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A Reading Support Program for Low-Income Preschool Non-Readers in Singapore

Abstract

In a highly literate society like Singapore, there still exists a small group of preschool non-readers coming mainly from low-income families. They are at utmost risk for literacy difficulties and failure. However, if these children are frequently read aloud to, they can acquire the necessary language and literacy skills to be able to read. Currently, voluntary welfare organizations, religious bodies, professional associations as well as the National Library Board offer reading support programs for such non-readers. In this study, we investigated the effectiveness of one such reading support program known as Support for Preschool non-Readers (SUPER) for preschool non-readers coming from low-income families. Our findings suggest there are significant improvements in the preschool non-readers' word knowledge acquired through picture-based vocabulary and word recognition acquired through print and word awareness after going through the 8-month reading support program. However, no significant gender and racial differences are noted.

Key Words: Low-income families, non-readers, preschool, reading support program

Introduction

According to the American Heritage Dictionary of the English Language-Fourth Edition (Houghton Mifflin, 2000), a non-reader is defined as someone who cannot or does not read, especially a child who takes a long time learning to read. There are also many other definitions for a non-reader. For example, the English Teachers Network (1997) has defined a non-reader as one who experiences phonological processing difficulties such as being unable to recognize and sound out letter-sound connections for single consonant or some consonant blends as well as unable to distinguish among short vowels. In another example, Martin and Pappas (2006) defines a non-reader as one who lacks the skills of a fluent reader, reads below the grade level and struggles with comprehension, phonics and vocabulary. As a result of feeling defeated, the non-reader turns off his/her desire to read and exhibits inappropriate behavior to hide his/her

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inability to read and comprehend. However, a non-reader can be seen as either a deprived reader or a disabled reader (Chia, 2013). Both terms mean two different categories of non-readers and are discussed briefly below.

A non-reading child is called "deprived because as he grows up he lacks what most people would consider essentials for living and for learning" (Rees, 1968, p.35). There are two ways of looking at deprived readers. On the one hand, they refer to those who are being disadvantaged by their situational circumstances and hence, in the long run, they can become disabled. For example, a child born in a dysfunctional family where parents are absent most of the time or never develop the habit of reading even newspaper will be deprived of a good role model. On the other hand, deprivation can be seen as a form of adaptation or compensation for such readers (Chia, 2013). For instance, a time-deprived reader will scan through the morning newspaper to get a gist of the current affairs.

The term-disabled reader – also known as backward reader (Alexander, 1992; Rutter & Yule, 1975) – refers to two different groups of such readers: readers with general reading backward and readers with specific reading retardation (Chia, 1998). The term *retardation* is no longer commonly used as it is considered impolite, prejudiced or politically incorrect. It has been replaced with the word *challenges*. The former group consists of those whose reading disabilities occur in the context of overall poor performance (Rutter & Yule, 1975) and they may have mental challenges (Alexander, 1992). The latter group refers to those with a disability specifically in reading, including those who are intellectually able but manifest poor or low performance in reading (Rutter & Yule, 1975). This second group includes those who are described as dyslexic (poor decoder), hyperlexic (poor comprehender) or non-specific reading disabled (poor decoder-comprehender) (Aaron, 1989, Chia, 1998).

Chia (2013) has argued that a deprived reader is disadvantaged by unmet needs (e.g., living in a remote place where print is totally lacking) and can end up becoming disabled (e.g., illiterate or inability to recognize letters/words at all because deprived of early exposure to print). In other words, it means that the deprived reader can be both disadvantaged and disabled simultaneously to a certain extent or he or she can regress from being disadvantaged to becoming eventually disabled.

In this paper, by the term *non-readers*, we refer to those who do not and/or unable to read because of their disadvantaged situational circumstances such as low socio-economic status, dysfunctional family, non-English speaking background and/or lacking exposure to appropriate educational experiences. In our study, we have narrowed our focus on a group of non-reading preschoolers aged between four and five years old. Unlike most countries, in Singapore, children at this age group are taught to recognize the English alphabet by letter names as well as say the letter sounds using phonics. The general learning goals for them in the kindergarten curriculum for language and literacy development are that they "will display appropriate reading behavior, develop some simple decoding and comprehension skills, and develop phonological awareness"

(Ministry of Education, 2003, p.9). As a result, the negative effects of these unfortunate circumstances on reading outcomes may place these preschool children at significant risk of future school failure.

In fact, several studies (e.g., Fry, 2008; Hemphill & Tivnan, 2008; Mancilla-Martinez, & Lesaux, 2011) have shown that, coming from low-income families, non-English speaking children learning to read and developing academic knowledge in a language they are not fully proficient faces compounding risk, making them vulnerable to poor academic results and increasing their likelihood of future school failure. In fact, Hoff (2006) showed that parents with young children from low-income families are less likely than those from middle-class families to engage in the kinds of focused conversational and book-reading routines that promote school-relevant language and literacy skills.

