

Effectiveness of Morphological Instructions and Shared Book Reading on Chinese Literacy Development in Children with Dyslexia: A Single-subject Experiment

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Abstract

Existing research have reported the effectiveness of Shared Book Reading approach and Morphological Instructions in Chinese literacy in children with and without reading difficulties in China and Hong Kong. In a different context, such as Chinese language in Malaysia and with children diagnosed with dyslexia, effectiveness of Shared Book Reading and Morphological Instructions on Chinese literacy have not been examined yet. In 2010, Wang and Anderson designed a Chinese literacy intervention of Shared Book Reading approach and Morphological Instructions for a Chinese first grader diagnosed with dyslexia with proven effectiveness. The present study investigated the effectiveness of Shared Book Reading approach and Morphological Instructions on Chinese literacy development of children with dyslexia in Malaysia by adapted the Chinese literacy intervention by Wang and Anderson with Malaysian national curriculum for the Chinese language. A 7-year-old Chinese first grader diagnosed with dyslexia was recruited to participate in the present study. The present study employed single-subject experimental design, i.e. A (Baseline 1) - B (Morphological Instructions) - C (Shared Book Reading and Morphological Instructions) - A (Baseline 2) within-subject design. The results suggested that Shared Book Reading approach and Morphological Instructions were effective methods to improve Chinese literacy development in Chinese children with dyslexia. However, the effectiveness of Morphological Instructions would only be significant when it was utilized as a reading strategy along with the implementation of Shared Book Reading. Limitations and implications of the study are discussed.

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Keywords: Chinese literacy; Dyslexia; Morphological Instruction; Shared Book Reading

INTRODUCTION

Children with dyslexia face difficulties in decoding and reading languages. Given the latest prevalence rate of dyslexia in Malaysia, which is one in 20 children, there is a pressing need for intervention for dyslexia in Malaysia (Chong, 2017). In Malaysia, children must learn more than one language in schools, i.e. Malay and English in government schools. There are also governmental ethnic schools, such as Chinese and Tamil schools, where students must learn Chinese or Tamil on top of the compulsory Malay and English. Children with dyslexia face vast challenges when learning to master more than one language in schools. This study focus on dyslexia in Chinese language in Malaysia.

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Existing research for dyslexia in Chinese language has been conducted in Hong Kong and Singapore contexts. Dyslexia research in alphabetical language, i.e. the English language, has extensive literature across the world over the past century (Chua, 2015; Hebert, Kearns, Hayes, Bazis, & Cooper, 2018; Indrarathne, 2019; Leseyane, Mandende, Makgato, & Cekiso, 2018; Loo & Md Nor, 2019; Tonelli, 2017; Yeo & Lim, 2019). Compared to dyslexia research in English language, dyslexia research in Chinese language is scarce (McBride, Wang, & Cheang, 2018), and there is no dyslexia research in Chinese language conducted in the Malaysian context.

To help Malaysian children with dyslexia learn Chinese, this study aims to replicate the effect of Morphological Instructions (MI) and Shared Book Reading (SBR) found in the case study by Wang and Anderson (2010) with Single Subject Experimental Design. This study examines the effectiveness of two literacy approaches: (i) MI and (ii) SBR, on Chinese literacy development in Malaysian children with dyslexia. McBride (2015) noted that, as all languages distinct differently (i.e. their structure), dyslexia manifests differently in all languages. Hence, to understand the acquisition of Chinese literacy in children with dyslexia, the Chinese language system, the definition of dyslexia, and cognitive profiles of children with dyslexia in different languages will be discussed.

LITERATURE REVIEW

2.1 The Chinese Language System

The Chinese language is frequently regarded as a morpho-syllabic writing system (Ho, Yau, & Au, 2003; Lin, Sun, & McBride, 2018; Wang & Anderson, 2010). Majority of the Chinese characters represent morphemes (basic unit for meaning), and each morpheme signifies a spoken Chinese syllable. The basic graphic unit in the system of Chinese language is a character (Ho et al., 2003). Majority of the Chinese characters are ideo-phonetic compounds, where each constitutes a semantic component (the semantic radical) and a phonological component (the phonetic radical) (Lin et al., 2018; Wong, 2017). For instance, in the character 妈 [ma]1 “mother”, 女 [nü]3 “female” is the semantic radical which gives a cue to the meaning of the character (as mother is a female person), and 马 [ma]3 “horse” is the phonetic radical that gives a cue to the pronunciation of the compound. There are 214 semantic radicals and 800 phonetic radicals in the Chinese language (Teng & Yamada, 2017; Taylor & Taylor, 1983).

