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NIE Working Paper Series No. 4

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Suggested citation: O'Brien, B. A., Yin, B., Li, L., Zhang, D., Chin, C. F., Zhao, S., & Vaish, V. (2014). *Bilingualism, Literacy and Reading Achievement* (NIE Working Paper Series No. 4). Singapore: National Institute of Education.

ISBN: 978-981-09-3467-5

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Abstract

Bilingualism is becoming more common worldwide, and it remains a central educational policy in Singapore. In this document, we review research related to bilingualism and literacy development and achievement. Following an ecological framework, we outline known factors contributing to literacy achievement and discuss findings from bilingual research regarding these factors. We conclude with recommendations for educational practice informed by the research literature.

Section 1: Background and Introduction

It has often been said that bilingualism is the cornerstone of Singapore's education system. As a polyglot nation with citizens who speak Malay, Tamil, and Mandarin, the English language was chosen to be the language of instruction in Singapore. Thus, students in school who learn in English, while also maintaining proficiency in a mother tongue, are by definition all bilingual. But what does it mean to be bilingual? To know two languages is the simple answer, but this does not convey the nuanced definition of what it means to know a language. Nor does it capture the complexity in the different types and degrees of bilingualism that may exist on individual levels. Depending on one's perspective, language can be seen as a "hard-wired" skill specific to our species (Pinker, 1994) or the enabler of cultural transmission in human societies (Vygotsky, as cited in Lantolf & Appel, 1994), with different implications for what it means to know a language (e.g., as an innate endowment and/or as a socially acquired competence for communication). There is also diversity in terms of the level of fluency that any given bilingual person has with their two or more languages. Bilinguals may differ in whether they are equally proficient in their two languages (balanced/

effective bilinguals versus unbalanced/non-fluent bilinguals), how well they can comprehend versus produce the languages in question (receptive competency versus expressive competency), whether the subdivisions of linguistic skills (listening, speaking, reading and writing) are equally developed in both languages, or the ease with which they can communicate in their two languages in different use domains (e.g., functional, professional and academic settings).

The focus of this paper is on the interface between bilingualism and the acquisition and achievement of literacy. Literacy can be understood as the “control of secondary uses of language” (Gee, 1989, p. 23) in institutional contexts such as schools, businesses and workplaces. Along this line, literacy extends language beyond the primary use of communication among intimates such as family and friends, and is considered an interactive, collaborative activity for social purposes (Brisk & Harrington, 2006; Snow, 2004). On the other hand, literacy has also been understood as a psycholinguistic process, that is, an individual achievement of acquiring all the necessary skills and insights for written language learning. In this vein, literacy encompasses components such as “letter recognition, encoding, decoding, word recognition, sentence recognition, and so on” (Brisk & Harrington, 2006, p. 2). In either case, literacy differs from the primary use of language in that it requires conscious learning as opposed to being acquired effortlessly (Gee, 1989). Researchers adhering to the former viewpoint suggest that social supports are crucial to literacy’s optimal development, whereas proponents of the latter viewpoint argue that most children require instructional supports for learning to read (Snow, 2004). Both views may provide insights into ways to design optimal learning environments for children learning to read in more than one language (Snow, 2004). For example, for bilinguals, the distinction between primary and secondary uses of language may not just involve different institutional contexts, but also a different language altogether (e.g., using one language to communicate within the family, but another in schools and the outside world). Another useful question in the context of bilingualism is whether psycholinguistic processes learned through one language can be applied to the other by the bilingual.

The focus on literacy in this paper serves the purpose of understanding literacy acquisition in the unique environment of Singapore, whereby with its bilingual policy, literacy has the biggest impact on student achievement. To be specific, literacy activities such as reading would contribute more to learning academic than communicative language skills. Cummins (1979) made the distinction between *cognitive academic language proficiency* (CALP) and *basic interpersonal communicative skills* (BICS) to illustrate the difference between academic versus conversational fluency in a language, where the former is essential for students' success in school. Moreover, literacy is the main vehicle of instruction in schools, and is therefore deemed of primary importance to stakeholders, including parents, practitioners, teacher educators and policymakers. The intention here is to outline factors that are related to literacy and literacy development with regard to bilingualism, and to conclude with recommendations for pedagogy and assessment.