Foundations of Reading Development

Reading is a multifaceted process that involves word recognition, fluency, comprehension and motivation. When all these facets are properly integrated, meaning is created from print in the process that is termed *reading*. That is to say reading is making meaning from print and it requires one to identify the words in print (word recognition), construct an understanding from them (comprehension) and coordinate identifying words and making meaning so that reading is automatic and accurate (reading fluency) (Leipzig, 2001).

For young children to be able to read, they must be able "to identify written or printed words and understand the meaning of characters, words, and symbols" (Ong & Llanos, 2009, p.38) used in a given text of a certain genre (Chia, 1992; Wong, 2010). Those who do not have an adequate grasp of alphabetic recognition and textual meaning may, at the later stage, face difficulties in reading (Ong & Llanos, 2009). Reading development in young children involves (1) the procedural skills required to master the mechanics of reading, such as then ability to correspond letters to their respective sounds in combination in order to decode words; and (2) the conceptual skills and knowledge – including relevant prior experience and background knowledge related to the vocabulary, topic and structure of a given text – required to understand the text read (Lesaux, 2012).

Why Singapore needs a Literate Workforce

Singapore is a knowledge-based society that continues competing within the changing economic and political dynamics of the modern world in order to survive. English is an important language used throughout the world in diplomacy, economics and communication as well as in many fields including science, information technology, education, entertainment and business. Hence, if Singapore with a population of 5.4 million people were to succeed in the competitive world, our workforce has to be literate in English, which is also the main language of instruction in our education system, and at least one of our mother tongues (i.e., Chinese, Malay and Tamil languages), both academically and occupationally.

Previously, in the past two and a half decades, working adults, who failed to obtain a pass in English language at the national Primary School Leaving Examination (PSLE) level and/or a credit in the Singapore-Cambridge General Certificate of Education at Ordinary Level (GCE-O Level) examination, were given a second chance to study English language offered by the Institute of Technical Education in the Basic Education and Skill Training (BEST) program (launched in 1983) for those without PSLE certificate and the Worker Improvement through Secondary Education (WISE) program (launched in 1987) for those without a complete GCE-O level certificate (see Nathan, 2003, for more detail).

Today, the Workforce Development Agency (WDA) offers the publicly available Workplace Literacy (WPL) training. Under the WPL scheme, workers are required to take the post-WPL test to assess their level of proficiency in literacy. Upon the completion of Workplace Literacy and Numeracy (WPLN) assessment, each successful worker will receive a Statement of Attainment recognized by more than 3,800 employers under the WPLN Credentialization scheme. WPLN credentials are recognized by employers and some institutions as an alternative qualifications to GCE-N (GCE-Normal) and GCE-O level certificates for recruitment and training admission purposes (see WDA, n.d., for more detail).

In summary, for our workforce to remain competitive, our workers must continue to attain high literacy level. The Singapore Government has recognized the need for our children to be literate in two languages, i.e., English and a mother tongue, as young as possible before they embark on the compulsory formal education that begins at Primary 1 when a child turns seven. In fact, like language, "literacy learning, defined as reading and writing development, begins in infancy" (Neuman & Roskos, 1993, p.35).

Singapore's Literacy Rate

Singapore has been ranked amongst the top 100 countries with a high literacy level attained by her people. "Singapore has performed so well that the number of illiterate Singaporeans has become negligible. However, having a negligible number of illiterate does not mean we do not have illiterates among us" (Chia, 2013, p.90). Regardless of its number, illiterates still exist here. They need to be helped to become better informed of the daily events that are happening in our society as well as the world at large.

According to the UNESCO Institute of Statistics (2013), the average literacy rate of our population during the period from 1980 to 2010 was 90.11 percent with a minimum of 82.91 percent in 1980 and a maximum of 95.86 percent in 2010. The Central Intelligence Agency's The World Factbook (2013) places the literacy of total population (from age 15 years and over and who can read and write) in Singapore at 92.9 percent with male literacy at 98 percent and female literacy at 93.8 percent.

What is done to help and support Non-readers in Singapore

Currently, there is still a very small group of illiterate or non-reading young children, especially those who do not attend preschools or kindergartens, in Singapore. Although

there is no official statistics on the number, these young children come mainly from dysfunctional and/or low-income families. As such, these children are at utmost risk for literacy difficulties and failure (Elangovan, 2013; Lesaux, 2012; Perie, Grigg, & Donahue, 2005). Snow, Burns, and Griffin (1998) have reckoned that most reading challenges could be addressed by promoting language and literacy development. Studies (e.g., Bus, Van Ijzendoorn, & Pellegrini, 1995; Law, 2012; Snow, Burns, & Griffin, 1998) have shown that if these children were read to frequently, they could acquire the necessary language and literacy skills to be able to read. Moreover, for young children to move successfully from preschool to primary school, studies done by Dickinson and Tabors (2001) and Whitehurst and Lonigan (2001) have shown that this smooth transition depends on the expansion of their language and pre-literacy skills required for reading and essential for their future academic performance.

