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Dialogic Reading and Morphology Training in Chinese Children: Effects on Language and Literacy

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This study investigates the effects of parent–child shared book reading and metalinguistic training on the language and literacy skills of 148 kindergartners in Hong Kong. Children were pretested on Chinese character recognition, vocabulary, morphological awareness, and reading interest and then assigned randomly to 1 of 4 conditions: the dialogic reading with morphology training (DR + MT), dialogic reading (DR), typical reading, or control condition. After a 12-week intervention period, the DR intervention yielded greater gains in vocabulary, and the DR + MT intervention yielded greater improvement in character recognition and morphological awareness. Both interventions enhanced children's reading interest. Results confirm that different home literacy approaches influence children's oral and written language skills differently: Shared book reading promotes language development, whereas parents' explicit metalinguistic training within a shared book reading context better prepares children for learning to read.

Keywords: dialogic reading, morphological training, vocabulary, character recognition

The developmental trajectories associated with different components of literacy and oral language are overlapping yet distinguishable (Lonigan, Burgess, & Anthony, 2000; Sénéchal, LeFevre, Smith-Chant, & Colton, 2001). For example, types of parent–child interaction exert differential effects on children's literacy and language skills. Specifically, children's reading skills have been linked to parental reports of explicit teaching of print, while vocabulary and listening comprehension have been linked to early exposure to books in past studies of alphabetic languages (e.g., Sénéchal & LeFevre, 2002). The present study investigates how two forms of parental interaction, namely, dialogic reading (DR; shared parent–child oral communication through book reading) and morphology training (MT; explicit teaching of morphological skills) implemented through DR affect the acquisition of Chinese language and literacy among preschoolers in Hong Kong.

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Parent–Child Reading and Interaction

Parent–child reading provides opportunities for children to learn new words that they may not encounter in daily life and to acquire knowledge about conventions of print and the syntactic structure of language (Wasik & Bond, 2001). The impact of parent–child reading experience on children's concurrent and subsequent language abilities (e.g., Bus, van IJzendoorn, & Pellegrini, 1995; Crain-Thoreson & Dale, 1999; Justice & Ezell, 2000; Payne, Whitehurst, & Angell, 1994; Wood, 2002) and interest in reading (Lyytinen, Laakso, & Poikkeus, 1998; Scarborough & Dobrich, 1994) has been well documented in Indo-European language families.

Although simply reading the text may be of some interest to children, children are also provided with opportunities to use words actively through parent–child interactive conversations (De Temple & Snow, 2003). Such participation is more stimulating for children than is straight reading of the text (Sénéchal, Thomas, & Monker, 1995). Also, verbal and affective interactions during parent–child reading promote children's positive views about and interest in reading (Baker, Mackler, Sonnenschein, & Serpell, 2001). For example, children whose parents had been trained to use interactive reading strategies demonstrated increased interest in shared book reading relative to children whose parents were not trained to use such strategies (Ortiz, Stowe, & Arnold, 2001). However, this effect was based on a comparison between an intervention and a control condition only, and hence the independent contributions of shared book reading and parental behaviors during reading were not separated.

DR

A specific technique of parent–child reading developed by Whitehurst and colleagues called *dialogic reading* (DR) involves high levels of interaction between parents and children (Whitehurst et al., 1988). The method emphasizes the role of feedback

and scaffolded adult–child interactions in picture book reading (Zevenbergen & Whitehurst, 2003). DR has been found to have a positive impact on children's language skills, especially vocabulary, in alphabetic and nonalphabetic languages (e.g., Chow & McBride-Chang, 2003; Hargrave & Sénéchal, 2000; Huebner, 2000; Valdez-Menchaca & Whitehurst, 1992; Whitehurst, Arnold, et al., 1994). For example, Whitehurst et al. (1988) reported a 6-month gain in expressive vocabulary and an 8.5-month gain in expressive language fluency in a group of 2-year-olds through a 4-week DR program implemented at home, and these gains were maintained at a 9-month follow-up assessment. DR has also been shown to be effective in enhancing the Chinese receptive vocabulary development of hearing-impaired children in Hong Kong (Fung, Chow, & McBride-Chang, 2005) and Korean children's oral productive and receptive skills (Lim, 1999).

Despite strong evidence that DR enhances children's oral language skills, few studies have investigated the association between DR and children's literacy development. DR with preschoolers was demonstrated to have a significant effect on children's basic print knowledge (Whitehurst, Epstein, et al., 1994), and the positive effects on emergent literacy skills were maintained through the end of the kindergarten years (Whitehurst et al., 1999). However, the intervention condition in these studies was a combination of a DR program conducted both at home and in school and a classroom-based sound and letter awareness program called Sound Foundations. Therefore, the significant results in these studies could not be attributed solely to the DR method. Nevertheless, the findings in these studies suggest that children might benefit both in oral language and literacy skills from DR if elements of linguistic instruction are added.

Metalinguistic Skills and Chinese Acquisition

Different languages and scripts, with their respective idiosyncratic characteristics, highlight the relative importance of different metalinguistic skills in processing these languages and scripts. For instance, Chinese is a morphosyllabic language in which each character, the primary unit of writing, represents both a syllable and a lexical morpheme. Hence, for example, a two-morpheme Chinese word is written as two characters and spoken as two syllables. Note that in Chinese a lexical morpheme, expressed in speech as a syllable and in writing a character, is almost always itself a word, and that multimorphemic words are often constructed out of lexical morphemes through straightforward compounding. Hence, it is always possible to understand a word without realizing that it is a word rather than a combination of words. Such a morpheme focus, instead of a word focus, is reinforced by reading experience: Printed Chinese words are not spatially marked; only characters, each of which occupies a fixed square space in print, are. Approximately 4,500 characters are in regular use (Liu, Chuang, & Wang, 1975). The majority (about 80%) are ideophonetic compounds, each comprising a meaning component (semantic radical) and a pronunciation component (phonetic radical; Hoosain, 1991). These components provide only rough and holistic cueing to character meaning and pronunciation, respectively.

Because the primary written unit (character) completely overlaps with the basic pronunciation (syllable) and meaning unit (lexical morpheme), syllabic awareness, instead of phonemic awareness, becomes particularly important in Chinese reading acquisition (e.g., Ho & Bryant, 1997; McBride-Chang & Ho, 2000). This is reinforced by a lack of grapheme–phoneme correspondence in written Chinese, which downplays the metalinguistic prominence of phonemes. Therefore, reading Chinese generally sensitizes the reader to syllables, represented as characters, in much the same way as reading an alphabet sensitizes its readers to phonemic segments, represented as letters (Chow, McBride-Chang, & Burgess, 2005; Wagner, Torgesen, & Rashotte, 1994). A parallel argument applies to the meaning side: Because lexical morphemes are consistently represented as characters, one may assume a strong association between Chinese reading and the reader's awareness of the existence and functions of morphemes, or morphological awareness.