In conducting our review on bilingualism and literacy acquisition, we seek to address the following key questions that are of relevance to teachers, educators and policymakers globally and especially in a multilingual society like Singapore:

1. What are some of the environmental and cognitive/linguistic factors that are crucial to (bilingual) students' literacy development?
2. What are some skills that can be transferred between bilingual learners' two languages which can contribute to their literacy development?
3. What teaching strategies should be considered for application in bilingual classrooms that can assist students who have difficulties in language and literacy development?

Before proceeding with the rest of the paper, we first describe the methodology used for the review. We considered Bronfenbrenner's ecological systems model (1979) with regard to factors related to literacy acquisition. Once the factors were identified, we used the appropriate terms to search for peer-reviewed articles in databases such as PsycINFO and ERIC. Examples of search terms included *community environment*, *school environment*, *home literacy*

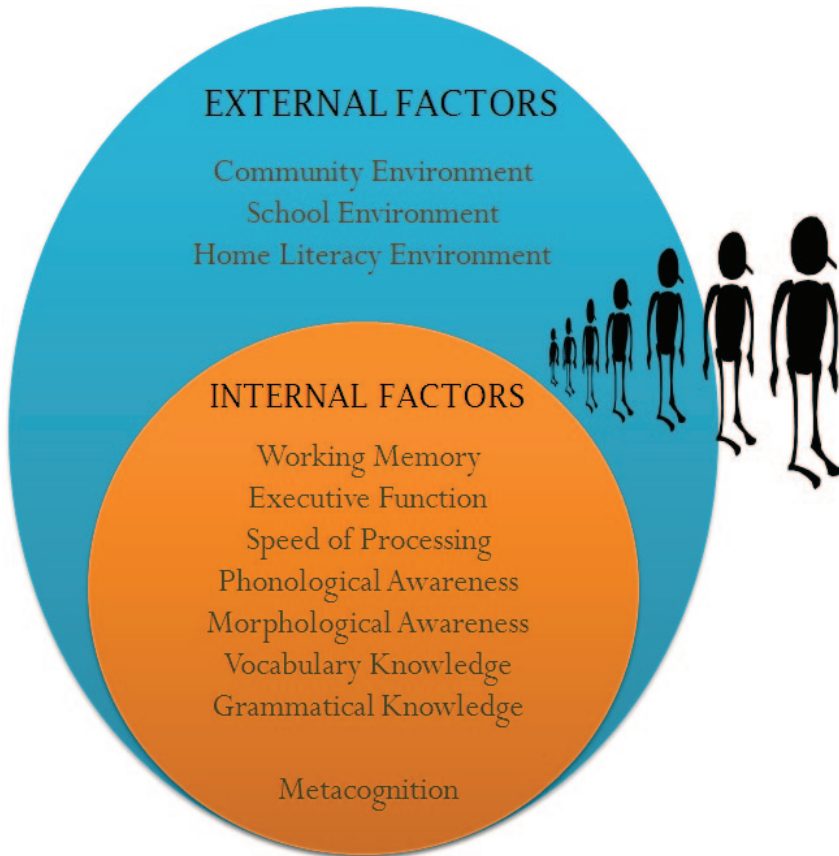
environment, working memory, executive function, speed of processing, phonological awareness, morphological awareness, vocabulary knowledge, grammatical knowledge and megacognition. Search was conducted by combining those terms with *literacy acquisition*. We then examined the abstracts, and selected studies that met our criteria for each thematic section focusing, respectively, on monolingual literacy development, literacy acquisition in bilinguals/second/heritage language speakers, and across-linguistic transfer in literacy acquisition. Chapters and review articles were also used to provide conceptual background for our review. We also conducted a separate search for the internal scan (for studies relevant to the Singapore context). To this end, we searched the National Institute of Education (NIE) Digital Repository for papers and theses using the same terms as provided and explained above. In addition, and for the sake of thoroughness, we also searched for articles in mainstream academic databases (such as PsycINFO and ERIC) using local researchers' as author name search terms.