In Chinese characters, only the phonetic radical encodes or specifies the sound of the character, which is termed orthography-phonology correspondence rule or phonetic principle (Anderson et al., 2003; Ho & Bryant, 1997; Li, Li, & Wang, 2019; Yin & McBride, 2015; 2018). The reader could derive the sound of the character directly from the sound of the phonetic radical (e.g. deriving the sound of the character 蚂 [ma]3 “ant” from the sound of its phonetic radical 马 [ma]3; Ho et al., 2003). Hence, readers’ sensitivity towards orthographic structures and radicals is a key factor for Chinese literacy acquisition (Chung et al., 2011; Wong, 2017; Yin & McBride, 2015; 2018). Readers with specific learning disorder, such as dyslexia, might have difficulties in developing sensitivity required for decoding the orthographic structures and radicals in Chinese literacy.

2.2 Understanding Dyslexia

In the Diagnostic and Statistical Manual of Mental Disorders (DSM-V), dyslexia is classified under ‘Specific Learning Disorder’, termed as a pattern of learning difficulties, among impairment in reading, written expression, and mathematics (American Psychiatric Association (APA), 2013). Individuals with dyslexia has learning difficulties such as problems with recognizing words accurately or fluently, decoding and spelling words poorly (APA, 2013). Up to 2017, the prevalence rate of dyslexia was approximately 5% among on-going school children in Malaysia (Chong, 2017). With such a high number of schooling children who has dyslexia, developing interventions that could address the cognitive and psychological challenges in

literacy development faced by these group of children is imminent to the educators in Malaysia. To develop an effective intervention, the cognitive profiles of dyslexia in different languages should be understood.

2.2.1 *Dyslexia in Alphabetic Languages*

One of the most widely used alphabetic languages is English. Large number of researches have been focusing on understanding the cognitive profiles and learning process of children with dyslexia with the English language (Chua, 2015; Hebert et al., 2018; Indrarathne, 2019; Leseayne et al., 2018; Reid, 2009; Tonelli, 2017; Yeo & Lim, 2019). Important skills for literacy acquisition of English in children include phonological skills, morphological awareness (MA), prior reading level, vocabulary knowledge, and general intelligence (Wu et al., 2009).

Children with dyslexia commonly face various deficits in English literacy acquisition skills. The primary deficit of dyslexia in English is phonological processing (Snowling, 2000). Deficits in phonological processing affects how individuals process speech sounds in a word, such as difficulty in acquiring letter-sound correspondences and inability to “decode” unfamiliar words in a text (Spafford & Grosser, 2005; Snowling, 2000). Secondary deficit in dyslexia is deficient speeded processing (McBride-Chang & Manis, 1996). Impaired speeded processing may interfere with automatic processing that bounds orthographic pattern extraction in a language (Bowers & Wolf, 1993). Another core deficit in readers with dyslexia is visual-orthographic knowledge, such as MA (i.e. sensitivity to morphemes in words) (Leong, 1999; Carlisle, 1995). Learners who are lacking in MA have difficulties with manipulating structures of words, encoding printed words, and analysing meaning of words that could be morphologically complex (Carlisle, 1995).

2.2.2 *Dyslexia in Chinese Language*

Existing researches indicated multiple underlying deficits in the cognitive linguistic skills in Chinese children with dyslexia: rapid naming, MA, phonological awareness (PA), visual-orthographic knowledge, vocabulary knowledge, and verbal short-term memory (Chung, Ho, Chan, Tsang, & Lee, 2010; Lin et al., 2018; McBride-Chang et al., 2003; Shu, McBride-Chang, Wu, & Liu, 2006; Tong, McBride, Shu, & Ho, 2018). Kalindi and Chung (2018) compared cognitive-linguistic and literacy skills (i.e. MA, PA, visual-orthographic knowledge, rapid naming, vocabulary knowledge, verbal short-term memory, Chinese word reading, and dictation or spelling) between 54 readers with dyslexia in Grades 5 and 6 to 54 chronological age-matched typical readers. The early adolescent readers with dyslexia performed less well than the typical readers on all cognitive-linguistic and literacy measures, except for PA. Both groups’ scores showed significant correlation between MA and Chinese word reading and dictation. Kalindi and Chung (2018) highlighted the potential importance of MA, visual-orthographic knowledge, and rapid naming in Chinese word reading and writing in the literacy development and impairment in Chinese early adolescents.