Morphological awareness is the awareness of and ability to manipulate the meaning structure of language (Carlisle, 1995). As discussed, the one-to-one-to-one relations among Chinese characters, syllables, and morphemes may promote a high degree of metalinguistic prominence pertaining to syllables and morphemes rather than to words. Hence the importance of syllabic and morphological awareness in Chinese acquisition is underscored, with some arguing that their role in Chinese acquisition is analogous to that of phonemic awareness in English acquisition (Nagy & Anderson, 1999). Although previous work has highlighted the importance of syllabic awareness (e.g., McBride-Chang & Ho, 2000), the present study considers morphological awareness, focusing on two particular aspects of it, namely, morphological compounding and homophony.

Morphology provides useful aids for supporting the acquisition and retention of polymorphemic words (Sandra, 1994). This applies particularly well to Chinese, which involves extensive lexical compounding. For example, the word 電視(*/din6 si6/*; *television*) is composed of the morphemes 電(*/din6/*; *electric*) and 視(*/si6/*; *vision*), and the word 電腦(*/din6 nou5/*; *computer*) is made up of 電(*/din6/*; *electric*) and 腦(*/nou5/*; *brain*).[1] Hence, meanings of Chinese words can often be derived through simple morphological analysis in the most straightforward fashion (Ku & Anderson, 2003).

A large number of homophonic morphemes constitutes another salient feature of Chinese morphology. For example, in the Cantonese dialect, 4,500 regularly used characters map onto around 1,700 tonal syllables (Liu et al., 1975; Qian, Lee, & Soong, 2004). Hence on average, nearly 3 regularly used characters, each representing a distinct meaning, share 1 tonal syllable. The ability to distinguish characters (morphemes) having identical pronunciations therefore becomes crucial in learning to read.

Why might skills in lexical compounding and resolving homophony facilitate Chinese word recognition? Most Chinese words to be learned early are multimorphemic, underscoring the prominence of morphological awareness in early Chinese acquisition. This contrasts with beginning English reading, in which multimorphemic words are learned relatively late (e.g., McBride-Chang et al., 2005; Shu, McBride-Chang, Wu, & Liu, 2006). The importance of combining morphemes in order to read a variety of words implies that sensitivity to lexical compounding may facili-

[1] Cantonese is transcribed in the Romanization symbols standardized by the Linguistic Society of Hong Kong (in 1993). Numbers indicate lexical tones.

tate early word recognition. For example, in English, knowing the morpheme *house* may help children read more difficult words such as *household*, *funhouse*, or *houseboat*. Knowing one morpheme within the word may help children read the entire word by making use of their extensive oral knowledge and understanding of how morphemes can be combined in the native language. In addition, distinguishing meanings of homophones might also help in mapping oral language onto words. For example, distinguishing *wear* from *where* might help children learn to read words such as *wearing*, *underwear*, *nowhere*, or *whereabouts*, words sharing one sound unit that represents different meanings. Both the processes of lexical compounding and homophone distinction were associated with word recognition in Chinese children in correlational studies (McBride-Chang, Shu, Zhou, Wat, & Wagner, 2003; McBride-Chang et al., 2005; Shu et al., 2006). Our focus on training of lexical compounding and homophone identification was intended to probe the extent to which explicit metalinguistic training in such skills might facilitate early word recognition in Chinese.

A number of training studies have reported associations between morphological awareness and reading ability. For example, Lyster (2002) demonstrated that among Norwegian preschoolers, those who received training in word morphology had associated gains in both morphological skills and reading, in addition to phonological skills, in comparison with those in a control group. Similarly, in a study of 7- and 8-year-old English speakers, those who received 12 weeks of morphological training, focused on prefixes, suffixes, and other derivations, had improved reading skills in comparison with those in a control group (Nunes, Bryant, & Olsson, 2003).

Beyond morphological interventions in alphabetic languages, several studies have established the effects of MT on children's word recognition ability (Nagy et al., 2002). For example, C.-L. Fu and Huang (2000) conducted a study on the effects of MT focused on radical awareness, which is the sensitivity to semantic and phonetic cues provided by the radicals comprising Chinese characters, on Chinese character recognition ability in Taiwanese second-grade lower achievers. C.-L. Fu and Huang found significant main effects of training on morphological awareness and greater intragroup improvement on the character recognition scores in the MT group than in the control group.

Metalinguistic Training

Nevertheless, although studies have demonstrated positive effects of metalinguistic training on early reading acquisition (e.g., Bus & van IJzendoorn, 1999), most of these studies featured training by teachers or specially trained researchers rather than by parents. Previous correlational research has demonstrated that parental reports about reading and writing with their children in kindergarten were uniquely associated with these children's reading skills, both concurrently and longitudinally (Sénéchal & LeFevre, 2002; Sénéchal, LeFevre, Thomas, & Daley, 1998). However, causal evidence of parents' contribution to children's oral and literacy skills remains scant. In addition, for very young children, training in metalinguistic skills alone, without an explicit focus on print, may be useful for promoting reading acquisition. For example, a meta-analysis demonstrated that phonological awareness training itself, in the absence of print, facilitates written word recognition in alphabetic orthographies among young children (Bus & van IJzendoorn, 1999). In the present study, the focus is on parents' training of their children on metalinguistic skills through interactive reading rather than explicit teaching of print concepts as has been done in some previous studies (e.g., Sénéchal et al., 1998; Sénéchal & LeFevre, 2002). Furthermore, the present training is specifically about morphological awareness, a salient feature of Chinese reading acquisition.

The Situation in Hong Kong

Most children in Hong Kong start their formal schooling at 3 years of age, when they enter either a kindergarten or a child care center (Opper, 1996), where they begin to learn to read and write Chinese characters (G. S. Fu, 1987; Li & Rao, 2000). The mainstream approach to early Chinese reading instruction relies heavily on rote memorization, and children are encouraged to learn characters as holistic units (H. Cheung & Ng, 2003). Also, children are required to copy new characters several times to ensure that they can recognize and reproduce them (Chan & Wang, 2003). In general, parents in Hong Kong have positive attitudes toward early literacy instruction and home literacy activities. Li and Rao (2000) found that 73% of the parents taught their children to read Chinese characters at home, and 82.5% of them believed that parent–child reading was useful to develop their child's Chinese literacy skills. Therefore, methods that provide guidance for parents to teach Chinese literacy at home and read effectively with their children are needed.

