocabulary rather than by decoding as early readers of English would do (e.g., Savage et al., 2008). At the same time, we anticipated that RAN would be related to skilled writing because accurate and skillful writing requires orthographic knowledge that RAN might capture (Kessler & Treiman, 2003).

Method

Participants

This study consisted of 51 4-year-old children in kindergarten year 1 at testing Time 1 (T1) (31 girls and 20 boys, mean age $M = 4.92$ years, $SD = .30$), who were from four kindergartens, and 44 5-year old children in kindergarten year 2 at testing T1 (18 girls and 26 boys, mean age $M = 5.83$ years, $SD = .30$) from three kindergartens and their mothers. They were subsequently followed up at Time 2 (T2) 1 year later. All children and mothers were native Korean speakers. All of the kindergartens were located in middle SES backgrounds in a medium-sized city in a southern part

of South Korea. The four kindergartens followed the same Korean governmental curriculum for literacy education (Ministry of Education, Science & Technology, 2007). Kindergartens used whole-word methods to encourage children's learning motivation for literacy but did not explicitly teach alphabet and decoding skills and did not use textbooks. Popular activities for literacy education included in the kindergartens were using flash cards, rote-copying words, utilizing syllables in name tags, and listening to stories and sharing experiences in circle times (Cho, 2017; Lee, Park, & Kim, 2000).

Research design

Mothers and their children were observed engaging in a joint writing activity at their homes at T1. Mothers were provided with 24 picture cards, with each picture drawing a two-syllable word. Mothers were asked to help their children to write the words in a notebook, writing one syllable in each page. Children's cognitive-linguistic skills were also assessed at their homes or at schools at T1. Literacy skills of word reading and writing were tested at children's schools at T1 and at T2 1 year later. Maternal literate mediation and children's cognitive skills were the predictor variables in the study, and children's literacy skills were the dependent variables (e.g., Skibbe et al., 2013). Multivariate multiple regression techniques were employed to examine the longitudinal relations between maternal literate support and children's reading and writing, as well as relations among other predictor variables and outcome literacy measures (Bruin, 2006; Muthen & Muthen, 2009; Skibbe et al., 2013).

Measures

Mothers' education

Mothers' education level was measured on a 7-point scale with 1 as primary 6th grade, 2 as middle school, 3 as high school, 4 as junior college, 5 as university, 6 as Master's degree level, and 7 as education beyond the Master's level. The mean education level was 4.14 ($SD = .85$, range = 3–5) and 4.32 ($SD = .96$, range = 2–7) for the mothers of 4- and 5-year-old children at T1, respectively. The maternal education levels indicated that our participants were generally from families with middle SES. Note that 58% of 25- to 34-year-old Korean women had attained tertiary and advanced education (Organization for Economic Co-operation and Development, 2009).

Hangul word reading at T1 and T2

A list of 90 words arranged from easier to more difficult items was given to the children, and they were asked to read each word aloud. The first 30 items (e.g., 구두 /gu du/ "shoes", 창문 /ʧaŋ mun/ "window") were phonologically regular words consisting of two syllables and the last 60 words (e.g., 깊이 /gi pi/ "depth", 책꽂이 /ʧek k'o ji/ "bookshelf") were irregular words consisting of two and three syllables.

Regular words could be read correctly by applying Korean grapheme-phoneme correspondence rules, whereas irregular words were subject to phonological changes due to the application of resyllabification, consonantal assimilation, and other Korean phonological alteration phenomena. For example, 깊이 (/gip i/ "depth") is pronounced as 기피 (/gi pi/ "avoidance") due to the application of resyllabification. The task stopped if the child failed to read 5 consecutive items. One point was given for reading a word correctly. The maximum possible score was 90. The internal consistency reliability obtained in this study was .98 at T1 and .97 at T2.

Hangul word writing at T1 and T2

The experimenter dictated the words twice loudly and the child was asked to write them independently on a sheet of paper with a pen. During the task, children were encouraged to try their best to write down the characters they thought were correct. The 20 words tested were selected from story books and standard textbooks in kindergarten and primary schools and were all orally familiar to children. Of the 20 words, 13 words had two syllables and 7 words had more than two syllables; 11 words (e.g., 다시 /da si/ "again", 발명 /bal mjəŋ/ "invention") were phonologically regular and 9 words (e.g., 얼음 /ə rɨm/ "ice", 해돋이 /he do ji/ "sunrise") were irregular. One point was awarded if the whole word was correct. The maximum score was 20 points. The internal consistency reliability was .90 in this study at T1 and .89 at T2.