2.3 **Cognitive-Linguistic Skills in Chinese Literacy**

The differences in sound and meaning representations between the Chinese and alphabetic writing systems result in the differences in cognitive-linguistic skills that are important between the two language systems (Yeung et al., 2013). While the letters, the smallest units in alphabetic scripts, indicate only sound but any meaning, a Chinese character is simultaneously a visual whole, a syllabic unit, and morpheme (Zhang, 2015; 2017). Due to this script-sound-meaning combination of the Chinese characters, orthographic skills and MA are essential in Chinese literacy development, whereas, phonological skills are less emphasized in Chinese readers (Yeung et al., 2013).

MA has been reported to be a reliable predictor for word reading, spelling, fluent reading, and RC across various alphabetic languages (Deacon, Tong, & Mimeau, 2016; Nagy, Berninger, & Abbott, 2006; Tong et al., 2018; Zhou et al., 2017). However, in the Chinese language, MA has also been found to reliably predict character writing, reading fluency, and RC in Chinese learners (Deacon et al., 2016; McBride-Chang et al., 2006; Shu et al., 2006; Tong et al., 2011; 2018; Yeung et al., 2013; Zhang, 2015; 2017; Zhou & McBride,

2018). Therefore, an effective Chinese literacy intervention for children with dyslexia should emphasize on improving MA (Wang & Anderson, 2010).

2.4 Issues that Impede Chinese Literacy Development

Other than lack of appropriate interventions, children with dyslexia in Chinese literacy in Malaysia face several issues that might impede their Chinese literacy development. Such issues include reading instructions and teacher-student ratio. The main reading instruction used in most Chinese schools all over the world is intensive reading, so is Malaysia (Anderson et al., 2002). Conventional Chinese reading instruction allows children to master certain texts and specific characters. However, Anderson et al. (2002) stressed that the restricted focus of conventional Chinese reading instruction could not foster strategic reading or promote extensive vocabulary growth in children. By simply looking at the Chinese characters itself, the word structure does not provide much reliable and consistent information about pronunciation (Anderson et al., 2002; 2003).

The teacher-to-student ratio in a typical first-grade classroom in China and Malaysia are similar, where every class teacher has about 30-60 children in the teacher's care (Wang & Anderson, 2010; Anderson et al., 2002; 2003). Chinese children in both countries experience whole class teaching, and only 30-60 minutes of Chinese reading instruction a day. The lack of guided reading time could impede the learning of low-achieving readers, especially children with dyslexia.

Up to date, there are no explicit reading model on Chinese language (Yeung et al, 2013). However, by looking at reading development models in alphabetic languages, reading development of Chinese language could be understood (Yeung et al., 2013). In continuous development approach (Varnhagen, McCallum, & Burstow, 1997), literacy development requires different knowledge and strategies throughout the learning process. Knowledge and strategies required for Chinese literacy and alphabetical languages, such as English literacy, are similar and different in certain extent.

Beginner Chinese readers use the same analogy of English reading, which emphasizes word decoding skills, to read Chinese (Ho & Bryant, 1997; Ehri & Robbins, 1992). Reid (2009) affirmed that orthographic transparency predicts rate of literacy learning, particularly word reading/decoding across different language. English, an alphabetic language, allows more transparent mappings between phonology and orthography (Aro & Wimmer, 2003; Wimmer & Goswami, 1994). Hence, phonological awareness is critical for reading acquisition in English orthographies (Aro & Wimmer, 2003; Wimmer & Goswami, 1994). However, in the Chinese language, associations between sound and print are arbitrary and the orthography is not phonologically reliable (Wang & Anderson, 2010).

2.5 Objective of the Study

Wang and Anderson (2010) addressed the prominent need to overcome the concurrent issues in developing effective Chinese literacy intervention by designing an intervention that included two approaches: SBR (Holdaway, 1979) and MI (Wu et al., 2009). SBR approach was developed by Holdaway (1979, 1980), as a way for teachers reading texts to a group of students, replicating the enjoyable book-sharing experience that many parents create when they read books to their children. The ultimate goals of SBR approach is to induce reading behaviour that is self-selected, intrinsically rewarded, and highly individualized in children (Holdaway, 1982). Some of the activities emphasized in SBR approach includes opening warm-up by reciting favourite poems, jingles, songs or teaching of a new poem or song; instead of isolated phonic drills, the group go through a series of language games in meaningful situations, such as alphabet games, rhymes, songs using letter names; and more.

MI is an approach, designed by Wu et al. (2009), that emphasizes on word identification and cultivating the disposition to read Chinese characters with meaning. MI was designed to teach Chinese readers how to grapho-morphologically analyse Chinese characters and morphologically analyse Chinese words (Wu et al., 2009; Anderson & Wang, 2010). Then the readers could apply these knowledges when encountering new characters and words.