The Present Study

The present study included four participant groups: the dialogic reading with morphology training (DR + MT), dialogic reading alone (DR), typical reading (TR), and control groups. Demonstration of the unique effect of MT was made possible by this design. There were three hypotheses. First, because past studies had found that typical parent–child reading was related most strongly to children's oral language development, it was expected that the TR condition would produce greater gains in vocabulary than would the control condition.

Second, because of the importance of parent–child interaction as shown in previous DR research, DR was expected to foster gains in vocabulary and interest in reading. Thus, children in the DR and DR + MT conditions were hypothesized to demonstrate greater growth in vocabulary and interest in reading than children in the TR condition.

Third, we hypothesized that children in the DR + MT condition would have larger gains in morphological awareness and, consequently, in character recognition than their counterparts in the other three conditions. This is because previous studies have shown a strong link between morphological awareness and Chinese reading. The exact mechanism underlying this relation has not been formally modeled. One way to look at it is to regard morphological awareness as one precondition for good reading, which involves not only effective character–syllable mapping (achievable by rote learning), but also a general awareness that characters represent independent syllables and meanings that can be flexibly combined and recombined. Such an awareness is especially important in normal reading and some test situations, in which characters are surrounded by other characters. Hence, good mor-

phological awareness might better prepare children for learning what syllables are associated with what characters, which is reading itself.

Method

Participants

One hundred fifty children in Hong Kong of normal intelligence in their 3rd kindergarten year were included. One child in the DR condition and another in the control condition dropped out during the study, and thus our data were from a total of 148 children (attendance rate was 98.67%). Children ranged in age from 57 to 71 months with a mean age of 63.8 months. There were 91 male and 57 female participants. Parents of these children were Cantonese-speaking and had completed at least a primary education. The average family income range per annum, in Hong Kong (HK) dollars, was from HK$480,000 to HK$719,988 (approximately $61,536 to $92,304 in U.S. dollars). Parents reported that on average the children owned between 30 and 49 storybooks and they read books with their parents at least once a week. Parents' self-reported amount of reading time per day averaged around 15 to 29 min.

Measures

Character recognition. A 61-item character recognition list and 150 items adapted from the Hong Kong Test of Specific Learning Difficulties in Reading and Writing (HKT-SpLD; Ho, Chan, Tsang, & Lee, 2000) were combined and administered at both pre- and posttesting. The items were arranged in order of increasing difficulty, and the children were required to read each character aloud. Children were given the items adapted from the HKT-SpLD if they progressed beyond the 61-item character recognition list. Testing stopped when the child failed to read 15 consecutive items. The maximum score of the combined task was 211; Cronbach's alpha was .98.

Vocabulary. The Cantonese receptive vocabulary test, administered at both pre- and posttest, consisted of 30 items from the Hong Kong Cantonese Receptive Vocabulary Test (P. S. P. Cheung, Lee, & Lee, 1997) and 30 additional items translated and adapted from the Peabody Picture Vocabulary Test—Third Edition (PPVT–III; Dunn & Dunn, 1997). The original Hong Kong Cantonese Receptive Vocabulary Test, consisting of 3 training and 65 test items, is modeled on the PPVT and developed for Cantonese-speaking children from 2 to 6 years of age. This test, and the Chinese translation of the PPVT–III as well, have been successfully used among children in Hong Kong in some previous studies (Chow & McBride-Chang, 2003; Fung et al., 2005; McBride-Chang, Cheung, Chow, Chow, & Choi, 2006). The presently used 60 vocabulary items had been selected through a pilot test from 90 initial items drawn from the two respective tests. From this initial pool, 35 items were discarded because they produced over 95% of correct responses.

To administer the vocabulary test, the experimenter read aloud each item, and the child was to select a picture, from four options, to match it. The four optional pictures in each trial corresponded respectively to the target item, an item phonologically close to the target, an item semantically close to the target, and an unrelated item. The maximum score of the vocabulary test was 60; Cronbach's alpha was .75.

Morphological awareness. Two tasks of morphological awareness in the absence of print were administered at both pre- and posttesting. These tasks were morpheme identification and morphological construction.

The morpheme identification task consisted of 4 practice items and 14 test items. For each item, four pictures were presented simultaneously, and each of the four pictures was named out loud by the experimenter. The experimenter then said aloud a two-syllable probe word containing the target morpheme; the child's task was to select the one picture name, out of the four, sharing the same target morpheme as the probe. Of the four picture names, one contained the target morpheme, two contained syllables homophonic with the target morpheme, and one was semantically related to the probe but shared no morpheme or syllable with it. For example, in one test trial, four pictures showing an envelope (信封*/seon3 fung1/*), a petrol station (油站*/jau4 zaam6/*), a post box (郵筒*/jau4 tung2/*), and swimming (游水*/jau4 seoi2/*) were presented. Children were asked to select the picture bearing a name that shared the target morpheme 郵(*/jau4/*) with the probe "stamp" (郵票*/jau4 piu3/*). The correct answer would be "post box" (郵筒*/jau4 tung2/*). Cronbach's alpha for this 14-item task was .50. Items with low reliability were then dropped to improve the overall reliability of this task. Five items were finally selected, and the Cronbach's alpha for this 5-item task was .61.

The morphological construction task consisted of 2 practice items and 20 test items. For each item, the experimenter orally described a novel object or concept; the child was to construct a novel word label to name the new object or concept. Pictures were used to illustrate the new objects or concepts for the 2 practice items and the first 3 test items. One example is the following: "If a spider makes a web, we call it a *spider web* (蜘蛛網*/zi1 zyu1 mong5/*). What would we call a web that is made by an ant?" The answer is an *ant web* (螞蟻網*/maa5 ngai5 mong5/*). Creation of the novel label "ant web" to name the new object (i.e., a web made by an ant) thus required some understanding of the component morphemes "ant" and "web," and also how these morphemes should be legally combined. The maximum score of this task was 20, and its Cronbach's alpha was .81.

Nonverbal IQ. The Raven's Colored Progressive Matrices (RCPM; Raven, Court, & Raven, 1995) was used to measure children's nonverbal IQ at pretesting only. In this study, only sets A and B, with 24 items in total, were used. The maximum score of this task was 24, and its Cronbach's alpha was .63.