Phonological awareness at T1

Phonological awareness was measured in the two tasks of syllable deletion and phoneme coda deletion. Each task included four practice items where feedback was given to children. Each task consisted of 18 test items, for which feedback was not given to children. Items in all the tasks were orally presented to children by an experimenter.

Syllable deletion This task included 6 three-syllable words, 6 three-syllable nonwords, and 6 four-syllable nonwords. Children first heard an item, a word (e.g., *bit ja ru* (빗자루) or a nonword and were asked to repeat it. Then, from each item, children were asked to delete one syllable (e.g., *bit ja ru* (빗자루) without *bit* (빗) would be *ja ru* (자루)). Items increased in difficulty level by including real words first and nonwords toward the end of the testing and by deleting first and last syllable at the beginning and middle syllable at the end. The item ordering was based on previous findings in English (McBride-Chang, 1995) as well as in Korean (Cho et al., 2008).

Phoneme coda deletion For this task, children were orally presented with nine one-syllable CVC real words and nine CVC nonwords. Children first heard an item, a word (e.g., *gang* (강)), or a nonword, and were asked to repeat it. Then, they were asked to delete the final phoneme from the item. For example, saying *gang* (강) without the final sound would be *ga* (가). For each of practice items, in addition, children were told that an item (e.g., *gang* (강)) is composed of a first

sound (e.g., /g/), a middle sound (e.g., /a/) and a final sound (e.g., /ŋ/) before they were asked to delete the final sound. Items increased in difficulty level by including words first and nonwords at the end. Item ordering was based on Korean studies (e.g., Cho et al., 2008) and earlier theoretical backgrounds suggesting advantages for words over nonwords in phoneme identification and manipulation (Cutler, Mehler, Norris, & Segui, 1987; McBride-Chang, 1995; Read, Yun-Fei, Hong-Yin, & Bao-Qing, 1986).

In the two deletion tasks, experimenters stopped testing when five consecutive items were failed. For each item correctly answered, 1 point was allotted. The maximum score was eighteen in the two tasks. The internal consistency reliabilities were .92 and .94 in the syllable and coda deletion tasks, respectively.

Morphological awareness at T1

Morphological awareness was measured using a task of morphological construction (Cho et al., 2008; McBride-Chang et al., 2005). Children were asked to combine familiar morphemes to create new compound words that are linguistically sensible but do not exist as real words, within the context of a three-sentence story. For example, one scenario was "The mountain that is made up of rocks is called *rock mountain*. What would we call the mountain that is made up of popcorn?" The correct answer would be "popcorn mountain". There were 26 items and the maximum possible score was 26 points. The internal consistency reliability obtained in this study was .87.

Number naming speed (RAN) at T1

The same five digits were arranged in different orders across five rows and children were asked to name all items as quickly as possible in order to measure children RAN for numbers. Children were given two trials of the task and the average speed across these two trials was used in our analyses.

Nonverbal reasoning at T1

Two sets of A and B from Raven's Standard Progressive Matrices (RCPM; Raven, Court, & Raven, 1996) were used to measure children's non-verbal IQ. There were 24 items, and the maximum possible score on this task was 24. The internal consistency reliability obtained in this study was .74.

Maternal mediation task in mother–child joint writing at T1

Twenty-two two-Gulja words were presented to the mother–child dyads. Mothers were asked to help their children to write the words in a notebook, writing each Gulja in a page. Words were presented on picture cards, rather than in print, to encourage mothers to use different strategies of going over the words, rather than merely asking children to copy from given cards, following the procedure set forth by Aram and Levin (2001, 2004). The whole mother–child interaction was

videotaped and served as the basis for measuring all aspects of maternal mediation that were coded. During the process, mothers and children spoke in their native language, Korean. A similar procedure was used in previous studies, both in Korean (Cho et al., 2017) and Chinese (e.g., Lin et al., 2009).

All videotapes were coded by a trained student coder who was unaware of the study purpose. Initially, Cho et al. (2017) identified eight categories for coding based on the strategies displayed by mothers. Among the eight categories, two categories were excluded from the Korean scale of this study because one strategy (holistic visualization) was rarely mentioned by mothers (e.g., < 3% of mothers mentioned it) and because the other strategy (Gulja meaning) was often mentioned together with the other strategy of Gulja matching. All categories are conceptualized to be independent from one another (e.g., Lin et al., 2012). Based on statistical analyses and conceptual backgrounds as done previously (e.g., Aram & Levin, 2001, 2004; Cho et al., 2017; Lin et al., 2009, 2012; McBride-Chang et al., 2012) we ordered the strategies. For example, according to the statistical analyses of Cho et al. (2017), Coda ($r = .70$), CV ($r = .57$), and Gulja structure ($r = .38$) strategies were significantly and positively correlated with CV Gulja reading among 4-year olds whereas other strategies were not significantly correlated. However, Gulja matching strategy ($r = -.20$) was negatively, albeit nonsignificantly, correlated with word reading among 5-year olds although other strategies except Coda ($r = .57$) were not significant. The tentative Korean scale is as follows. The Korean scale ranged from more of a whole "Gulja" level focus on words by mothers to a CV and a coda analysis of the syllables within words. The number of levels indicates the ordering of the strategy from low to high.