Wang and Anderson (2010) conducted a case study on the effectiveness of a Chinese reading intervention on preventing reading difficulties in an at-risk Chinese first grader. Based on the child's reading profile, Wang and Anderson (2010) designed a 1-to-1 intervention with four tasks: (a) easy reading, (b) SBR, (c) short lessons using MI on character decoding, character and word structure, or comprehension strategies, (d) writing activity. The intervention was carried out for one hour daily, five days weekly, for eight weeks. Significant improvements in Chinese reading were demonstrated in the child. Scores for word reading, characters dictation, and pinyin (syllables) dictation in the child were heightened after the implementation of the intervention. Moreover, the child was reported to have employed wider range of reading strategies, such as identifying semantic and phonetic components of new compound characters and figuring out their pronunciation and meaning.

The case study in Wang and Anderson (2010) subscribed to a series of detailed descriptions from observation and interviews. One of the advantages of descriptive case study is to gain a relatively more holistic insights of the learning styles of the targeted population thru the point of view/observation of their primary care takers and the experimenters (Baxter & Jack, 2008). However, these qualitative data and observation could be subjected to biased subjective judgment of the researchers and the care takers. Furthermore, qualitative data often do not provide detailed procedures.

Hence, replicating qualitative studies could be relatively challenging than that of experimental quantitative studies. To demonstrate a clearer boundary in the effectiveness of the intervention by Wang and Anderson (2010) on Chinese literacy development, this study replicated the intervention by Wang and Anderson (2010) in a single-subject experimental design. This study included two intervention tasks in Wang and Anderson (2010), which were SBR, and MI. By employing single-subject experimental design, this study could demonstrate how SBR and MI effect on literacy development in Chinese children with dyslexia. Combining the knowledge of cognitive-linguistic skills for morphological skills in Chinese literacy, and intervention designs in Wang and Anderson (2010), this study aims to explore the following research questions:

- 1) Would Share Book Reading improve Morphological Awareness and hence word reading in children with dyslexia?
- 2) Would Morphological Instructions improve Morphological Awareness and hence word reading in children with dyslexia?

METHODOLOGY

3.1 The Child Recruited for Intervention

The child recruited to receive one-on-one tutoring was Ling (pseudonym), a first-grade student enrolled at a Chinese primary school in Kuala Lumpur. At 6 years old, Ling was diagnosed with Specific Learning Disorder, with difficulties in RC, slow and effortful reading rate and fluency, and impairment in written expression (i.e. spelling accuracy), by a registered clinical psychologist. Ling was recruited as a student for tuition sessions, where the experimenter, I, was the tuition teacher. Consent from Ling's mother for Ling to take part in this study was sought. The study was conducted at the study room of Ling's home.

3.2 Research Design

In Wang and Anderson (2010), single-subject case study design was used. However, to obtain more valid and reliable evidence-based data, this study employed single-subject experimental design. This study employed A (Baseline 1) - B (intervention 1) - C (Intervention 2) - A (Baseline 2) within-subject design. Intervention 1 during phase B was MI, and Intervention 2 during phase C was SBR. Baseline (phase A1) was established by probing of MA without any intervention for at least 3 time-points (e.g. Monday-Wednesday-Friday). After baseline was established, MI (phase B) were carried out for four weeks. After four weeks, SBR integrated with MI (phase C) were carried out for another four weeks. Throughout the 8 weeks of intervention, probing for MA and RC were conducted twice for every week. Finally, the interventions were

withdrawn, and the child was probed for MA and Reading Accuracy (RA) for at least three time-points as another baseline (phase A2).

To ensure that the validity of these interventions, MA was also measured by a homophone awareness test at the pre- and post-intervention level. Other cognitive-linguistics skills in Chinese literacy, such as PA and RC, were measured at the pre- and post-intervention level.

3.3 Research Instruments and Materials

Ling was administered a battery of assessments and probes: a PA assessment (onset-rime awareness; Chan, 2013), a MA assessment (homophone awareness; Chan, 2013), one MA probe (McBride-Chang et al., 2003) and one RA probe (Leung et al., 2007). The pre- and post-assessments of this study are the same: PA MA, and RC assessment. The PA and MA scores were analysed through comparison of descriptive statistics, i.e. the score of PA was higher in post-intervention than in pre-intervention. Her RC performance was analysed through her performance in the examinations in school before and after the implementation of intervention.

In this study, materials used were sourced and accessible through the Internet. In this study, the materials used on the first day of each week were used throughout the week. Hence, eight set of reading materials were used throughout the study.

Easy reading. The texts used in Easy Reading were extracted from the Malaysian KSSR Primary 1 Chinese textbook (Kementerian Pendidikan Malaysia; see Table 1). The texts used in Easy Reading were familiar to Ling, as she had read them in school with her classmates and schoolteachers for the list of texts used in Easy Reading.