Reading interest. A six-item questionnaire was administered to assess children's interest in reading at both pre- and posttesting. The items of this questionnaire were adapted from a questionnaire measuring children's interest in literacy-related episodes; these have been successfully administered to kindergartners in Hong Kong in previous research (Lau & McBride-Chang, 2005). Each of the six items represented a reading-related episode. Items included whether the child enjoyed reading storybooks with his or her (a) mother, (b) teachers, and (c) elder siblings; enjoyed reading books on his or her own; enjoyed going to the library; and felt that he or she was competent in reading books. Children were shown a picture with four different faces being very unhappy, unhappy, happy, and very happy and then asked to differentiate those faces. For each item, the experimenter read out the item, and the child

was to select the face most appropriately describing her own degree of happiness in that particular reading-related episode. If the question was not applicable to the child, a choice of "n/a" was provided. The total score was divided by the number of questions applicable to the child, and this score was used for analysis. The maximum score of this task was 4; Cronbach's alpha was .75.

Storybook identification. This task consisted of 24 pictures of storybook cover pages, half of which were storybooks used in this study (targets), and half of which were not (distracters). To ensure that the distracters looked similar to the targets and that they had not been read by the participating children, distracters were selected from the same series but different level of storybooks as the targets, and these storybooks were all developed and published in mainland China only, so children from Hong Kong had not previously been exposed to them. Children were asked to select from the 24 pictures those they had read before. This task was administered at posttesting only and served as a measure of the number of storybooks read during the 12-week program. Scores were calculated by subtracting the number of distracters chosen from the number of targets chosen. Higher scores reflected the fact that more storybooks used in this study were read, and the maximum score of this task was 12.

Demographic questionnaire. A demographic information questionnaire was distributed to the parents of participating children before the 12-week program. The questionnaire consisted of questions about the participating child's school, class, sex, date of birth, maternal education level, maternal occupation, paternal education level, paternal occupation, family income, and reading resources and practices at home.

Follow-up questionnaire. A follow-up questionnaire for evaluating the 12-week program was distributed to the parents in the DR and the DR + MT conditions after the 12-week program. The purpose of this questionnaire was to collect feedback from parents on the DR and the MT. The questionnaire included questions about whether the parents liked the DR and MT methods and whether they used the DR technique when they read other books with their children.

Conditions

DR. Each participant was provided with a total of 12 books with hints for prompt questions added in each book and a guideline that included information about the DR technique. Books used in the present study included a lot of pictures and did not rely heavily on the written text. The fundamental reading technique in DR is the PEER sequence in parent–child reading: The parent *prompts* the child to say something about the storybook, *evaluates* the child's response, *expands* the child's responses by rephrasing and adding information, and *repeats* the prompt to ensure the child has learned from the expansion. There are five types of prompts, including completion, recall, open-ended, wh-, and distancing prompts, used in the DR technique.

DR with MT. Based on the research evidence on the possibility of combining DR and metalinguistic teaching, and the importance of morphological awareness for Chinese literacy, the present study added a MT component to the DR method in one experimental condition. We used the DR materials to teach morphology.

The materials provided to this group were the same as those given to the DR group, except MT materials and techniques were added. A MT guideline, and morphological construction and homophone training books, were provided at the beginning of the program together with the DR materials. The MT guideline includes information about the morphology in the Chinese language and techniques to enhance children's awareness of morphology. The MT in this study did not explicitly target teaching print. Rather, it involved a focus on sound and meaning training. For parents to use the materials and technique used in DR to teach morphology, the content of the MT materials corresponded to the book they read that week. Thus, there were corresponding MT items for each storybook used in DR. Parents were expected to read with their child using DR and then to teach him or her morphological awareness with the MT books. Items used in MT were different from the testing items of the morpheme identification and the morphological construction tasks.

Morphological construction training focused on increasing children's awareness of the morphosyllabic properties of Chinese and identifying morphemes in pairs or groups of several words. For instance, in one of the items of the morphological construction training, the story they read showed a farmer pulling a "carrot king" (蘿蔔王 */lo4 baak6 wong4/*) from the ground. Corresponding to this story, the target item was "carrot king" (蘿蔔王 */lo4 baak6 wong4/*), and the morphological construction training materials included pictures of a big watermelon and a big ice cream. Parents were first required to explain to their child that a "carrot king" (蘿蔔王 */lo4 baak6 wong4/*) represented a big carrot. With the aid of the picture, parents were then required to explain to their child that a "watermelon king" (西瓜王 */sai1gwaa1 wong4/*) represented a big watermelon. After that, the child was asked to compose a word or phrase meaning a big ice cream (i.e., "ice-cream king" (雪糕王 */syut3 gou1wong4/*). All items are available from the authors upon request. There were 53 items in total, 4.5 items for each story on average, for the morphological construction training.

Homophone training focused on sensitizing children's awareness that the same syllable might represent different meanings. For instance, in one of the items of the homophone training, the story they read showed a little sheep looking for its mother. Corresponding to this story, the target item was the little sheep (小羊 */siu2 joeng4/*), and the target syllable was *joeng4*. The homophone training materials included pictures of the sun (太陽 */taai3 joeng4/*) and the sea (海洋 */hoi2 joeng4/*). Parents were required to label the little sheep (小羊 */siu2 joeng4/*), the sun (太陽 */taai3 joeng4/*), and the sea (海洋 */hoi2 joeng4/*) corresponding to the pictures in the storybook and the training book. The child was then asked to select the picture that corresponded to the meanings of the wool (羊毛 */joeng4 mou4/*) and the sunlight (陽光 */joeng4 gwong1/*), and the answers would be the sheep (小羊 */siu2 joeng4/*) and the sun (太陽 */taai3 joeng4/*), respectively. All story items are available from the authors upon request. There were 67 items in total, 5.6 items for each story on average, for the homophone training.

TR. Participants were provided with 12 books that were the same as those used in the DR and the DR + MT conditions before the program. However, no hints were added in the books. Parents were requested to read to their children as they normally would.

Control. No books were initially provided, and parents were expected to rely on their regular literacy habits with their children

during the 12-week program. After the posttesting, a set of 12 books was given to the participants with a full debriefing as to the nature of the study.

Procedure

After informed consent had been obtained from parents, the parents were given a demographic information questionnaire. The children were pretested in two 30-min sessions in their school by trained psychology major undergraduates and postgraduates who were blind to the group placements. The children were administered the RCPM (Raven et al., 1995), the Chinese character recognition task, the Cantonese receptive vocabulary test, the morpheme identification task, the morphological construction task, and the children's questionnaire on reading interest. Children were assigned randomly to one of the four conditions, the DR + MT, DR, TR, and control conditions.