1. *Mothers point out the Gulja that is written in other words and names (Level 1: Whole Gulja)*. For example, in writing 벌 /bəl/ in the word 벌꿀 /bəl k'ul/ ("honey"), a mother says that this is the same Gulja as in the 꿀벌 /k'ul bəl/ ("honey bee") the child just wrote.
2. *Mothers point out strokes and features within Korean alphabet letters (Level 2: Visual Stroke)*. For example, a mother says that a vertical line should go here and should be long.
3. *Mothers points out alphabet letter names (Level 3: Letter)*. For example, mothers utter alphabet letter names such as *iung* (ㅇ), *o* (ㅗ), and/or *kiek* (ㄱ) for children to write 옥 /ok/ "house".
4. *Mothers refer to the Gulja's structure (Level 4: Gulja Structure)*. For example, a mother says that ㅎ /h/ is written at the top and ㄱ /k/ at the bottom in the example of 흑 /hɨk/. She also sometimes points out the position of each alphabet letter in relation to the Gulja (e.g., always on the left; on the top, etc.).
5. *Mothers focus on CV (Level 5: CV)*. Mothers point out CV (consonant + vowel) subsyllabic unit within a CVC Gulja. For example, mothers say to write 시 /si/ in the Gulja of 신 /sin/ "shoe".
6. *Mothers point out coda (Level 6: Coda)*. Mothers mention the alphabet letter name of the coda to the child or ask to correctly write a coda if the child correctly writes CV but misses or incorrectly writes the coda. For example, if a child wrote 실 /sil/ for the correct Gulja 신 /sin/ "shoe", the child wrote CV

subsyllabic unit (시 /si/) correctly but coda (final consonant) incorrectly. In this case, mother might ask to replace ㄹ /l/ with correct coda ㄴ /n/.

Across all mother–child dyads, the unit of analysis by mothers was uniformly the Gulja level. Mothers addressed the writing task Gulja by Gulja. Thus, strategies described above were consistently applied to individual Korean Gulja (2 per word). Given this unit of analysis, prior to the computation of maternal mediation scores, the frequency of valid mediated Gulja of each child was recorded as the general raw score. Because of variations in literacy competence, some children needed mothers' help in writing certain Gulja, whereas others wrote independently without getting any help at the Gulja level. Thus, because our focus in the present study was on maternal mediation of writing, we excluded all Gulja that the child could write without any help, because, by definition, in these cases, maternal mediation was not involved. In total, an average of 30.4 and 61.3% of the Gulja were excluded from analyses for mothers of 4- and 5-year old children, respectively. In addition, we had 27 (1.2%) and 40 (2.1%) instances in which mothers themselves incorrectly taught the Gulja for 4- and 5-year-old children, respectively. These instances were also excluded from our analyses because we wanted to focus on writing of standard words, and these mistakes indicated that mothers were writing these words in nonstandard ways.

The method we used to calculate the maternal mediation scores for literate mediation was the same as that of Cho et al. (2017). Thus, in computing mothers' scores in literate mediation, we calculated the percentage of each strategy that the mother used as follows:

$$\frac{\text{Number of valid mediate Gulja under a particular strategy}}{\text{Total number of valid mediated Gulja (General raw score)}} \times 100\%$$

Using these filtering mechanisms and the above-identified categories, all videotapes were coded by trained student helpers who were unaware of the study hypotheses. Approximately 25.3% of these cases (24 cases) were double coded to check inter-rater reliabilities. The interrater reliabilities were obtained by a Cohen κ statistic with the coded data (κ = .89, .82, .87, .96, .83, and .83 for Whole Gulja, Visual Stroke, Letter, Gulja-Structure, CV, and Coda strategies, respectively).

To examine the mothers' most often used mediation strategy, the strategy with the highest frequency was selected. In incidences in which two or more strategies shared the highest frequency, the one with the more advanced hypothesized level was selected to represent the most used score.