Reading is a dynamic construct and what is counted "as proficient varies as a function of text demands, situation, purpose of reading, and reader characteristics" (Lesaux, 2012, p.74). Hence, becoming an effective reader for a young child is a dynamic and complex process. For example, reading for a child at the age of three is different from reading at the age of five. As a child matures over time, his/her reading taste may change, too, and the child has to keep pace with the changing demands of text and the purpose for reading. According to Lesaux (2012), to become an effective reader, one must "not only decipher words on a page, but also use accumulating knowledge to assess, evaluate, and synthesize the presented information" (p.75). This means that to better support these non-reading preschool children (or preschool non-readers), procedural skills related to the mechanics of reading (e.g., letter-to-sound correspondence, blending of letter sounds to decode a word) and conceptual skills and knowledge (e.g., word knowledge, topic knowledge, textual structure) (Lesaux, 2012) described earlier are needed in the emergent reading development. A successful reading support program must incorporate these two essential sets of skills.

In Singapore, there are several reading support programs for young non-readers as well as reluctant young readers run by voluntary welfare organizations (e.g., family service centers and community self-help groups), religious bodies (e.g., churches, mosques and temples), professional associations (e.g., the Society for Reading and Literacy) as well as the National Library Board.

In the early part of the first decade of 2000s, for example, the Reading Specialists Association of Singapore used to run its *Reading* program within a primary school whose majority of the pupils came from low-income and dysfunctional neighborhood. Another example is the *Learning is Fun and Exciting* (LIFE) program offered by Beyond Social Services (2011), a charity organization established in 1969 and also known by different names such as the Bukit Ho Swee Social Service Center, the Bukit Ho Swee Community Service Project and Nazareth Center over time in its history. The aim of the *LIFE* program is to help young children with multiple challenges attain their age appropriate literacy level in English language so that they may have a better chance to further their education. Moreover, the program also aims to enable these children to

develop literacy skills in other areas, and rebuild their confidence and enthusiasm for learning and attending school regularly. The *LIFE* program also builds into its curriculum, opportunities to inculcate moral values.

A third example is the *Reading Rocks* program launched in 2012 and run by the Society for Reading and Literacy catering to disadvantaged pre-school non-readers living in Taman Jurong neighborhood (see Elangovan, 2013, for more detail). There was a high level of infrequent attendance as well as high dropout rate of participants from the program. Those who stayed on did display little or no significant improvement in their reading due to the lack of home support. Elangovan (2013) and Torgesen (1998) have argued strongly that children who got off to a poor start in reading rarely caught up; "poor readers almost invariably remain to be so, thus, the importance of intervening when they are young" (Elangovan, 2013, p.32).

The most widely known reading support program for non-readers in Singapore is the *kidsREAD* program launched in 2004 by the National Library Board (NLB) in collaboration with the People's Association and major ethnic community self-help groups in Singapore namely, the Association of Muslim Professionals, Chinese Development Assistance Council, Singapore Indian Development Association (SINDA), the Eurasian Association Singapore and Yayasan MENDAKI. The program has also received endorsement by various members of parliament and cabinet ministers. The aim of this national reading program is to promote the love of reading and language competence among children (ages four to eight) from low-income families, regardless of their ethnic backgrounds. "Majority of these children come from non-English speaking home environments, many of whom do not speak English at all. Most have also not been exposed to reading material of any kind" (Law, 2012, p.8).

Method

Aim of the Study

In this study, our sole aim is to find out the effectiveness of one such reading support program for non-reading preschool children coming from low-income and/or dysfunctional families. Known as *SUpport for PrEschool non-Readers* (*SUPER*) program, it is developed by a group of volunteers, who are early childhood trainee teachers, using the read-aloud approach because they believe young children can learn far more from read-aloud (Butler, 1998; Campbell, 2001). The program is part of their community service project serving the Jurong West neighborhood. The program has been running for a few years since 2009.

Research Design

This quasi-experimental research study used pretest-posttest design adapted from Campbell and Stanley (1966). We considered the research design most appropriate to determine the effectiveness of the *SUPER* program as a form of reading support treatment because randomization of subjects chosen to take part in the study was impractical and/or unethical (Gribbons & Herman, 1997). In other words, random

assignment to treatment and control groups would mean participants who are most in need of potentially helpful intervention would be deprived of it. A second reason is that this research aimed to study a cause-and effect relationship and where it is possible to introduce and control the treatment at a specific time or to a specific group of participants. A third reason is that quasi-experimental design is suitable for a community-level evaluation because financial factors usually prevent implementation of a full experimental model. Moreover, utilizing the quasi-experimental design also helped to minimize threats to external validity as the open or natural context does not suffer the same problems of artificiality as compared to a well-controlled laboratory setting (Shadish, Cook, & Campbell, 2002).

Pretest and posttest baseline data were obtained using two standardized tests – the Verbal Abstractions subtest of the Pictorial Test of Intelligence-Second Edition (French, 2001) and the Word Recognition and Phonics Skills Test-Second Edition (Moseley, 2003) – before and after the subjects underwent the 8-month *SUPER* program. The two sets of pre-test and post-test were analyzed and compared to determine the effectiveness of the *SUPER* program as a reading support for preschool non-readers coming from low-income families.