Section 2: External Scan

Factors contributing to literacy

A body of literature about monolinguals has established a set of factors that contribute to the achievement of becoming literate. We first outline these factors as nested within an ecological systems framework (Bronfenbrenner, 1979), and then extend this model to bilingual research in the next section. Bronfenbrenner's model (1979) is an ecological theory of human development with its main tenet being that a child's behaviour can be explained by "the interplay between person and environment" (p. 16). This theory takes into account the effect of the multiple levels of environment on human development and at the same time acknowledges the active role that individuals play within such contexts. Like an onion, the ecological framework has many layers. Its external layer includes the community, school and home environment factors that affect learning to read, as well as reading to learn. The internal layer of the ecological system includes factors specific to individuals: their cognitive, linguistic and metacognitive knowledge (see Figure 1).

Figure 1. Ecological model of factors related to literacy.



Children's literacy development and achievement are affected by their access to reading materials and opportunities for literacy practice in the community and in school. Community-based factors include reading and writing activities practised after school and outside of domestic settings. They typically include literacy experiences such as library reading and other non-formal schooling and composition programmes initiated by community-based organizations. Library programmes in particular have been found

to play a crucial role in developing literacy skills during the early childhood and elementary school years (Celano & Neuman, 2013; Zapata, 1994), particularly for children from environments lacking in rich reading resources. However, the ideal way to enable these societal factors to come into play is through language-in-education planning (Cooper, 1989), which, according to Kaplan and Baldauf (2003), includes six dimensions, of which the resource access is an important part. Baldauf (2006) argues that language-in-education planning operates through micro-implementation of macro policy. In other words, although the language-promotion programmes are manifested in a top-down manner, change will not occur without the participation of grassroots-level agencies such as those of communities, schools and homes.

School-based factors include resources from library and classroom materials, following the recommendation that students have adequate exposure to a range of texts that are increasingly complex as they progress through the grades (National Governors Association Center for Best Practices, 2010; Snow, Barnes, Chandler, Goodman, & Hemphill, 1991). These physical resources are augmented by carefully constructed pedagogical environments that are critical to children's success in becoming proficient readers. Evidence-based best practices for teaching reading range from direct instruction in code-based skills (e.g., for phonics, see deGraaff, Bosman, Hasselman, & Verhoeven, 2009) to comprehension strategies (e.g., for predicting, questioning and summarizing, see Shanahan et al., 2010) depending on the level and development of the reader. It is worth noting that, apart from the physical resources described above, school-based factors should also encompass other "soft" dimensions such as school culture, leadership, and teachers' roles. Educational administrators and teachers as the main stakeholders are central agents in promoting any literacy activities.

Home constitutes the third component of the external layer. Some of the earliest influences on children's later achievement begin within the home literacy environment. Home literacy environment encompasses multifaceted factors which have strong and diverse influence on children's language and, directly and indirectly, their

literacy skills (Snow et al., 1991). Socioeconomic status of the family affects children's opportunities of accessing literacy resources and participating in literacy-related activities (Aram & Levin, 2001), but the availability of reading materials at home also predicts reading achievement of children independently from socioeconomic status (Chiu & McBride-Chang, 2006). Shared reading with parents, especially tutoring, is key to young learners' literacy development. Parents' oral reading to children also impacts their oral language skills, such as receptive vocabulary and phonological awareness (Sénéchal & Lefevre, 2002; Sénéchal & Young, 2008), that will provide an indirect impact on their literacy development.