Procedure

Measures of maternal mediation of word writing and phonological awareness were tested individually at children's homes by trained psychology student interviewers. Demographics information from parents was also collected at this time. The remaining testing of Hangul word reading, Hangul word writing, RAN, nonverbal reasoning and morphological construction was carried out at individual

kindergartens. The order of the home and school sessions was randomly varied across participants. During the home session, the maternal mediation task was first administered, typically lasting about 30 min. At T2 children were tested at school with the measures of word reading and writing after 12 months.

Results

Table 1 shows the means, standard deviations, and comparisons across all of the maternal strategies and the most-often used strategy. Because of the large standard deviations of maternal literate strategies, further analyses were conducted on the square-root transformed proportions of maternal literate strategies. Compared to the mothers of 5-year-olds, mothers of 4-year-old children tended to make greater use of Whole Gulja (Level 1) ($t(93) = -1.97$, $p = .052$) and Visual Stroke (Level 2) ($t(93) = -2.83$, $p < .01$), and less frequently to use the Coda strategy (Level 6) ($t(93) = 4.62$, $p < .001$). However mothers of 4-year-old children tended to similarly use the strategies of Letter (Level 3), Gulja Structure (Level 4), and CV (Level 5). The most-often used strategy in teaching Hangul Gulja to their children was higher in 5-year olds than in 4-year olds ($t(93) = 2.93$, $p < .01$).

Means, standard deviations, and reliabilities for all other measures in the two age groups are reported in Table 2. All the measures except RAN were normally distributed with good variability by showing that kurtosis absolute values were smaller than 1.54 and skewness absolute values were < 1.42. The logarithm transformations were conducted on the data of RAN for further analyses. Internal consistency reliabilities for all the measures were in normal range. Skills on all literacy and cognitive measures presented as raw scores increased across age levels.

Pearson's correlation coefficients of each of the strategies with the most-often used strategy, literacy, and cognitive measures are shown separately for the 4- and 5-year old children in Table 3. In the 4-year old children, only Level 5 (CV) and Level 6 (Coda) were positively correlated with reading and writing measures at T1 and T2 whereas other levels of strategies were not significantly associated with literacy measures. In the 5-years old children, four of the strategies were significantly associated with Hangul reading and/or writing at T1 and T2. Specifically, the correlation coefficients for Level 1 (Whole Gulja) and Level 3 (Letter) were significantly and negatively associated with word reading and writing at T1 and writing at T2; correlation coefficients of Level 2 (Visual Stroke) were negatively associated with writing at T1. However, the correlations of Level 6 (Coda) were significantly and positively associated with all of the literacy measures at T1 and T2. Levels 4 (Gulja Structure) and 5 (CV) were not significantly associated with literacy measures among 5-year olds.

To further validate the literacy maternal measure, we correlated the most frequently used strategy with Hangul reading and writing at T1 and T2 for each age group as shown in Table 3. This correlation was moderate concurrently (rs $> .46$, ps $< .001$) and longitudinally (rs $> .38$, ps $< .01$) in both age groups. In addition, the correlation coefficients of the typical literate mediation scores were significantly associated with syllable and coda deletion (rs $> .35$, ps $< .05$), RAN (rs $> |-.32|$,

Table 1 Mean scores and standard deviations of Korean maternal literate mediation scale across 4- and 5-year old children and the *t* values

Measures	4-year olds		5-year olds		*t* value
	Mean	*SD*	*Mean*	*SD*	*t*(93)
Level 1[a]	.21	.15	.15	.13	− 1.97+
Level 2	.10	.11	.07	.09	− 2.83**
Level 3	.26	.21	.23	.21	− .51
Level 4	.21	.20	.18	.18	− .89
Level 5	.28	.22	.28	.20	.03
Level 6	.15	.17	.35	.27	4.62***
Typical level[b]	3.84	1.82	4.86	1.53	2.93**

$N = 51$ (4-year olds), $N = 44$ (5-year olds)

[a] Mean scores in each level represents proportions

[b] Typical level represents most frequently used level in maternal literate mediation

+ $p = .052$; * $p < .05$; ** $p < .01$; *** $p < .001$

Table 2 Means and standard deviations, reliabilities and *t* values of literacy and cognitive measures across 4- and 5-year old children