Morphological instructions. During Phase B, targeted characters were selected from the texts from Easy Reading. Then, during Phase C, targeted characters were selected from the storybooks read during SBR. 5-6 characters were explored during every session. Same list of words was discussed throughout the week (see Table 2). Selected words had similar sounds with either phonetic radicals or new characters. New formed characters included only those had transparent semantic radical, hence, the concept of semantic-phonetic compounds among Chinese characters could be effectively reinforced in Ling's learning through this intervention.

Shared book reading. Storybooks with fun content were used during this session. The storybooks used had included words that were explored during Easy Reading session. The story books selected in this study were all abode to the criteria suggested by Anderson et al. (2002). The difficulty of the books selected varied from easy to average across the four weeks of SBR phase according to the criteria listed by Anderson et al. (2003).

3.4 Procedures

This study employed a single-subject experimental design (A1-B-C-A2). There were four phases during the intervention: Pre-Intervention Baseline (A1), MI (B), SBR (C), and Post-Intervention Baseline (A2).

Phase A1. The probes for MA and RA were both implemented on Ling at three time points (i.e. Monday – Wednesday – Friday) for a stable baseline. The collection of data took about 5 minutes.

Phase B. The intervention in Phase B was MI. During the first session of every week, five words were selected from the text Ling had read with schoolteacher in her textbook few months ago (Ministry of Education, 2016). During the first and second sessions of each week, semantic and phonetic radicals of the words were identified by me. Then, the name and the meaning of the semantic and phonetic radicals were explained to Ling. Following, one to three more different semantic radicals were introduced and paired with the phonetic radicals. The pronunciation and meaning of the newly-formed Chinese characters, which would be similar to the original words or their phonetic radicals, were then taught to Ling. Lastly, the newly-formed Chinese character with another character were combined to form a new word. The meaning of the new compound word would then be explained and applied in a sentence.

During the third session of every week onwards, Ling would be prompted to remember and write down/tell: the characters that were discussed; the semantic and phonetic radicals of those characters; what new characters can be formed with those phonetic radicals and how to sound and explain those new characters; and what compound words can be formed with those newly-formed characters during the first two sessions.

Probing for MA and RA were carried out twice a week, for four weeks.

Phase C: This study replicated the SBR session designed in Wang and Anderson (2010): before, during, and after reading, with a little change in the after reading session, by integrated MI into the after reading activities.

Before the session. The sessions started with a ‘picture walk, in which I did a preview of the story with Ling. During this process, I first introduced the story, commenting on the picture on the cover of the story, then read the title with exaggerated enunciation, pointing to each character as she was prompted to read. Occasionally, I directed Ling’s attention to the pictures to get an idea of what the story was about, or asked questions to elicit words and phrases that were used in the text. After going through all the pages of the book, Ling was given briefly a minute to think about the story quietly.

During the session. The book was usually read to Ling during the first two sessions of the week. During the first session, predictions were checked against the text of the story. During the reading, I read slowly, clearly, and expressively, pointing to each character as it was read and using intonation to make quoted speech stand out. Ling was asked to follow along with her eyes. Occasionally, I broke the reading briefly to make a connection between the written text and an illustration. During the third and fourth sessions of the week, I prompted Ling to read the story in unison. When reading familiar words and phrases, I would stop reading and let Ling read the words and phrases out on her own. During the fifth session of the week, I read one page and Ling read the next page or we took turns to read the whole book.

After the session. After reading the story, questioning, discussion, and acting out the story were rotated throughout the week. Ten questions were formed for every story and were rotated throughout the week. At least three questions were asked for every session. At least one reflective question and two definitive questions were asked during every session.

After questioning and discussion of the story, Ling was asked to spot a word that she had learned during Phase B from some of the pages of the story. Ling was then asked to identify the semantic and phonetic radicals of the characters that she could recall and change the semantic radicals to form a new character, and form words from that new character.

Probing for MA and RA were to be carried out twice a week, for four weeks.

Phase A2. After Phase C was completed, the probes for MA and RA were both be implemented on Ling at four time points, to get a steadier baseline than that in A1.

FINDINGS

This research employed a descriptive single-subject design. The results were obtained by comparing the trends of pre and post-intervention data. No statistical test was used for interpretation of the data collected. The purpose of this study was to determine the effectiveness of the SBR and MI on the acquisition of Chinese literacy by looking at performance in MA and RA.

Pre and post-intervention. Generally, Ling’s PA and MA’s scores were elevated post-intervention (see Figure 1). For RC, Ling scored 40% in her school Chinese examination before intervention and 49% after intervention.