Materials were then distributed to the parents of the DR + MT, DR, and TR groups. A 1-hr training session was held separately for the parents of the DR + MT and the DR groups before the reading intervention started in the schools. As this study focused on how parents' language and literacy instruction methods at home affect children's language and literacy acquisition, the training sessions focused on the training of parents rather than on children. In the training session for the DR group, parents were trained to use DR and to use the materials for DR through live instruction and demonstration conducted by Bonnie Wing-Yin Chow. The training session for the DR + MT group was similar to that for the DR group, except that, in addition, parents were trained to use MT strategies and to use the materials for MT. The time spent for the DR instruction and the demonstration for the DR and the DR + MT groups was equivalent. The training sessions for the DR and the DR + MT groups had been designed to be equivalent in duration by allowing parents in the DR group to have a longer question-and-answer session. The guidelines distributed to these two groups contained major points of the techniques given in the training sessions and additional examples to illustrate the use of the techniques.

The parent–child reading program was conducted for 12 weeks. Parents in the DR and the TR conditions were encouraged to read each book twice in a week for 20 min each time with their children. Parents in the DR + MT condition were encouraged to read each book, including MT, twice in a week for 20 min each time with their children, identical to the encouragement given the DR and the TR groups. During the 12-week intervention, parents of the DR + MT, the DR, and the TR groups were contacted over the phone on a fortnightly basis to remind them to read the books with their children and to find out whether they encountered any problems.

Children were then immediately posttested on the tasks by way of the same measurements used in pretesting, except the RCPM was not administered after the program. The storybook identification task was also administered. A follow-up questionnaire was distributed to the parents of the DR + MT and the DR conditions, and the storybooks were given to the parents of the control group after the posttesting of their children. Following completion of this study, training sessions were held for all participating parents on the DR and MT techniques.

Results

Pretest Measures

To ensure the sampling was unbiased, separate ANOVAs were conducted to compare the demographic information and home literacy resources and practices among the four conditions. One hundred twenty-four demographic questionnaires were collected from participating parents successfully (35 from parents in the DR + MT condition; 29 from parents in the DR condition; 31 from parents in the TR condition; and 29 from parents in the control condition). Participants in the four conditions did not differ significantly on any of these demographic and home literacy measures, including chronological age, sex, maternal educational level, paternal educational level, family income, number of books owned by children, frequency of parent–child reading, and parents' daily reading habits (all $ps > .05$). The descriptive statistics on demographics and home literacy resources and practices are presented in Table 1. Another ANOVA was used to compare scores on the RCPM among the groups to test for factors that might affect the children's language and literacy standard as well as their capacity for improvement. No significant difference was found ($p > .05$). The descriptive statistics for the RCPM scores are presented in Table 2. Accordingly, these pretest measures were not included in further analyses.

Five separate ANOVAs were conducted to compare pretest scores among the four groups on the tasks of Chinese character recognition, Cantonese receptive vocabulary, morpheme identification, morphological construction, and reading interest, to ensure that any group differences were not due to biased sampling, and the descriptive statistics for each task are presented in Table 2. Because the five measures were tapping children's performance in different domains, we tested them as five separate hypotheses with separate ANOVAs rather than treating them as indicators of one common construct. No significant differences were found on the pretest scores of these tasks among the four groups (all $ps > .05$).

Storybook Identification

The descriptive statistics for the storybook identification scores are presented in Table 2. There were 19 distracter items in total selected by all participating children. Children in the control group, who had not read any of the books included in this task, scored near zero on average, indicating that this task distinguished children who had and had not read the storybooks. Children in the DR + MT, DR, and TR conditions scored from 10 to 11 on average, suggesting that children in these conditions had read most of the books during the 12-week reading program.

Group Improvement

Five separate repeated measures analyses were performed on the tasks of Chinese character recognition, Cantonese receptive vocabulary, morpheme identification, morphological construction, and reading interest, to compare improvement across groups before and after the 12-week program. The descriptive statistics for the pretest and posttest scores on each task are presented in Table 2. Significant interaction effects were found for the Chinese character recognition task, $F(3, 144) = 2.94$, $p < .05$; the Cantonese receptive vocabulary test, $F(3, 144) = 2.77$, $p < .05$; the mor-

Table 1
Descriptive Statistics on the Demographic Measures

Characteristic and condition	*N*	*M*	*SD*	Male	Female
Chronological age (in months)					
DR + MT	38	64.82	3.74		
DR	37	63.11	4.07		
TR	37	63.32	3.59		
Control	36	63.92	4.00		
Total	148	63.80	3.87		
Maternal education					
DR + MT	36	3.06	1.01		
DR	29	3.17	1.14		
TR	32	2.75	.98		
Control	30	2.93	.94		
Total	127	2.98	1.02		
Paternal education					
DR + MT	36	3.33	1.01		
DR	30	3.47	1.04		
TR	31	3.13	1.02		
Control	30	3.10	1.03		
Total	127	3.26	1.03		
Family income					
DR + MT	35	4.77	1.03		
DR	30	4.87	1.04		
TR	31	4.48	1.03		
Control	29	4.86	.92		
Total	125	4.74	1.01		
Number of storybooks					
DR + MT	36	4.11	.82		
DR	29	3.79	.94		
TR	32	3.78	1.01		
Control	30	3.73	.87		
Total	127	3.87	.91		
Frequency of parent-child reading					
DR + MT	36	4.64	.72		
DR	30	4.80	.61		
TR	32	4.75	.44		
Control	30	4.50	.97		
Total	128	4.67	.71		
Parents' daily reading habits					
DR + MT	36	3.28	.82		
DR	30	3.33	.92		
TR	32	3.38	.79		
Control	30	3.10	1.00		
Total	128	3.27	.88		
Gender					
DR + MT				23	15
DR				23	14
TR				23	14
Control				22	14
Total				91	57

Note. The maternal and paternal educational levels were entered as follows: 1 = primary, 2 = secondary, 3 = preparatory, 4 = college, and 5 = postgraduate. The family income per month was entered in Hong Kong (HK) dollars as follows: 1 = <HK$5,000 ($641 in U.S. dollars), 2 = HK$5,000–$9,999 ($641–$1,282 in U.S. dollars), 3 = HK$10,000–$19,999 ($1,282–$2,564 in U.S. dollars), 4 = HK$20,000–$39,999 ($2,564–$5,128 in U.S. dollars), 5 = HK$40,000–$59,999 ($5,128–$7,692 in U.S. dollars), and 6 = ≥HK$60,000 ($7,692 in U.S. dollars). The number of storybooks was entered as follows: 1 = none, 2 = <10, 3 = 10–29, 4 = 30–49, and 5 = ≥50. Frequency of parent-child reading was entered as follows: 1 = none, 2 = <10 times in a year, 3 = once a month, 4 = once a week, and 5 = >1 time in a week. Parent's daily reading habits were entered as follows: 1 = none, 2 = 0–14 min, 3 = 15–29 min, 4 = 30–59 min, 5 = 1–2 hr, and 6 = >2 hr. DR = dialogic reading; MT = morphology training; TR = typical reading.