Measures	4-year olds		5-year olds		Reliability	*t* value
	Mean	*SD*	*Mean*	*SD*		*t*(93)
Age (month)	59.02	3.61	70.16	3.14		16.12***
Mother education (7)	4.14	.85	4.32	1.00		.98
Word reading T1 (90)	28.10	22.73	44.43	17.92	.98	3.85***
Word writing T1 (20)	4.29	4.65	8.66	3.61	.90	5.05***
Nonverbal IQ T1 (24)	10.57	3.07	14.25	3.20	.74	5.71***
Syllable deletion T1 (18)	4.88	4.20	8.84	4.91	.92	4.23***
Coda deletion T1 (18)	9.14	6.29	12.43	4.88	.94	2.82**
RAN T1 (sec)	22.19	10.01	15.44	4.70	.80	− 5.07***
Morphological awareness T1 (26)	6.45	4.23	11.27	5.06	.88	5.06***
Word reading T2 (90)	48.90	21.40	68.36	10.79	.97	5.46***
Word writing T2 (20)	10.49	4.96	14.95	2.26	.89	5.49***

$N = 51$ (4-year olds), $N = 44$ (5-year olds). All reliabilities listed are internal consistency reliabilities except for the RAN, which was measured as test–retest reliability

* $p < .05$; ** $p < .01$; *** $p < .001$

ps $< .05$) in both age groups, and morphological awareness ($r = .39$, $p < .01$) only in 5-year olds. These results suggest that the scale of literate mediation may reflect a reasonable ordering of strategies, with more advanced/higher order indicating children's better performance in literacy and cognitive skills.

Table 3 Correlations among Korean maternal literate mediation and literacy and cognitive-linguistic measures separately in 4- and 5-year old children

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Level 1	1	.12	.28	.19	.02	− .33*	− .42**	− .18	− .16	− .11	.17	− .35*	− .40**	− .48**	− .26	− .42**
2. Level 2	.28	1	.29	.13	− .09	− .13	− .28	− .15	− .32*	− .27	.06	− .35*	− .15	− .40**	− .07	− .22
3. Level 3	.12	.20	1	.30*	.19	− .63**	− .42**	.02	− .41**	− .43**	.38*	− .25	− .41**	− .43**	− .24	− .36*
4. Level 4	.18	.18	.29*	1	− .19	.01	.01	.12	− .13	− .10	.24	.19	− .22	− .18	.02	− .23
5. Level 5	.23	.04	.27	.41**	1	− .45**	− .09	− .28	− .27	− .06	.14	− .40**	− .21	− .15	− .12	− .07
6. Level 6	− .06	− .02	− .14	.24	.37**	1	.71**	.24	.43**	.64**	− .40**	.38*	.56**	.59**	.37*	.39**
7. Typical level of mediation	− .30*	− .11	.01	.23	.56**	.60**	1	.27	.46**	.65**	− .35*	.39**	.61**	.54**	.39**	.39**
8. Nonverbal IQ T1	.12	.11	.13	.11	.14	.30*	.20	1	.32*	.08	.05	.40**	.12	.05	.09	.08
9. Syllable deletion T1	− .06	− .14	− .03	.16	.22	.60**	.35*	.12	1	.62**	− .51**	.54**	.51**	.58**	.43**	.42**
10. Coda deletion T1	.10	.10	− .02	.28*	.52**	.70**	.43**	.30*	.60**	1	− .51**	.30	.48**	.60**	.42**	.42**
11. RAN T1	− .24	− .25	− .08	− .46**	− .41**	− .39**	− .32*	− .20	− .36**	− .52**	1	− .14	− .48**	− .51**	− .19	− .36*
12. Morphological awareness T1	− .05	.09	.01	.15	.02	.25	.14	.07	.25	.37**	− .20	1	.49**	.53**	.42**	.45**
13. Word reading T1	− .12	− .06	− .07	.18	.33*	.84**	.60**	.31*	.59**	.73**	− .47**	.38**	1	.76**	.41**	.66**
14. Word writing T1	− .07	− .02	− .12	.23	.23	.68**	.46**	.30*	.65**	.63**	− .33*	.43**	.82**	1	.47**	.63**
15. Word reading T2	.12	− .06	− .01	.26	.37**	.56**	.38**	.25	.49**	.59**	− .55**	.23	.71**	.57**	1	.28
16. Word writing T2	− .11	− .02	− .09	.22	.36*	.71**	.56**	.33*	.56**	.74**	− .56**	.38**	.86**	.71**	.74**	1

Correlations above the diagonal represent associations among the 5-year olds; correlations below the diagonal represent associations among the 4-year olds

* $p < .05$; ** $p < .01$

To examine relations between maternal literate mediation and children's reading and writing at T1 and T2 across 1 year after controlling for demographics information and children's cognitive-linguistic skills at T1, we used multivariate multiple regression techniques (Bruin, 2006; Muthen & Muthen, 2009; Skibbe et al., 2013). In preparation for our regression tests, we found that our data did not have serious multicollinearity problems since correlations between independent variables were in the range of .20 to .65 in the two age groups in our data set. A rule of thumb is that if the correlation coefficients between two independent variables are > .8, the multicollinearity problem is viewed as serious (Gujarati, 1995). In the subsequent analyses, we combined the two samples since patterns of correlations across samples appeared fairly similar in the 4-year-old and 5-year-old children separately (e.g., Cho et al., 2008).