Participating Subjects

We used convenience sampling in this study because it allowed us to take in subjects, who were readily available and willing to participate in the study (Creswell, 2012). Moreover, convenience sampling also allowed us to proceed with our study in the shortest possible time.

At the beginning of the study, 41 non-reading preschoolers, aged between four and five years old, enrolled to participate in the *SUPER* program. They are of different races and come from low-income families with an average total household income of less than SIN$1500 per month. None of them has been diagnosed with any learning disability. All of them have an average 45 per cent of preschool attendance which means that for most of the time, these preschoolers have been absent from class. Among the 41 participants, 19 are Chinese, 13 Malays and 9 Indians. Eight of them left before the end of the eight-month reading support program and the remaining 33 participants consist of 17 Chinese, 9 Malays and 7 Indians. In the consent form signed by the parents of the participating preschoolers, we have stated that if the parent of any child wishes to withdraw from the program, they are free to do so without any question being asked. Hence, we did not know their reasons for leaving the program.

Instrumentation

We selected two standardized tests to target both the procedural skills and the conceptual skills and knowledge necessary for early reading development. They were administered to measure the pre- and post-program of the young participants and scored in terms of age equivalents. These are:

- Verbal Abstractions subtest taken from the *Pictorial Test of Intelligence-Second Edition* (PTI-2) (French, 2001).

This subtest was chosen to target the conceptual skills and knowledge necessary for early reading development. The subtest consisting of 38 items measures "auditory, visual and mental processing related to verbal knowledge, verbal comprehension, and verbal reasoning" (French, 2001, p.4), which constitute verbal topic knowledge. The subtest can also be used to assess the receptive vocabulary of young children. The picture vocabulary items of the subtest are based on formats used in previous picture vocabulary tests such as the *Picture Vocabulary Test for Preschool Children* (Van Alstyne, 1929) and the Full-Range Vocabulary Test (Ammons & Ammons, 1949). The subtest requires an examinee to identify and circle the pictures that represent the meaning of a spoken word or definition of a word or different in form or function from other pictures on a page. The scores are expressed in terms of verbal ability cum receptive vocabulary age (VA/RVA) equivalents (see Appendix 1 for test specifications).

- *Word Recognition and Phonics Skills Test-Second Edition* (WRaPS-2) (Moseley, 2003).

This test was chosen to target the procedural skills necessary for early reading development. The WRaPS-2 measures the phonemic awareness and phonics skills needed for word recognition. The test, with two forms A and B, can be grouped or individually administered and is designed to measure a young child's word recognition ability based on his/her word recognition standardized score expressed in terms of word recognition age (WRA) equivalent, 10 stages of word recognition, and the length of a word that is recognized about 80% of the time (Moseley, 2003) (see Appendix 1 for test specifications).

Protocol of the Reading Support Program

The *SUpport for PrEschool non-Readers* (SUPER) program follows the routines and procedures for meaningful learning through read-aloud set by Owocki (2007). Briefly, the *SUPER* format covers the following activities:

- Session 1: Modeling and scaffolding

Step 1: The *SUPER* program volunteers select and introduce one beginning thinking strategies (see Appendix 2) to the participating children for modeling and scaffolding.

Step 2: Next, the volunteers perform either of the two tasks:

a) Orally narrating from a picture book with colorful illustrations. Picture books "represent a unique visual and literacy artform that engages young readers … in many levels of learning and pleasure" (Wolfenbarger & Sipe, 2007) and the

illustrations complement the storyline that "follow a similar story, giving more detail to characters, settings or conflicts" (Booker, 2012, p.i).

b) Read aloud from a colorfully illustrated storybook or big book that will has been specially selected for the session basing on one of the two following criteria: firstly, it must have a highly predictable format such as *In a Dark Dark Wood* (Melser & Cowley, 1980) with the aim "to get the children settled down … to join together, to hear the rhythmic patterns of language and to participate as a group" (Neuman & Roskos, 1993, p.185); or secondly, it must be a narrative such as *Ira Sleeps Over* (Waber, 1972) "designed to enhance children's developing sense of story structure" (Neuman & Roskos, 1993, p.185).

Step 3: There are two alternative follow-up activities that volunteers can carry out.

Alternative 1: If volunteers have read aloud a storybook or big book, they can follow up with an activity involving print referencing. This approach is often used to develop and promote emergent reading awareness and interest in print by highlighting the forms, functions, and features of print during read-alouds (Zucker, Ward, & Justice, 2009). To implement print referencing, the volunteers call their children's attention to print with verbal and non-verbal referencing techniques using the following:

Questions: e.g., "How many words can you count on this page?" "There are words in the speech balloon, what do you think they say?"
Requests: e.g., "Point to the part where I should start reading on this page." "Point to a letter that can be found in your name."
Comments: e.g., "The writer used the word *giant* on this page." "*Fee fie foe fum*: these words are exactly the same on the earlier page …"
Non-verbal strategies: Track print from left to right while reading aloud. Point to each word read.