Table 2
Descriptive Statistics on the Tasks Administered at Pretesting and Posttesting

	Pretest		Posttest	
Task of condition	*M*	*SD*	*M*	*SD*
Chinese character recognition				
DR + MT	52.45	27.54	67.11	27.64
DR	50.86	26.49	60.89	26.98
TR	50.00	25.97	60.22	26.36
Control	50.19	25.47	60.08	29.27
Cantonese receptive vocabulary				
DR + MT	37.39	6.84	41.37	7.05
DR	36.19	5.59	41.19	5.60
TR	36.41	5.93	38.86	5.07
Control	37.19	6.73	38.75	6.47
Morpheme identification				
DR + MT	2.79	1.70	3.26	1.18
DR	3.35	1.57	3.35	1.27
TR	3.46	1.19	2.81	1.31
Control	3.11	1.45	2.89	1.25
Morphological construction				
DR + MT	8.97	3.55	11.45	3.81
DR	8.86	4.20	11.57	3.56
TR	8.08	3.80	10.03	3.51
Control	8.36	4.16	11.72	3.51
Children's questionnaire on reading interest				
DR + MT	3.30	.43	3.46	.38
DR	3.26	.58	3.42	.45
TR	3.44	.41	3.36	.47
Control	3.37	.51	3.23	.54
Raven's Colored Progressive Matrices				
DR + MT	13.18	3.11	–	–
DR	13.28	2.81	–	–
TR	12.57	2.51	–	–
Control	12.61	2.97	–	–
Storybook identification				
DR + MT	–	–	10.97	2.33
DR	–	–	10.35	2.32
TR	–	–	11.00	1.63
Control	–	–	.47	1.18

Note. $N = 148$ (38 for DR + MT; 37 for DR; 37 for TR; 36 for control). Dashes indicate that data were not applicable for both the Storybook identification task at pretest and the Raven's Colored Progressive Matrices task at posttest. DR = dialogic reading; MT = morphology training; TR = typical reading.

pheme identification task, $F(3, 144) = 3.10$, $p < .05$; and the children's questionnaire on reading interest, $F(3, 144) = 2.81$, $p < .05$, indicating different conditions yielded different degrees of changes in scores. Interaction effects were not significant for the morphological construction task ($p > .05$).

To investigate which conditions yielded greater improvement, difference scores of these tasks were calculated by subtracting the posttest scores from the pretest scores for each group. Separate ANOVAs and least significant difference (LSD) post hoc tests were conducted on the difference scores of each task. Also, in order to further investigate the effectiveness of the intervention, a Cohen's *d* was conducted to determine the effect sizes for all significant and marginally significant findings. Cohen's *d* was calculated by dividing the difference between the posttest score of the intervention group and that of the reference group by the root mean square of the standard deviation for these groups (Cohen,

1988). Cohen's *d*s equal to .2, .5, and .8 represent a small, medium, and large effect, respectively (Cohen, 1988). The typical effect size in published reports of educational and psychological interventions is about .33 (Cohen, 1977; Sedlmeier & Gigerenzer, 1989).

Significant differences were found for the Chinese character recognition task, $F(3, 144) = 2.78$, $p < .05$, and LSD post hoc tests showed significant differences between the DR + MT group and the other three groups (contrast estimates were 4.63 for the DR + MT and DR groups, 4.47 for the DR + MT and TR groups, and 4.77 for the DR + MT and control groups; *p*s $< .05$). Other group differences were not significant (all *p*s $> .05$). Cohen's *d* for the DR + MT and the DR groups was .68, for the DR + MT and the TR groups was .56, and for the DR + MT and the control groups was .52. Effect size indices showed medium effects of the DR + MT condition on Chinese reading ability.

Significant differences were found for the Cantonese receptive vocabulary test, $F(3, 144) = 2.77$, $p < .05$, and LSD post hoc tests indicated significant differences between the DR and the TR conditions (contrast estimate was 2.54; $p < .05$) and between the DR and the control conditions (contrast estimate was 3.44; $p < .05$). The difference between the DR + MT and the control conditions was not significant (contrast estimate was 2.42; $p < .06$). Other group differences were not significant (all *p*s $> .05$). Cohen's *d* for the DR + MT and the control groups was .43, for the DR and TR groups was .49, and for the DR and the control groups was .59. Effect size indices showed medium effects of the DR + MT and DR training on Cantonese receptive vocabulary ability.

Significant differences were found for the morpheme identification task, $F(3, 144) = 3.10$, $p < .05$, and LSD post hoc tests indicated significant differences between the DR + MT and the TR conditions (contrast estimate was 1.12; $p < .05$). The difference between the DR + MT and the control conditions was not significant (contrast estimate was .70; $p < .07$). Other group differences were not significant (all *p*s $> .05$). Cohen's *d* for the DR + MT and TR groups was .69, and for the DR + MT and control groups was .50. Effect size indices showed medium effects of the DR + MT condition on morpheme identification skill. The TR and the control conditions showed decreases over time, which might be attributable to random variation of performance, and these difference scores were allowed to be negative, rather than being reset to zero, to reflect the actual performance of the children.

Significant differences were found among the children's questionnaire responses on reading interest as well, $F(3, 144) = 2.81$, $p < .05$, and LSD post hoc tests indicated significant differences between the DR + MT and the control conditions (contrast estimate was .29; $p < .05$) and between the DR and the control conditions (contrast estimate was .30; $p < .05$). The difference between the DR and the TR conditions was not significant (contrast estimate was .24; $p < .07$). Other group differences were not significant (all *p*s $> .05$). Cohen's *d* for the DR + MT and the control groups was .62, for the DR and the TR groups was .44, and for the DR and the control groups was .55. Effect size indices showed medium effects of the DR + MT and the DR conditions on reading interest.