In addition to receiving support from the three factors of the external layer above, children's literacy development and achievement are also directly affected by internal factors: the cognitive, linguistic/metalinguistic and metacognitive skills they acquire through interaction with these external layers of their environment. Cognitive factors include domain-general (e.g., working memory, executive functions and speed of processing) and domain-specific skills (e.g., phonological awareness and morphological awareness). Working memory refers to the ability to store and manipulate information for brief epochs. A principal component of working memory includes the "phonological loop", which is a mental process whereby information can be maintained in short-term memory by being re-articulated (Baddeley, 2003). This part of phonological working memory is important for learning the structure of language and is associated with reading development (Baddeley, Gathercole, & Papagno, 1998; de Jong & van der Leij, 1999). Executive functions, sometimes referred to as cognitive control, involve the mental control processes that focus, divide, update and switch attention, inhibit responses and connect working memory with long-term memory. These processes are related to reading-comprehension skills, and are compromised in individuals with learning disabilities (Swanson, 1999). Speed of processing contributes to reading development and is related to the measure of rapid automatic symbol naming. Rapid automatic symbol naming has been confirmed as an independent predictor of later reading fluency (Georgiou, Parrila, & Papadopoulos, 2008; Wolf, Bally, & Morris, 1986).

Learning to read is essentially metalinguistic (Nagy & Anderson, 1999). Typically, metalinguistic skills include phonological awareness and morphological awareness, which respectively involve the awareness of phonemes (i.e., the smallest units of speech, such as *ba*, *da*) and phonological structure, and morphemes (i.e., the smallest units of meaning, such as *un-*, *control*, *-able* in “uncontrollable”), and morphological structure of words. Phonological awareness has been firmly established as contributing to reading and spelling acquisition (Goswami & Bryant, 1990; Treiman, 1993) and playing a causal role in a failure to learn to decode words (Lyon, Shaywitz, & Shaywitz, 2003; Snowling, 2001). Morphological awareness stands as a unique predictor of literacy skills over and above phonological awareness. Students with better morphological awareness tend to read words more accurately and rapidly, and spell words better, and morphological awareness may also have an influence on reading comprehension, either directly or indirectly through other related variables (e.g., word reading fluency and/or vocabulary knowledge) (Carlisle, 2003; Kuo & Anderson, 2006; Nagy, Berninger, & Abbott, 2006).

The factor of linguistic skills of the individual contributes to their literacy attainment as well. According to the simple view of reading (Gough & Tunmer, 1986), listening comprehension is a primary contributor to reading comprehension, along with decoding. Although reading comprehension and listening comprehension are related throughout development, their association is reciprocal and increases with age (Perfetti, Landi, & Oakhill, 2007). Notably, linguistic skills that contribute to both listening and reading include vocabulary and grammatical knowledge. This is because comprehension of linguistic material, whether in the written or auditory form, entails the ability to take in word information and derive semantic, syntactic and referential relationships between successive words (Hoover & Gough, 1990; Hannon & Daneman, 2001). Vocabulary encompasses both the breadth and depth of the meaning of words, and has been consistently found to bear strong relations to reading comprehension (Lonigan, 2006), both directly and indirectly, through conceptual knowledge (Protopapas, Mouzaki, Sideridis, Kotsolakou, & Simos, 2013). Biemiller (2005) notes for

instance that while adequate vocabulary does not guarantee a high level of comprehension, its absence will surely lead to poor reading outcomes. Like vocabulary, grammatical knowledge may also be important in text comprehension by providing context that may aid word recognition, and by aiding in the process of building coherence and integrating words to generate propositional meanings.

Grammatical knowledge appears to contribute to comprehension in later primary grades (Klauda & Guthrie, 2008), but not to word reading skills that develop during the first years of education (Muter, Hulme, Snowling, & Stevenson, 2004).