Alternative 2: After having narrated from a picture book, storybook or big book, the volunteer can use the text or illustration(s) to instruct in the selected thinking strategy (see *Step 1*). According to Owocki (2007), "Some strategies work well on a first read while some are easier to teach on a second read" (p.14). There are two tasks A and B for volunteers to carry out in implementing the thinking strategy:

a) Talk and Listen: Encourage children to respond to one another's thoughts about the story they have just heard rather than engaging in a conversation. It is to discuss something with another child what he/she thinks about the story is about and then shares with the rest.

b) Think Like a Reader: The volunteers will re-narrate the story based on the picture book or re-read the storybook or big book once more and pause at a certain point (or page) to prompt their children for responses in relating to a

particular portion of the story what they think and how they feel about an event, a character or an action.

- Session 2 and beyond:

The steps described above are repeated in the next session and beyond, each time with a different picture book, storybook or big book, until the end of the eight-month weekly program.

Read-aloud Techniques

In this study, the volunteers used two research-based read-aloud methods throughout the *SUPER* program: (1) the dialogic reading was used for the first four months of the program; and (2) text talk was used in the last four months of the program. The two read-aloud methods are briefly described below.

- Dialogic reading: This read-aloud method – developed and refined by Whitehurst and his colleagues (Arnold, Lonigan, Whitehurst, & Epstein, 1994; Lonigan & Whitehurst, 1998; Whitehurst et al., 1999) – is most commonly used with preschool children and provides a simple structure for making read-aloud more effective and productive. The method is based on three principles:

    a) Encouraging the child to become an active learner during read-aloud;
    b) Providing feedback that models more sophisticated language; and
    c) Challenging the child's knowledge and skills by raising the complexity of the conversation to a level slightly above his/her current ability (De Temple & Snow, 2003).

In the dialogic reading, the emphasis should be on asking "what" questions, following answers with questions, repeating what the child says, and providing help and praise (Whitehurst et al., 1988).

As the read-aloud interactions become more sophisticated over time, specific types of prompts (e.g., fill-in-the-blank prompts, recall prompts and open-ended prompts) are introduced to elicit oral answers from children in response to the questions asked about the story they have heard.

- Text talk: This read-aloud method focuses on vocabulary development. Children are engaged in a meaningful discussion about book used in the read-aloud. The volunteers can use text talk read-aloud to provide a context for introducing new words. This is how it is done:

    a) A text talk session begins with reading a story aloud;
    b) Three pictorial items from the illustrations or three words from the story are selected for discussion in more depth discussion with children. The

volunteers choose pictorial items with words (or vice versa) "that can be connected to what the children know, can be explained with words they know, and will be useful and interesting to them" (Lane & Wright, 2007, p.671).

c) According to Beck (2004), there are three tiers of word utility:

Tier 1 words are common, daily words that children probably already know.

Tier 2 words are less common words but ones that mature speakers of the language use and understand readily.

Tier 3 words are relatively infrequent words that are most typically associated with a specific content area.

In this program, only tier 1 words (with their pictorial representations found in the illustrations of picture book, storybook and/or big book) are selected for text talk.

Procedure

The two standardized tests – the Verbal Abstractions subtest of the PTI-2 and WRaPS-2 – were administered to all 41 children by the volunteers themselves. Only the results of 33 participants who completed the entire program were used in the data analysis.

The Verbal Abstractions subtest of the PTI-2 provided the VA/RVA while the WRaPS-2 provided WRA before and after the eight-month *SUPER* program.

The *SUPER* program was conducted three times a week on every Tuesday, Thursday and Saturday between 7.30am and 8.30pm over eight months throughout 2012 at rented classrooms in a neighborhood community center that is convenient to all participants staying around there.

Fidelity

In order to ensure fidelity of the *SUPER* program as reading support treatment, all the volunteers involved in the study were trained on all procedures prior to the beginning of the study. Moreover, the volunteers checked each step of the protocol (i.e., the procedural steps to be taken in order to conduct the *SUPER* program) as it was completed for integrity of procedures per session. A hundred per cent of procedural steps were done. Moreover, 50 per cent of all sessions were randomly selected for fidelity of treatment check. We completed the procedural check (see *Protocol of the Reading Support Program*) for strict adherence to the program guidelines in using the read-aloud techniques. Procedural fidelity across the volunteers was 98 per cent.

Data Analysis

The normality of the distribution of Verbal Abstraction Age (VA) and Word Recognition Age (WRA) scores in months was examined by considering estimates of univariate normality of skewness and kurtosis to test assumption of normality. Kline

(2005) recommended the cut-offs of 3.0 and 8.0 for the absolute values of normalized estimated of skewness and kurtosis respectively.