A multivariate multiple regression model included two outcome measures of reading at T1 and T2 and all predictor variables, including typical level of maternal mediation, children's age, mother's education, and children's cognitive skills at T1 such as nonverbal reasoning, syllable deletion, coda deletion, morphological awareness and RAN skills. One advantage of estimating two equations for reading at T1 and T2 as a single model is that we could conduct tests of the coefficients of maternal literate support across reading outcomes at T1 and T2 (e.g., Bruin, 2006). As a result, we found that the coefficients for maternal literate mediation, taken for both reading measures at T1 and T2 together, were statistically significant (the Wald test statistic = 15.109 with 2 degrees of freedom, $p < .0005$), suggesting that maternal literate support contributed to reading at T1 and T2 across 1 year. In addition, our multivariate multiple regression also produced regression coefficients of predictor variables and the R-square statistic for each of the reading outcomes at T1 and T2, which are shown in Table 4. Standardized regression coefficients showed that maternal literate support (ß = .29, $p < .001$), coda deletion (ß = .26, $p = .004$), RAN (ß = − .18, $p = .026$), and morphological awareness (ß = .21,

Table 4 Results of multivariate multiple regression explaining Korean word reading at T1 and T2 from the maternal literate mediation for the combined sample of 4- and 5-year-old children along with demographic information and children's cognitive-linguistic variables included

Variables	Hangul word reading T1			Hangul word reading T2		
	β	*z*-value	R^2	β	*z*-value	R^2
Age	− .10	− 1.30	.64	.09	.99	.49
Mother education	− .03	− .45		.02	.22	
Nonverbal IQ T1	.05	.66		.09	.98	
Syllable deletion T1	.13	1.47		.11	1.01	
Coda deletion T1	.26	2.88**		.24	2.25*	
RAN T1	− .18	− 2.23*		− .25	− 2.61**	
Morphological awareness T1	.21	2.72**		.09	.92	
Typical level of maternal mediation	.29	3.89***		.09	.94	

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 5 Results of multivariate multiple regression explaining Korean word writing at T1 and T2 from the maternal literate mediation for the combined sample of 4- and 5-year-old children along with demographic information and children's cognitive-linguistic variables included

Variables	Hangul word writing T1			Hangul word writing T2		
	β	*z*-value	R^2	β	*z*-value	R^2
Age	− .02	− .22	.63	.09	1.19	.63
Mother education	− .01	− .07		.01	.19	
Nonverbal IQ T1	.03	.34		.08	1.09	
Syllable deletion T1	.28	3.05**		.01	.15	
Coda deletion T1	.23	2.47*		.34	3.67***	
RAN T1	− .09	− 1.11		− .23	− 2.72**	
Morphological awareness T1	.25	3.18***		.15	1.85	
Typical level of maternal mediation	.16	2.09*		.17	2.24*	

* $p < .05$; ** $p < .01$; *** $p < .001$

$p = .007$) were the unique significant correlates in explaining Hangul word reading at T1. Coda deletion (ß = .24, $p = .024$) and RAN (ß = .− .25, $p = .009$) were the unique significant correlates in predicting Hangul word reading at T2 with all variables included together. When all the predictor variables were entered into each equation, they collectively explained 64% of variance in reading at T1 and 49% of reading at T2.

To examine relations between maternal literate mediation and children's word writing across T1 and T2 after controlling for demographics information and children's cognitive-linguistic skills, we conducted a multivariate regression analysis as shown in Table 5. The coefficients for maternal literate mediation, taken for both writing measures at T1 and T2 together, were statistically significant (the Wald test statistic = 6.603 with 2 degrees of freedom, $p < .037$). Standardized regression coefficients showed that maternal literate support (ß = .16, $p = .036$), syllable deletion (ß = .28, $p = .002$) and coda deletion (ß = .23, $p = .014$), and morphological awareness (ß = .25, $p = .001$) were the significant correlates in explaining Hangul word writing at T1. In addition, maternal mediation support (ß = .17, $p = .025$), coda deletion (ß = .34, $p < .001$) and RAN (ß = − .23, $p = .007$) were the only significant correlates in predicting Hangul word writing at T2. When all the variables were entered into each equation, they explained 63% of each of the writing outcomes at T1 and T2.