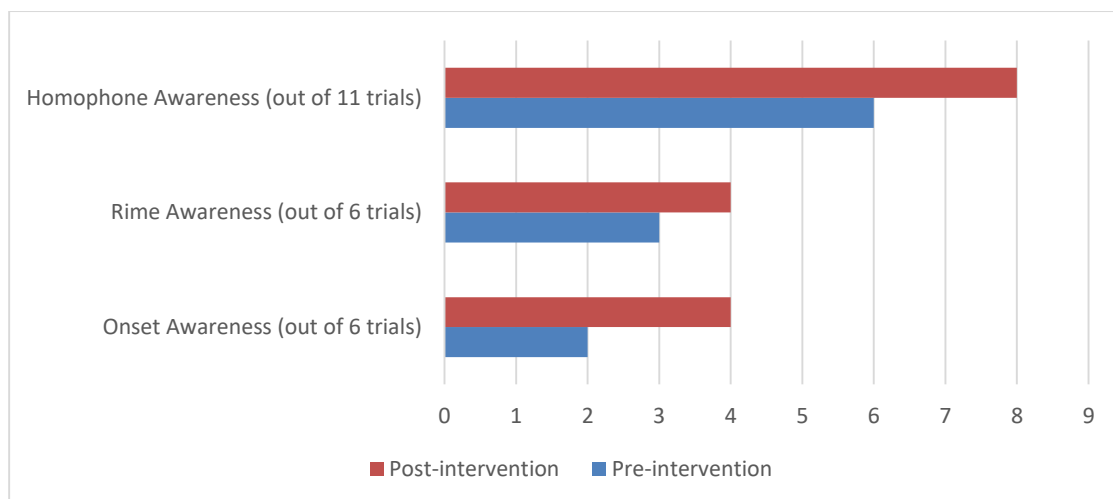


Figure 1. Trends of Pre and Post-Intervention PA Assessments.

Phase A1: pre-intervention baseline. The pre-intervention baseline in this study consisted of three time-points (20/7/2018, 22/7/2018, 25/7/2018). During A1, the number of correct responses for RA reported by Ling showed steady low trend, which varied between 1 and 2 correct responses; whereas, for MA, the correct responses were as low as 2 during the first two time points. However, the third time point for MA rose steadily onto the fourth time point, which indicated that the baseline established for MA was not steady sufficiently. Due to time constraint and urgency to start the data collection, time points during this phase were not extended for a steadier baseline.

Phase B: MI. Phase B lasted for eight time-points (30/7/2018 – 22/8/2018). When the MI were introduced, Ling’s scores for MA increased from 4 points to 6 points, which was the highest MA score during this phase (see Figure 2). For RA, the scores fluctuated between zero point to two points. By deducting the one familiar character in each set of probes, the MI seemed to have very little to no effect on improving Ling’s RA.

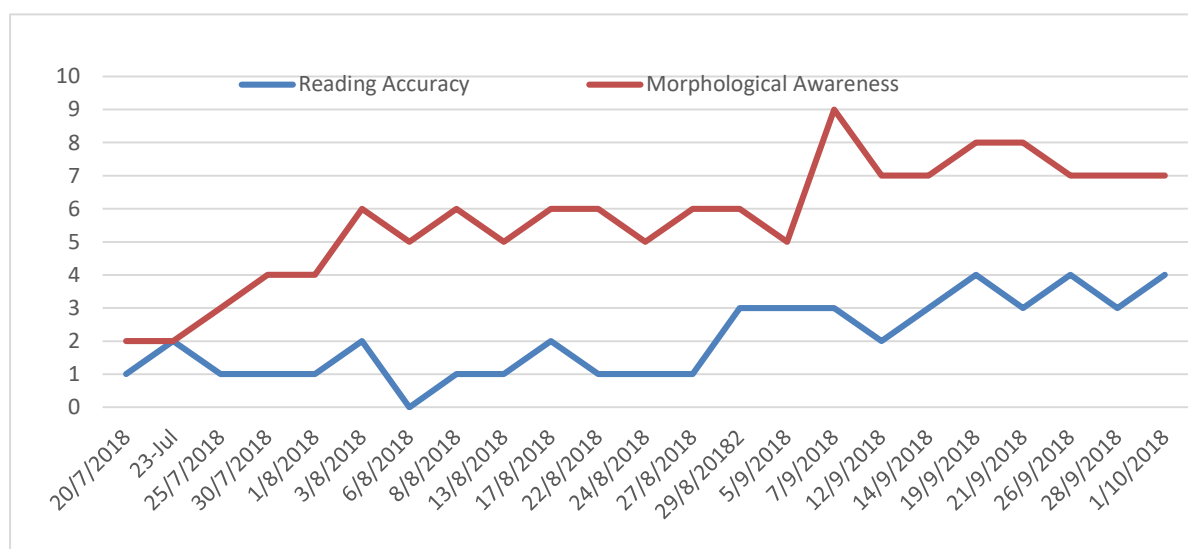


Figure 2. Trends of MA and RA throughout the Study.