For the determination of the significance of differences between pretest and posttest results for significance of differences in scores, paired *t* test was used. Independent samples *t* test was used to determine gender and racial differences in terms of improvements of the differential between pretest and posttest in months.

Results

The VA and WRA scores were found to be normally distributed as all skewness and kutosis scores fell within acceptable values of ± 2.0.

The paired *t*-test reveals that the VA Pretest (M = 36.73, SD = 5.14) has significantly ($p < .01$) improved in the VA post-test scores (M = 60.36, SD = 5.14) by at least 23 months after the reading intervention (see Table 1). The WRA similarly showed highly significant ($p < .01$) progress (M = 59.18, SD = 4.88) of 15 months from the WRA_Pretest (M = 43.73, SD = 3.52).

Table 1
Paired t tests of pretest and posttest of VA and WRA scores (in months)

Variable	Mean	SD	*t*	95% confidence level	Cohen's *d*
VA_Post	60.36	5.70	32.64**	22.16, 25.11	4.35
VA_Pre	36.73	5.14			
WRA_Post	59.18	4.88	19.43**	13.83, 17.08	3.63
WRA_Pre	43.73	3.52			

Note. VA_Post: Verbal Abstractions Age Posttest; VA_Pre: Verbal Abstractions Age Pretest
WRA_Post: Word Recognition Age_Posttest; WRA_Pre: Word Recognition Age Pretest
n = 33
** $p < .01$, two-tailed; n = 33

Independent samples *t* test for gender and racial differences in VA and WRA improvement in scores for pretest and posttest revealed no significant differences on the impact of the efficacy of the intervention (see Table 2).

Table 2
Independent samples t test of differences in improvement of VA and WRA scores (in months)

Variable	Mean	SD	*t*	Significance (2-tailed)	95% confidence level	Cohen's *d*
VA_Imp_Male (n=21)	23.14	4.04	-.90	.38	-4.44, 1.72	-.32
VA_Imp_Female (n=12)	24.50	4.40				
WRA_Imp_Male (n=21)	14.71	4.34	-1.24	.22	-5.38, 1.31	-.44
WRA_Imp_Female (n=12)	16.75	4.86				
VA_Imp_Chinese (n=17)	22.76	4.87	-.84	.41	-5.43, 2.30	-.36
VA_Imp_Malay (n=9)	24.33	3.81				
WRA_Imp_Chinese (n=17)	16.59	4.76	1.37	.18	-1.32, 6.50	.57
WRA_Imp_Malay (n=9)	14.00	4.24				
VA_Imp_Chinese (n=17)	22.76	4.87	-1.08	.29	-6.11, 1.93	-.55
VA_Imp_Indian (n=7)	24.86	2.27				
WRA_Imp_Chinese (n=17)	16.59	4.76	.964	.346	-2.31, 6.36	-1.81
WRA_Imp_Indian (n=7)	14.57	4.39				
VA_Imp_Malay (n=9)	24.33	3.81	-.32	.75	-4.02, 2.98	-.17
VA_Imp_Indian (n=7)	24.86	2.27				
WRA_Imp_Malay (n=9)	14.00	4.24	-.26	.80	-5.23, 4.08	-.13
WRA_Imp_Indian (n=7)	14.57	4.39				

Note. VA: Verbal Abstractions Age; WRA: Word Recognition Age; Imp: Improvement

Inter-correlations of the pretest and posttest scores for VA and WRA shows that VA-Pre score is significantly correlated ($p < .01$) with VA_Post ($r = .71$), WRA_Pre ($r = .61$) and WRA_Post($r = .47$) (see Table 3). Based on Creswell (2012) interpretation of correlation values, VA_Pre has predictive effect on the other two variables (WRA_Pre and WRA_Post) though limited ($r = .35$ to $.65$). WRA_Post is also significantly correlated with VA_Post ($r = .44$) and WRA_Pre ($r = .45$). Thus performance in WRA_Post can be predicted with some limitation based on VA_Pre and VA_Post.

Table 3
Inter-correlations of VA and WRA for Pretest and Posttest

Variable	1	2	3	4
1. VA_Pre	-	.71**	.61**	.47**
2. VA_Post		-	.29	.44*
3. WRA_Pre			-	.45**
4. WRA_Post				-

Note: VA: Verbal Abstractions Age; WRA: Word Recognition Age
VA_Post: Verbal Abstractions Age Posttest; VA_Pre: Verbal Abstractions Age Pretest
WRA_Post: Word Recognition Age_Posttest; WRA_Pre: Word Recognition Age Pretest
n = 33
*$p < .05$; **$p < .01$

Discussion

The findings of our study can be discussed at two levels: program-level and factor-level. At the program-level, we look at the effectiveness of the *SUPER* program as a reading support treatment for preschool non-reader. The results of our study suggest that the read-aloud techniques (i.e., dialogic reading and text talk) used in the *SUPER* program helped to increase the subjects' word knowledge as well as word recognition. Our findings are supported by other studies that have shown that read-aloud to children can increase their vocabulary (Beck, McKeown, & Kucan, 2002; De Temple & Snow, 2003) and increase their ability to recognize words (Stahl, 2003). In addition, our study also shows that using non-verbal strategies (e.g., tracking print from left to right while reading aloud, and finger-pointing words during oral reading) has helped to promote print awareness and interest. Our findings are again supported by other studies (e.g., Adams, 1990; Hiebert, 1981; Justice & Ezell, 2000, 2001, 2004) that have shown word and print awareness serve as key predictors of later reading achievement as well as foundation for emergent reading development (Stuart, 1995).