Discussion

The present study has highlighted three dimensions of early Korean literacy development. First, the Korean scale of maternal mediation of writing in Korean children developed is valid and potentially useful for explaining Korean children's literacy acquisition. Second, we further demonstrated the significant contribution of

maternal literate support to children's independent word reading and writing concurrently at T1 and longitudinally at T2 across 1 year after controlling for demographics information and children's cognitive-linguistic skills. Third, children's coda awareness was strongly related to word reading and writing at T1 and T2. RAN was linked to word reading at T1 and T2 but only to writing at T2.

We created a Korean scale of maternal literate mediation based on the different cognitive strategies using statistical analyses as done previously (e.g., Aram & Levin, 2001, 2004; Cho et al., 2017; Lin et al., 2009, 2012). These statistical analyses have, in previous work, basically revolved around forming a scale based on negative and positive associations with word reading and writing. The strategies focused on rote Gulja match, visual stroke, and letter tended to be significantly and negatively associated with word reading and/or writing; those in the middle were associated in the 0 range with literacy skills; and the coda strategy ultimately placed at the top of the scale was positively associated with word reading and writing. These findings suggest that these strategies may have been effective in differentiating children's Hangul reading and writing performances. Mothers' frequent use of less advanced strategies was associated with children's less advanced performance of Hangul reading and writing, and mothers' frequent use of an advanced strategy (a focus on coda) was associated with children's better performance. To further validate the literate mediation measure, we correlated mothers' most frequently used mediation strategy with children's Hangul reading and writing. These positive and significant associations suggest that the newly developed Korean scale of literate mediation may reflect a reasonable ordering of strategies, with more advanced/higher order literate mediation indicating children's better performance in literacy and cognitive skills.

Overall findings from this scale reflect the uniqueness of the Korean scale and differ strikingly from what has been found in other scripts, such as Hebrew (Aram & Levin, 2001, 2004), English (Skibbe et al., 2013), and Chinese (Lin et al., 2009, 2012). In the scales developed within Hebrew and English studies, higher levels of maternal mediation of writing were linked to decoding grapheme to phoneme correspondence in letter-by-letter fashion. Higher levels within the Chinese scale tended to be related to semantic radicals of a character and morphological information at a character level (Lin et al., 2009). However, higher levels of the present Korean scale were related to CV and coda subsyllabic units. The coda strategy was used significantly more often by mothers of 5-year-olds and was uniformly positively associated with reading and writing performances at T1 and T2 in both age groups. Our finding supports the idea that Korean script is an alphasyllabary (Taylor & Taylor, 2014) and that salient psycholinguistic grain size of Korean language would be CV (body) and coda subsyllabic units (e.g., Ziegler & Goswami, 2005). In general, higher levels of support likely help Korean children break down syllables into their salient grain sizes such as CV and coda subsyllabic units. On the other hand, the focus on whole Gulja tended to occur in the lower level and was negatively correlated with Hangul word reading and writing at T1 concurrently and with writing longitudinally in 5-year olds. In addition, a maternal focus on letters was also negatively correlated with word reading and writing at T1 and writing at T2 in 5-year old children. Focusing on the whole Gulja and the letter

might not be effective in the initial stage of Hangul acquisition; by themselves, these are not enough to master the alphasyllabary of Hangul.

Consistent with previous research (e.g., Aram & Levin, 2001, 2004; Lin et al., 2009, 2012; McBride-Chang et al., 2012; Skibbe et al., 2013), children whose parents provided higher levels of maternal literate support had better reading and writing concurrently and longitudinally across 1 year after controlling for demographics information and children's cognitive skills such as syllable and phoneme awareness, morphological awareness, and number RAN skill. Our findings are in line with those from previous research studies focused on different orthographies such as Hebrew, English and Chinese. Particularly, our findings are noteworthy in that none of the previous longitudinal studies had included cognitive-linguistic variables to examine the unique longitudinal effects of maternal literate support.

In the Korean scale, the fact that the coda strategy was the highest level underscores its potential utility as a teaching strategy for both parents and teachers of preschoolers. In other words, it might be ideal to teach Korean CV syllables within a CV syllable chart first and then the coda to read and write Hangul words. Importantly, the CV syllable chart had been typically used for teaching Hangul from the mid fifteenth century until the mid twentieth century (Taylor & Taylor, 2014). However, its use has been reduced since the 1980s partly because whole-word and whole Gulja instructions were implemented in the Korean national kindergarten curriculum and partly because phonics instruction has been emphasized for early literacy acquisition in the education business market (Cho, 2017; Lee, Park, & Kim, 2000). However, the highest level of coda strategy in the present study supports previous psycholinguistic research that underscored the body and coda of a syllable as the primary subsyllabic units in reading and speaking of Korean (Yi, 1998; Yoon et al., 2002). In particular, the sound of the coda often changes depending on sound context, potentially resulting in a mismatch between letter and sound. This phonological irregularity in coda position is caused by resyllabification and sound assimilation phenomena of the Korean language. It is also attributable to the phonotactic constraint, i.e., that only seven consonant phonemes are permissible in the coda position, although 19 simple consonant and 6 complex consonant (e.g., ㄱㅅ, ㄴㅈ, ㄹㅂ) letters are written in the coda position (e.g., Kim, 2007). Thus, Korean children have to be sensitive to the final, as compared to the initial, position in a syllable in order to learn to read and spell Hangul correctly.