Finally, metacognition includes the knowledge of self, aspects of the task, and strategies as well as the skill of self-regulation, such as monitoring and regulating activities to achieve goals (Flavell, 1979). Metacognitive strategies for literacy mainly include strategies that support comprehension and ways to carry out these strategies effectively (Bialystok, 2002). They can be specified as self-monitoring and regulating activities that focus on the product and the process of reading, support readers' awareness of comprehension, and assist in the selection of cognitive strategies as a function of text difficulty, situational constraints, and the reader's own cognitive abilities (Lories, Dardenne, & Yzerbyt, 1998; Van Den Broek & Kremer, 2000). Importantly, many metacognitive strategies proven to be supportive of reading comprehension, such as monitoring and regulating skills and effective application of relevant strategies, can be taught (Dole, Duffy, Roehler, & Pearson, 1991; Pressley, 2000). Another skill that could be listed under linguistic factors, but which nonetheless involve higher level skill for monitoring of one's comprehension of text, is inferencing. According to Kintsch & Rawson (2008), the reader develops a *situation model* when reading from the text base (i.e., the actual words and print), whereby semantic, syntactic and referential relationships are made between the words. That is, the reader makes sense out of the text by using background knowledge and referential and causal inferences about what is conveyed in the text. These inferencing skills differentiate good and poor readers (Barnes, Dennis, & Haefele-Kalvaitis, 1996), and it has been suggested that those poor in comprehension have a lower demand for text coherence and consistency (Hannon &

Daneman, 2001). Less skilled readers, who are either young or poor readers, fail to make anaphoric (Oakhill, 1993), text-integration (Cain & Oakhill, 1999) and causal inferences (Long, Oppy, & Seely, 1997). These inferencing skills predict reading comprehension beyond working memory, verbal intelligence, vocabulary and word reading accuracy (Perfetti, Landi, & Oakhill, 2007).

To summarize, this section looked at international research on literacy development among monolingual-speaking children, within a framework that gives consideration to factors both internal and external to the learner. It was found that community, school and home are important environmental factors that provide the necessary support for a child's literacy acquisition. Equally important, the development of skills internal to the child learner – whether cognitive, (meta)linguistic, or metacognitive – has profound consequences to the learning process.

Each of these sets of external and internal factors has been examined, to greater or lesser extent, within the context of bilingual readers. The literature reported next focuses on literacy in a second language (i.e., an L2-majority language such as English), while it also considers maintenance of the first language, that we refer to as L1, heritage language, or mother tongue language (MTL), depending on the context of the research. Each of the factors is treated in turn in the following sections.

Bilingual factors contributing to literacy

Community, home and school

What role does community play in improving second language learners' reading/writing proficiency in a multilingual context? Factors outside the formal schooling experience and domestic ambiance can impact on learners' acquisition of reading/writing abilities, and are especially important in the maintenance of MTL. In a multilingual society, inadequate holding of non-dominant language books in schools implies the importance of out-of-school availability of reading material. This is abundantly supported in the literature (e.g., Pucci, 1994), as the students of minority language depend greatly on the community library to provide them with free reading materials.

Other initiatives besides libraries that impact MTL maintenance/revitalization include language immersion programmes. As examples, the *kohunga reo*, or "language nests", set up in the early 1980s by elders in Maori community in New Zealand, at least indirectly fostered learners' interest in reading and writing in heritage language, while the transmission of Judaism in Palestine directly requires the literacy (orthography) maintenance and reacquisition of Hebrew. As Cooper (1989, p. 161) notes, "the linguistic heterogeneity of the Jewish population helped create a vernacular role for it outside the school".

School-based factors, on the other hand, have had to contend with reading achievement in the language of instruction that is often the second or third language for many students. Second-language learners' reading and writing proficiency has become a more prominent challenge in primary classrooms in developed countries like Singapore, the UK and US. In these increasingly diverse classrooms, children come from homes in which English is not the dominant home language (for instance in certain neighborhoods in the UK, Urdu or Punjabi could be the dominant home language). Yet these children must deal with an English-medium school system in which they are learning both content and language in and through English.