At the factor-level, we look at the two main factors – (1) word knowledge is acquired through picture-based vocabulary and (2) word recognition is acquired through print and word awareness – that we believe are the two important keys that will help to equip preschool non-readers with print and word awareness through meaningful and interesting engagement through picture books, storybooks and/or big books. The findings of our study suggest that there is a significant improvement in the subjects' picture vocabulary in terms of VA from the VA_Pre of M = 36.73 (SD = 5.14) to the VA_Post of M = 60.36 (SD = 5.70), by at least 23 months, over a period of eight months attending the *SUPER* program. In fact, the subjects' word recognition improved significantly in terms of WRA from the WRA_Pre of M = 43.73 (SD = 3.52) to the WRA_Post of M = 59.18 (SD = 4.88), by 15 months, over a period of eight months undergoing the *SUPER* program. The results appear to indicate that higher VA did help improve WRA of preschool non-readers to identify and learn new words in a relatively

short period of eight months. The results agree with the earlier findings of Goodman's (1965) study that found children's learning of sight words was enhanced when pictures were paired with words to be learned. Denberg (1976-1977) commented that "pictures are introduced, not to supplant print but to provide one additional source of information from which the beginner (reader) can sample as he reads" (p.176). In fact, pictures associating with corresponding words or illustrations depicting sentences found in the text provide additional information that can be used in facilitating "effect on word identification in context and a smaller, though significant, facilitative effect on word learning" (Denberg, 1976-1977, p.176).

We have also noted that the improvement in subjects' performance in WRA_Post can be predicted using VA_Pre (r = .47, p < .01) and VA_Post (r = .44, p < .05) but with limitation according to Creswell (2012). How well the subjects performed in word recognition is dependent on the picture-based word knowledge (vocabulary based on pictures) they acquired during the reading support program. This limitation can be explained by Samuels' (1967) early work on the focal attention theory suggesting that, for non-readers of normal ability, when a new word to be learned is accompanied by other stimuli, such as a related picture, less efficient learning took place. The reason behind this effect is that part of the attention is directed away from the new word and towards the accompanying pictorial cue (Singer, Samuels, & Spiroff, 1973). Other studies (e.g., Fossett & Mirenda, 2006; Saunders & Solman, 1984; Singh & Solman, 1990) have confirmed Samuels' theory and found that when pictures accompanied the words, students took longer time to reach criterion and made more errors than when pictures were not used.

One other interesting finding that we have found in our study is that there are no significant differences between the boys (n = 21) and girls (n = 12) in their respective improvements in both VA and WRA (see Table 3). However, the girls' performance in both VA (M = 24.50, SD = 4.40) and WRA (M = 16.75, SD = 4.86) is slightly higher or better than the boys' performance in VA (M = 23.14, SD = 4.04) and WRA (M = 14.71, SD = 4.34).

Another interesting finding in our study is that there are also no significant racial differences in improvement of VA and WRA scores (see Table 3) among the three races, i.e., Chinese (n = 17), Malay (n = 9) and Indian (n = 7). Unlike the finding of our study, significant racial differences in children's literacy skills have been reported in other earlier studies (e.g., Bachman, Morrison, & Bryant, 2002; Cooney, 1999; Jencks & Philips, 1998). What is unclear is whether these racial differences reported in other studies are the result of variations in socio-economic status, parenting behaviors, socio-cultural beliefs, or a combination of these factors. However, in our study, regardless of the different races, all our subjects come from low-income families, whose parents are not highly educated.

Conclusion

Literacy development in preschool children is a dynamic, multi-dimensional process. It involves a complicated network of factors (e.g., socio-cultural elements such as ethnic groups and socio-economic status; developmental elements such as IQ, language and phonological skills, social skills, and temperament; parenting factors such as parenting style, family learning environment and home stimulation) that interact with each other at different levels of influence (McClelland, Kessenich, & Morrison, 2003).

When we turn to focus on preschool non-readers, there remain a lot of unexplored issues of concern (e.g., reading attitude, non-reader's motivation in learning to read, and perception of a non-reader about reading) that require further studies to be conducted. One example is to find out if children can become too dependent on the pictures to learn new words or identify more words correctly. Another example is to do a comparative study between preschool non-readers and disabled readers to determine how VA and WRA are affected differently between the two groups, and if a reading support program such as the *SUPER* program used with former can also benefit the latter.