Phase C: SBR. Similar to Phase B, Phase C also lasted for eight time-points (24/7/2018 – 19/9/2018), where the probe data were collected twice a week. The plateau for MA stretched up to the first four time-points after the SBR was introduced. Then, at the fifth time-point in SBR intervention, Ling’s score for MA

increased drastically by 4 points into 9 points, which was the highest MA score Ling had obtained over the course of data collection in this study. Then Ling's MA scored fluctuated between 7 points and 8 points until the end of SBR intervention.

For RA, Ling's score did not increase during the first week, which was the first two time-points of SBR intervention. Entering the second week of SBR intervention, Ling's score for RA started to increase gradually from one point to four points, which was the highest RA score obtained by Ling throughout the course of data collection in this study.

Phase A2: post-intervention baseline. Phase A2 lasted for four time-points. The results of both MA and RA were similar, where the improved scores maintained after both interventions were withdrawn. Ling continued to score between 7 points and 8 points for MA during the post-intervention baseline. Interestingly, Ling's highest score for RA, 4 points, was maintained after the SBR intervention was withdrawn.

During interventions. When Ling was first introduced to MI, she was enthusiastic to think of different semantic radicals to pair with the phonological radicals explored and try reading the newly formed characters. As Ling was needed pay attention to me during the first and second MI sessions of each week, she paid attention and was able to produce the same "new words" learned in the later sessions of the week, which showed that she remembered the originally-novel words that were taught to her. When entering SBR Phase, Ling was excited throughout the SBR phase, as she had the chance to listen and read the storybooks that she liked. She would prefer that I do all the reading first and then we read the books in unison. She was adventurous to take turns with me to complete the reading of the books as well.

DISCUSSION

The purpose of this study was to examine the effectiveness of MI and SBR on literacy development in Chinese first-grader with dyslexia in Malaysia. This study specifically explored: (1) if MI is effective in improving MA and therefore RA in children with dyslexia, and (2) if SBR is effective in improving MA and therefore RA in children with dyslexia.

The major result of this study was that SBR integrated with MI had robust effects on Ling's literacy development, particularly MA and thus RA. To answer the first research questions, MI only showed effectiveness in improving MA but not in RA. Ling demonstrated different patterns of data in MA and RA during the pre-intervention baseline sessions and beginning of phase B (introduction of MI). The increase in MA over the course of MI phase was similar to the studies by Wu et al. (2009). After the implementation of MI, Ling's MA scores showed improvement and grew doubled. Ling demonstrated higher performance in both MA and RA after the introduction of SBR integrated with MI. Similarly, in Wang and Anderson (2010), the child in the case study did demonstrate improvement in word reading after the reading intervention including SBR and MI. The highest MA and RA scored by Ling both occurred during the SBR phase. Hence, SBR integrated with MI was more effective in improving Chinese literacy development in children with dyslexia.

Moreover, the effect of SBR integrated with MI on Chinese literacy skills, particularly MA, in this study could be long-lasting on children who would undergo this intervention. Ling's elevated scores of both MA and RA in SBR phase maintained through the post-intervention baseline. This might indicate that Ling did grasp the decoding skills that she had learned during the SBR phase and was able to practise the skill independently after the intervention stopped. The effect of the interventions was supported by the post-intervention MA assessment as well. Hence, if Ling was exposed to the intervention continually, she might perform even better in the both MA and RA, and eventually, be able to generalize these reading skills to read Chinese characters by decoding them independently.

The effect of SBR integrated with MI on other Chinese literacy skills, PA and RC, was positive as well. After the interventions, both onset and rime awareness in Ling increased. The increase in onset and rime awareness suggest that the intervention was effective in improving PA in children's literacy development. As this increase was measured after the SBR integrated with MI intervention, it is unclear that if SBR or MI, or

they both effected on Ling's PA. Also, Ling's RC had improved after the intervention, as her school Chinese examination score was elevated.

Deacon and colleagues (2016) concluded numerous reading models in dyslexia that morphological awareness might be a strength in dyslexia, given the established phonological deficits in the dyslexics (Catts et al., 2006; Elbro & Arnbak, 1996). In Interactive-Compensatory model, Stanovich (1980) argued that a deficit in any process during reading would result in greater reliance on other sources of knowledge. In this study, the Chinese reading competency of the child with dyslexia, Ling, heightened, as her morphological awareness increased.