What then is the most appropriate pedagogy for such children especially with regards to reading? "Translanguaging" or code switching in the classroom has been used as a pedagogic practice to help English Language learners (Creese & Blackledge, 2010; Hopewell, 2011; Hornberger, 2003; Hornberger & Link, 2012). More specifically, "translanguaging is the purposeful pedagogical alternation of languages in spoken and written, receptive and productive modes" (Hornberger & Link, 2012, p. 262). Translanguaging is a method that may be used within different pedagogical approaches that vary in the degree and manner in which multiple languages are used in the classroom. For example, convergent teaching designates one language for teaching academic proficiency; two-way immersion teaching designates space in the curriculum for each language to be used; while multiple teaching involves always using both languages in combination (Garcia, 2009, p. 310).

The latter approach has been found to support more authentic teacher–student interactions in the classroom than a language-separation approach in a Spanish/English dual language classroom in the US (Gort & Pontier, 2013). The practice of using the student’s mother tongue or L1 to teach English has also been researched in numerous Asian countries where English is either the medium of instruction or taught as a second language, like in Hong Kong (Lo & Macaro, 2012; Lin, 1999), Taiwan (Tien, 2009), India (Vaish, 2008) and Brunei (Martin, 2003). For example, Tien (2009) found that the main reasons the teacher switched codes was to explain linguistic forms, manage the classroom, and build solidarity. An important observation made by Tien (2009, p. 188) is that “a strict formulation of function is not necessarily possible as a particular instance of code-switching may be multi-functional”. That is, in explaining linguistic forms, the teacher would switch from English to Mandarin so students would understand the content, whereas in teaching cultural issues, Mandarin was usually always used. In a similar study, Lo and Macaro (2009) explored the ways that the teacher code-switched in secondary schools in Hong Kong where the medium of instruction shifted from Mandarin to English, or where the medium of instruction was always English. Their key finding is that in the former type of schools, when the teachers used L2–English the class became more teacher-fronted and there was no code mixing for teachers or students: both used either only Chinese or only English.

With regard to written language, Martin (2003) focused on vocabulary in a study situated in Brunei, where Malay is the medium of instruction in the first 3 years of schooling and thereafter the medium of instruction changes to English. Through an in-depth analysis of one Science lesson in which the textbook is in English but the teacher uses Malay, Iban and English, Martin demonstrated how key lexical items like *carbohydrates* and *energy*, were explained to the students in Malay and Iban. Cummins (2012) describes a multiliteracy programme called *identity texts* used in a Canadian school where students collaboratively create stories and translate them into their home languages. This approach yielded a community of learning with cognitively engaging and culturally enriching experiences for students. This language separation approach is different from Hopewell’s (2011)

study in which Grade 4 students were tested on the recall of passages in English only and also in English and Spanish. Findings in both speech and writing showed that the bilingual approach enhanced comprehension but with one caveat. Analysis of written recalls revealed that students recalled more when they were allowed to use both Spanish and English to write than when they were only allowed to use English. However, these findings were mediated by topic, meaning that if the students were used to discussing a particular topic, e.g. Inventions, only in English, then their recall of this topic was better in English.

Similarly in studies by Lin (1999) and Vaish (2008) both the dominant home language and English (as a medium of instruction) were an integral part of the classroom ecology. In these studies the teachers used a similar strategy: they approached the text, which was in English, with the sole purpose of answering exam-type questions. The teacher used code mixing to guide students towards those passages in the text which answer the questions being targeted. In fact, in Vaish (2008) the teacher actually made the students bracket the exact chunk of text that would answer a question, and thereafter the students copied that specific chunk of text into their notebooks. This set of studies demonstrates the variations and purposes of code mixing in class, and how different bilingual instructional formats may affect student outcomes as well as the assessment of their achievement.