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Appendix

Appendix 1
Statistical information about the tests used

- Verbal Abstractions subtest taken from the *Pictorial Test of Intelligence-Second Edition* (PTI-2) (French, 2001)

The internal consistency reliability of the items on the Verbal Abstractions subtest of the PTI-2 was investigated using Cronbach's (1951) coefficient alpha, a generalization of the Kuder-Richardson Formula #20 for dichotomously scored items. According to French (2001), the averaged alpha to indicate the overall reliability of the Verbal Abstractions subtest and quotient regardless of age is .89 (N = 972). Its coefficient alphas at six age intervals 3 years, 4 years, 5 years, 6 years, 7 years and 8 years are .91, .91, .91, .90, .85 and .83 respectively. The test-retest reliability for the subtest is .69 between first testing (M = 10.03; SD = 3.14) and second testing (M = 11.22; SD = 2.72) for a period of two weeks. The reliability for inter-scorer differences is .95.

- Word Recognition and Phonics Skills-Second Edition (WRaPS-2) (Moseley, 2003)

The validity of WRaPS-2 using Durham Performance Indicators in Primary Schools reading test as criterion has a satisfactory correlation of .80 (N = 571) (Moseley, 2003).

The WRaPS-2 was standardized in 2002–2003 on 4775 pupils in 111 schools, after extensive piloting to ensure good item discrimination and equivalence between Forms A and B (Moseley, 2003, p. 39). Its internal consistency reliability is high, with the overall Cronbach's (1951) alpha value of .97 in both Forms A and B. "Even in the Reception year, where children are most likely to resort to guessing, the alpha values are .86 and .84" (Moseley, 2003, p. 39). In addition, a word length score was calculated to represent the length of word correctly recognised at least 80% of the time. This too proves to be a reliable index, with an alpha value of .87. Its validity as a measure of progress in word recognition and phonics skills is confirmed because it is strongly correlated with performance on each test (r = .89 with Form A raw score and r = .93 with Form B).

Appendix 2
Beginning Thinking Strategies for Read-Alouds

As we pause, think about this:

- What has happened so far
- What you have learned so far
- What you think will happen next
- What you think you will learn next
- What you see in your mind
- Connections to your life
- What you think of the text
- What you wonder about while reading

Appendix 3
Tabulation of Results

No. (N=33)	**Gender**	**Race**	**CA**	**VA/RVA**		**WRA**	
				Pre (Yrs:Mths)	**Post** (Yrs:Mths)	**Pre** (Yrs:Mths)	**Post** (Yrs:Mths)
1	M	CH	4:03	3:03	5:03	<4:00	4:09
2	M	CH	4:09	3:06	5:06	4:03	5:00
3	M	CH	4:05	3:00	4:09	<4:00	5:03
4	M	CH	4:11	3:03	4:03	4:03	5:00
5	M	MA	4:01	<3:00	4:06	<4:00	4:03
6	F	CH	4:06	3:09	4:09	4:00	5:03
7	F	CH	4:07	3:09	5:06	4:03	5:06
8	M	CH	4:08	3:06	5:03	<4:00	5:00
9	M	MA	4:03	<3:00	5:00	<4:00	4:06
10	M	IN	4:03	<3:00	4:06	<4:00	4:09
11	M	CH	4:02	<3:00	4:09	<4:00	5:03
12	F	CH	4:06	3:03	5:06	<4:00	4:09
13	F	CH	4:08	3:06	5:09	<4:00	5:03
14	F	CH	4:03	<3:00	4:06	<4:00	5:06
15	M	CH	4:01	<3:00	4:09	<4:00	5:06
16	M	MA	4:09	3:03	5:06	<4:00	5:03

17	M	CH	4:10	3:09	5:09	4:06	5:09
18	M	IN	4:04	3:00	4:09	<4:00	4:06
19	M	MA	4:07	3:03	5:00	<4:00	4:06
20	M	IN	4:11	3:06	5:06	4:00	5:00
21	F	MA	4:05	3:00	5:03	<4:00	4:06
22	M	CH	4:06	3:03	5:06	<4:00	4:09
23	F	CH	4:00	<3:00	4:06	<4:00	4:03
24	M	CH	4:04	3:00	4:06	<4:00	5:00
25	F	MA	4:06	3:03	5:06	<4:00	5:03
26	F	CH	4:05	3:00	5:03	<4:00	5:00
27	F	IN	4:10	3:06	5:09	4:00	5:03
28	F	IN	4:08	3:03	5:06	<4:00	5:06
29	M	IN	4:02	<3:00	4:09	<4:00	4:06
30	M	MA	4:04	3:00	4:06	<4:00	4:06
31	M	MA	4:08	3:03	5:03	<4:00	4:09
32	M	MA	4:02	<3:00	4:03	<4:00	4:06
33	F	IN	4:01	<3:00	4:06	<4:00	4:06

Note: M=Male; F=Female; CA=Chronological Age; VA/RVA=Verbal Abstractions/Receptive Vocabulary Age; WRA=Word Recognition Age; M=Male; F=Female; CH=Chinese; MA=Malay; IN=Indian