This "primacy" of the coda may also explain why, in this study, children's coda phoneme awareness was significant in predicting word reading and writing concurrently and longitudinally. Similarly, in a concurrent study, Cho et al. (2008) showed that coda awareness was a unique independent correlate of reading regular and irregular Hangul words among Korean kindergartners. Ours is one of the first studies to demonstrate longitudinal effects of children's coda awareness on early Hangul literacy development.

Apart from the maternal mediation variables documented in the present study, it should be noted that we examined independent cognitive skills such as RAN and morphological awareness in relation to both word reading and writing. In this study, RAN was found to be important in Hangul reading at T1 and at T2, and writing only

longitudinally at T2 but not concurrently at T1. Similarly, Cho et al. (2008) showed a significant link between RAN and early Hangul reading concurrently among kindergarteners. However, Cho and Chiu (2015) reported a nonsignificant link of RAN to skilled reading but a significant link to skilled writing among 5th graders. These two previous studies suggest that RAN may be more closely linked to early Hangul word reading and skilled Hangul writing. Our RAN results are also consistent with this suggestion in that RAN was associated with Hangul word reading at both times T1 and T2 but RAN was linked to writing at T2 only. Early Hangul learners would likely read Hangul words by basic sight vocabulary that RAN might capture (e.g., Savage et al., 2008). More skilled Hangul writing would also require orthographic knowledge (Kessler & Treiman, 2003). Future studies should explore the relations of RAN with Hangul reading and writing more in depth.

In addition, and in contrast to previous work by Kim (2011), morphological awareness was a unique correlate of both word reading and word writing at T1, although not at T2, of these Korean preschoolers (see also Cho et al., 2008, for similar results). Korean children develop grammatical and compounding morphology at relatively early ages (Zho & Lee, 1981). Clearly, results related to various metalinguistic skills might differ depending on the types of morphological tasks and the other variables included in analyses in each study. A recent study demonstrated that morphological compounding awareness was more strongly associated with Hangul reading and writing for younger compared to older elementary school children (Cho, Chiu, & McBride-Chang, 2011), suggesting that diverse types of morphological awareness, including compounding, grammatical morphology, and homophone awareness, might be particularly important in literacy development of Korean young children. This issue should continue as a future direction of research.

Perhaps the strongest critique of this study has to do with its small sample size. The 95 mother–child dyads were difficult to recruit and videotape. This type of work is painstaking and requires an extensive focus on coding. Therefore, having obtained samples of roughly 100 mother–child dyads across 1 year was already an important feat. Another critique is related to our one-time observation of mother–child joint writing activities. Future work might seek to replicate and refine the Korean scale of maternal literate mediation strategies by using multi-wave longitudinal observations in a larger sample and in diverse samples including multi-cultural families and low income families. A larger sample would facilitate greater confidence in identifying unique correlates of independent literacy skill in preschoolers. Given our findings in this cultural context, however, we would particularly recommend that future research focus particularly on coda-related strategies used by mothers with their children in order to solidify understanding of how this particular approach may facilitate young Korean children's understanding of Hangul.

Despite this limitation, therefore, the present study has extended work on parent–child book reading (Kim, 2009) and mother–child writing in different cultures (e.g., Aram & Levin, 2001, 2004; Lin et al., 2009, 2012; McBride-Chang et al., 2012) to Korean Hangul writing. Our documentation of this new Korean scale of maternal literate mediation to facilitate children's writing has been helpful in understanding what Korean mothers actually do when working with their children on literacy-

related skills. We have found that a Korean scale of maternal literate strategies has never before been documented and that maternal literate support was strongly positively related to early literacy outcomes in Korean children concurrently and longitudinally. Our results imply that maternal mediation support plays an important role in children's literacy development. In particular, the maternal coda strategy and children's coda phonological awareness are apparently especially important for Hangul acquisition in young Korean children. Future work might explore this association in diverse samples and even experiment with coda strategy-related interventions in fostering early Korean children's writing.

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