Follow-Up Questionnaire

Seventy percent (26/37) of the parents of the DR group and 84% (32/38) of the parents of the DR + MT group returned the follow-up questionnaire. Eighty-one percent of the parents reported that they liked DR, and no parents disliked it. Eighty-four percent of the parents used the DR techniques when they read storybooks other than those used in the present study with their children. Eighty-two percent of the parents of the DR + MT group reported that they liked the MT, whereas 6% of parents disliked it. The parents who disliked the MT expressed concerns about whether their child might learn uncommon phraseology through morphological construction training. They believed that these unusual phrases would hinder their children's oral expression and language development.

Discussion

The present study investigated the effectiveness of the DR method, and a combination of the DR method and MT, on facilitating children's language and literacy skills, morphological awareness, and interest in reading. In comparison with the typical reading (TR) and control groups, the DR group attained higher vocabulary knowledge over the 12-week study, underscoring the importance of parent–child reading for general oral language skills. In contrast, in comparison with the three other groups included, the DR + MT group improved significantly more in Chinese character recognition, suggesting that parents' explicit metalinguistic instruction may better prepare children for learning to read. Both interventions yielded enhanced reading interest compared to the control condition. These findings are discussed in more detail below.

The findings of the present study demonstrated that the DR intervention fostered gains in children's receptive vocabulary and reading interest. The positive impact of DR on children's receptive vocabulary growth has been widely demonstrated in past studies (e.g., Lim, 1999; Valdez-Menchaca & Whitehurst, 1992), and the findings of the present study have further supported the effectiveness of DR in enhancing receptive vocabulary growth among Chinese children (Chow & McBride-Chang, 2003; Fung et al., 2005). The results of enhanced interest in reading through DR are also in line with those of Ortiz et al. (2001).

However, the DR condition did not yield greater gains in character recognition ability in the present study. One reason for this is that the principle focus of DR is on facilitating children's oral language skills through parent-child interaction (Whitehurst et al., 1988) and the DR technique does not emphasize teaching or discussion about print. Children in the DR condition also did not show greater improvement in morphological awareness. Previous studies have suggested that oral scaffolding does not affect metalinguistic awareness development. For example, Fey et al. (1994) found that after a 10-month intervention of oral scaffolding of specific syntactic forms, preschoolers in the intervention group showed greater improvement on syntactic but not phonological skills.

In contrast, the DR with MT intervention, which focused both on metalinguistic training and oral language, yielded greater growth in character recognition ability and a trend toward greater improvement on receptive vocabulary. Also, this intervention fos-

tered gains in children's reading interest compared to the control condition. The enhanced performance of character recognition in the DR with MT condition over the DR group suggested that MT was effective in enhancing children's skills in learning to read, probably by promoting an awareness of lexical morphemes, which are written as characters and phonologically realized as syllables. This awareness provides a precondition for children's further acquisition of character–syllable mapping. Hence, the effect of morphological training on character recognition is believed to be indirect; morphological awareness prepares the child for efficient learning in print–sound mapping.

These findings of facilitated reading ability through MT that does not focus on the teaching of print are consistent with those of past MT studies (e.g., C.-L. Fu & Huang, 2000; Nagy et al., 2002) and correlational studies on morphological awareness tasks that did not involve the testing of print (e.g., the morpheme identification and the morphological construction tasks used in this study) and Chinese character recognition ability (e.g., McBride-Chang et al., 2003, 2005). Such findings are also in line with previous studies demonstrating that phonological awareness training, without an explicit focus on print, facilitates greater word recognition in children learning to read alphabetic scripts (e.g., Bus & van IJzendoorn, 1999). Thus, the present study represented a substantial extension of this work because it probed into whether, if greater morphological awareness tends to be associated with enhanced character recognition in correlational studies, training in morphological awareness could also enhance reading, which is parallel to results demonstrated in previous studies of phonological awareness and word recognition in English and other alphabetic languages. Furthermore, it is noteworthy that the DR with MT intervention could foster children's character recognition ability without sacrificing their interest in reading.

Children in the DR with MT condition, in comparison with the children in the TR condition, had larger gains in homophone awareness tapped by the morpheme identification task. The children in the DR with MT condition also showed a trend toward greater improvement in homophone awareness than the children in the control condition. Though the DR with MT group did not show greater improvement in homophone awareness than the DR group, they showed enhanced performance in homophone awareness than did the TR group, and the performance did not differ between the DR and the TR conditions. These findings partially demonstrate the effectiveness of explicit instruction in metalinguistic skills in young children. MT may facilitate children's reading abilities in at least three ways. First, as discussed, it facilitates children's morphological awareness, and this might in turn promote children's Chinese character recognition abilities, by promoting the understanding that morphemes are flexibly combined into larger units and that they are written as characters and phonologically realized as syllables. Second, instruction might have changed parents' literacy instruction behaviors toward the children, thus fostering their capabilities of learning Chinese characters both at home and in school. Hence, this amounts to modification of parental attitude and instructional strategies, which might result in relatively long-term changes in children's learning behavior. Third, morphological instruction may have consolidated the associations that the children had learned in their preschool. These three possibilities all point to an indirect effect of MT on the development of character reading.

This situation is in some ways analogous to the relation between phonological awareness and word reading/letter recognition in alphabetic languages. Phonological awareness fine-tunes the child's sensitivity to small units of sounds, which are directly expressed in the alphabetic system as letters or strings of letters. Hence, children having good phonological awareness are better able to recognize or sound out individual letters or sequences of letters (i.e., words as written in the alphabetic system). In the present situation, morphological awareness fine-tunes the child's sensitivity to small units of meaning, which are directly expressed in logographic Chinese as characters (i.e., lexical morphemes as written in the logographic system). Therefore, children having good morphological awareness, because of MT, are better able to recognize and read aloud individual characters. In this sense, the present impact of morphological awareness on character recognition is an observation in parallel with the effect of phonological awareness on letter and word recognition in the alphabetic system. The fundamental distinction has to do with whether the basic units of writing are there to represent sound (alphabetic) or meaning (logographic).

Furthermore, enhanced homophone sensitivity could help children map oral syllables onto printed words and become more aware of the morphosyllabic nature of Chinese. When they understand the concept that the same syllable might have different meanings, children might apply this concept for reading characters. This understanding may be particularly useful when they encounter visually distinct characters with the same pronunciation, a relatively common occurrence in Chinese. In this study, only children with MT improved on the morpheme identification task across pre- and posttesting (children in the other conditions showed steady or decreased performance on this task), indicating that explicit instruction fosters homophone sensitivity. Thus, the findings of this study suggest that explicit instruction to promote homophone awareness might be useful, both at home and in school, for promoting early literacy development in Chinese.