One other significant finding in this study was that the ineffectiveness of MI alone as literacy skill on literacy development, particularly RA. Despite the elevation in MA during phase B, the improvement reached a stagnant as soon as the third MI time-point. Such stagnant might indicate that MI alone was ineffective in improving MA in children with dyslexia. Furthermore, MI showed no effect on Ling's Chinese RA. No comparison for this lack of effect of MI on RA could be made to previous studies as RA was not assessed in Wu et al. (2009) and the effect of MI on word reading demonstrated in Wang and Anderson (2010) was implemented aside SBR. Possible explanations for the lack of effectiveness of MI on RA could be that learning MI as a reading strategy alone is insufficient to achieve good literacy development.

Results obtained in this study fit into reading development framework devised by Varnhagen et al. (1997). Instead of developing by stages, reading knowledge and strategies are developed simultaneously and accumulated with time. When reading strategies in a child increases, his/her reading knowledge increases as well, and vice versa. As Ling was exposed to two reading approaches (SBR and MI), her cognitive-linguistics skills improved. Whereas, when she was only exposed to one reading strategies (i.e. MI), her word decoding skills (i.e. RA) was not heightened.

Furthermore, McBride-Chang et al. (2003) supported that reading, vocabulary development, and MA could be bidirectionally associated with one another. For example, reading contributes to vocabulary development, which is associated with morphological skills. As Chinese readers gain more reading experiences, they can recognize more characters, and begin to connect semantic radicals to the meanings of different characters. Hence, with advanced reading skills, MA in experienced readers becomes more sophisticated. As Ling started to undergo the SBR intervention, her MA and RA scores increased.

CONCLUSION

This paper described the development and implementation of a Chinese literacy intervention for a child with dyslexia in Malaysia. The child with dyslexia made considerable improvements in cognitive-linguistics skills, i.e. MA, which further suggests that SBR integrated with MI may be effective in Chinese literacy development in children with dyslexia in Malaysia. Models fits to the data suggest that MA is the key factor in Chinese literacy and the relationship between MA and Chinese literacy are reciprocally causal to each other. This study adds to the evidence of the impact of MA on Chinese literacy. Despite the cultural differences in the Chinese language in Malaysia, and Hong Kong and China, the findings in this study parallel to the findings in other Asian countries, which emphasize the importance of MA for Chinese literacy development. By undergoing this intervention that combining Shared Book Reading approach and morphological instructions, children with dyslexia could decode a large group of Chinese words that requires high morphological awareness. This intensive one-to-one daily strategic intervention would allow children with dyslexia to have the practice, feedback, and support they need. Malaysian educators could refer to the result of this study to modify their teaching approaches to provide more effective educational help for the children with dyslexia who are learning the Chinese language.

A limitation in this study is the generalizability of data in this study. Despite that this study provides a clearer insight on the boundary between MI and SBR on Chinese literacy skills, particularly MA and RA, the findings were based on one child. Therefore, there is a need of replication with bigger group of children with dyslexia or with other Chinese readers with reading difficulties. Furthermore, there is no cognitive-linguistics skills measures developed based on the Malaysia context, particularly the population and national education curricula. Due to time constraint, the dependent measures used in this study were mainly developed

based on the populations from Hong Kong and Mainland China, i.e. Hong Kong Graded Character Naming Test (HKG CNT). Future research is encouraged to develop measures based on Malaysian data to ensure more valid findings in the field of Chinese literacy development in Malaysia.

Two implications were suggested in this study. The intensive one-to-one, eight weeks, five days a week intervention provided Ling, a child facing many reading difficulties, the practice, feedback, and support she need. As typical Chinese school in Malaysia has a low teacher-student ratio, with every class teacher has about 40-50 children in her care, whole class teaching, and only 30-60 minutes of Chinese reading instruction a day, children with reading difficulties, i.e. dyslexia, would not have sufficient direct guidance from the teacher. The lack of guided reading time could impede the learning of low-achieving readers, especially children with dyslexia (Wang & Anderson, 2010). Given that resources in public schools are often limited, and to address the lack of direct reading guidance in Malaysian classrooms, students should be exposed to approaches, such as SBR, where children are guided to become independent and strategic readers (Holdaway, 1980; Wang & Anderson, 2010). Furthermore, story reading paired with MI appeared to help Ling with the learning of the skills to analyse the grapho-morphological structures in Chinese characters, and the morphological characteristics of Chinese words. Teaching children these design principles of Chinese language systems allows them to apply these knowledges when encountering new characters and words, thus heightens their reading competence (Wang & Anderson, 2010).

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