Unlike the morpheme identification task, there was notable improvement on the performance of the morphological construction task across the pre- and posttest in all groups, though the performance did not significantly differ across groups. This is noteworthy because it suggests that children gain in lexical compounding skills through ordinary usage of language or literacy, regardless of whether such skills are explicitly trained or not. Thus, MT may tend to be more effective in fostering children's homophone sensitivity than in fostering their lexical compounding ability. In other words, these two aspects of morphological awareness might have different developmental trajectories, being sensitive to different environmental and instructional factors. We speculate that morphological awareness is a nonunitary, multiaspectual construct, similar to the way phonological awareness has been conceptualized. For instance, Yopp (1988) has demonstrated that different phonological awareness tasks tap different component abilities underlying the umbrella notion of phonological awareness. These abilities are differentially associated with some well-known correlates of phonological awareness, such as reading. A similar idea can be extended to morphological awareness. Further studies are thus required to compare the developmental paths of homophone sensitivity and lexical compounding, and also to recognize the relative contributions of training to each of these aspects.

In the present study, MT did not further enhance children's receptive vocabulary gains when it was combined with DR. This result might be attributable to the fact that less time was spent on DR in this condition. Whitehurst, Epstein, et al. (1994) noted that the more parents read dialogically to their children at home, the more gains their children made in their language abilities. During the 12-week program, all parents, except those in the control group, were encouraged to engage in our prescribed literacy activities with their child twice per week for 20 min each time. Although participants in the DR condition were expected to spend 20 min each time reading using the DR method, participants in the DR + MT condition might have spent fewer than 20 min each time reading with the DR method because they spent part of the prescribed 20-min period engaged in MT. Further studies can investigate the impact of the duration of DR or of MT on children's language development.

In this study, children in the TR condition did not show significantly greater improvement across all tasks administered, in comparison with those in the control group. These findings indicate that typical parent–child reading may not fully exploit the potential of parent–child reading in promoting children's literacy and language growth and highlight the importance of interaction during the reading process.

Theoretically, these results support a distinction between oral language and metalinguistic activities in promoting early language and literacy. Interactive parent–child reading is ideal in fostering vocabulary growth in young children. In contrast, parents' explicit teaching of metalinguistic skills may be particularly effective for promoting Chinese character acquisition. Future studies might further exploit this distinction by training metalinguistic skills in two ways, one without teaching print knowledge and the other with print as an explicit component of the training. Previous research on alphabetic orthographies has demonstrated that metalinguistic (phonological) training with print tends to promote even better word recognition skills than does such training in the absence of print (e.g., Schneider, Roth, & Ennemoser, 2000). Also, these results show that the ways in which parents read and interact with their children could influence children's interest in reading.

The present study has several practical implications. First, this study provides effective methods to promote children's literacy and language skills, as well as reading interest in a relatively short period of time. The 12-week intervention produced significant gains in children's literacy, language, and reading interest. Second, the present study provides methods to facilitate parent–child interaction and to include linguistic instruction in Chinese family literacy activities. Participating parents had no difficulties successfully using DR and MT at home. Third, parents with no background in psychology or linguistics can learn and use these techniques easily. This is particularly important because parental involvement is an essential component of children's knowledge and skill acquisition. Fourth, and last, training parents to handle the DR and MT techniques is cost- and time-efficient. A 1-hr training session and copies of the guidelines were effective to train parents to use the techniques at home.

There were some limitations of this study. Children's storybook identification was used as an indicator of the implementation of the intervention during the 12-week program in this study. Although this is a cost- and time-efficient method, it is a relatively indirect method to measure parents' compliance. It is recommended that a more direct measure of parents' compliance to the program, such as audiotaping or videotaping of the reading session, can be included in future studies. Also, the morpheme identification task had a relatively low reliability. Therefore, readers should be cautious when interpreting the results of this task. One goal of our future work is to create a more reliable measure of homophone awareness.

Also, we investigated the effects of the intervention on receptive vocabulary and character recognition abilities as proxies of oral language and literacy, respectively. Though many previous DR studies have tested expressive vocabulary, receptive vocabulary was included in this study because the children were relatively young and our best measure of Cantonese vocabulary knowledge for this age range was a receptive measure. Further research can include a broader array of oral language and literacy skills, such as expressive vocabulary, oral fluency, and comprehension, to provide a full picture of the impacts of DR and MT on children's language and literacy development.

In addition, although positive outcomes on children's literacy and language skills and their interest in reading were indicated, the specific components of DR and the relative contributions of the morphological construction and homophone training that facilitated language and literacy skills were not identified. Specific components of DR, such as parents' modified behavior, parents' specific types of questioning, and children's increased responsiveness, might be particularly important for the success of DR. Investigating the underlying mechanism of DR is a promising area of future research. Further studies should also be conducted to investigate the relative importance of morphological construction and homophone training for children's literacy development. This was among the first studies of its kind to explore the effects of very early metalinguistic training on Chinese character acquisition. In future work, we will disentangle the possible influences of lexical compounding knowledge and homophone awareness for reading skills.

Finally, the DR method was used in the present study to foster Chinese literacy and language development among children in Hong Kong. In Hong Kong, Cantonese pronunciation of the character is used when it is read aloud, but Modern Standard Chinese is used when it is read or written (H. Cheung & Ng, 2003). Therefore, for children from Hong Kong, their written Chinese does not directly correspond to their spoken Cantonese. As DR was originally developed for English-speaking children whose spoken and written language is more directly matched, the effects of DR on Chinese literacy growth might be relatively small among children in Hong Kong. Therefore, it is recommended that a component of teaching the pronunciation and the meaning of written forms can be added to the DR method for children in Hong Kong or for other children whose spoken language does not directly correspond to the written one. For instance, parents can label the words in formal Chinese (e.g., 小孩 [*/siu2 hoi4/*; a child]) and explicitly explain that the words (e.g., 小孩 [*/siu2 hoi4/*; a child]) in written Chinese correspond to more colloquial counterparts (e.g., 細路 [*/sai3 lou6/*; a child]) in spoken Cantonese.

Conclusion

To summarize, the present study has successfully demonstrated that DR is an effective method in facilitating children's receptive

vocabulary development and interest in reading. In addition, this experiment demonstrated the effectiveness of an MT program conducted by parents for promoting children's ability to read Chinese characters. The findings in the present study support causal relations between home literacy activities and children's language and literacy acquisition and highlight the importance of parent–child interaction at different levels. These results also underscore the importance of distinguishing general oral parent–child interactions from explicit metalinguistic teaching for understanding the developmental trajectories of early language and literacy.

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