What role does home literacy environment play in improving children's reading/writing proficiency in a multilingual context? Studies assessing the relations between home literacy environment factors and bilingual children's learning to read have focused on learning in a socially superior language (Dixon, 2011; Kalia & Reese, 2009), in mother tongue (ethnic language or non-dominant language of the society) (Zhang & Koda, 2011) and in both languages (Duursma, et al., 2007; Lü & Koda, 2011). Home literacy environment has been found to be positively correlated with language and literacy development in L2 English learners, echoing the monolingual findings. Kalia & Reese (2009) reported that English exposure at home predicted preschool English Language learners' receptive

vocabulary and phonological awareness for middle socioeconomic status Indian families, while parental book reading and teaching of print both predicted children's print knowledge in English. By fifth grade, however, children's English proficiency did not rely on English language exposure and literacy support at home, as reported by Duursma et al. (2007) who studied fifth-grade American Spanish-speaking bilinguals' vocabulary knowledge in English and in Spanish. But their results did suggest that proficiency in Spanish requires both home literacy support and school instruction. Several other studies with immigrant children in the US suggest that home literacy environment impacts the development of heritage language and literacy skills. Zhang & Koda (2011) surveyed primary school Chinese heritage language learners' home literacy environment and found children's reading activities positively correlated to their morphological awareness and vocabulary knowledge in Chinese. Lü & Koda (2011) study profiled the home literacy environment and literacy skills of 37 Chinese heritage language learners from Grade 1 and Grade 2. They found parents' literacy support in Chinese affected children's Chinese literacy skills, especially oral vocabulary knowledge, but did not confound children's English literacy skills. The above studies among bilingual children demonstrate the importance of home support in bilingual children's literacy development in both dominant and non-dominant languages.

Cognitive, (meta)linguistic, and metacognitive underpinnings

In terms of internal factors, children's general and domain-specific cognitive skills also contribute to second language learning and literacy. Verbal working memory may contribute more heavily to reading acquisition and skill when the second language is very different from the first, with regard to how the written language represents oral language. For instance, verbal working-memory span contributes to English–L2 text comprehension by Hebrew-speaking secondary students (Abu-Rabia, Share, & Mansour, 2003), Chinese and other English-as-second-language (ESL) kindergarteners (Low & Siegel, 2005) and Korean–English bilingual children (Pae & Sevcik, 2011). Verbal working memory has been specifically linked to learning new vocabulary words in first and second languages, and is hypothesized to mediate phonological representations of

words (Masoura & Gathercole, 2005), which would contribute to word reading. One study by de Abreu, Gathercole and Martin (2011) demonstrated in a multilingual environment (in Luxembourg) that whereas the short-term storage component of working memory was linked to vocabulary development, the cognitive control component of executive functions was uniquely related to syntax and early reading development. Further, rapid automatic symbol naming shows a robust relation to reading across languages (Georgiou et al., 2008; Landerl et al., 2012; Tan, Spinks, Eden, Perfetti, Siok, 2005), and particularly for orthographies that are more transparent (as for German and Spanish, see Wimmer, Mayringer, & Landerl, 2000; Escribano, 2007) and also non-alphabetic (for Chinese and Japanese, see Ho, Chan, Lee, Tsang & Luan, 2004; Kobayash, Haynes, Macaruso, Hook, & Kato, 2005), suggesting naming speed is a stronger indicator of individual differences in reading ability for orthographies that demand less phonological analysis. Rapid automatic symbol naming is also a reliable predictor of ESL students who are struggling readers (Geva, Yaghoub-Zadeh & Schuster, 2000), and may be a marker of poor reading across orthographies (McBride-Chang et al., 2013).

The domain-specific skills of phonological and morphological awareness contribute to L2 reading performance, including comprehension (Kieffer & Lesaux, 2008; Melby-Lervag & Lervag, 2011; McBride-Chang et al., 2005). Naturally, the development of phonological awareness depends on children's language exposure as well as direct instructional methods. For instance, a comparison of Mandarin- and Cantonese-speaking children which showed stronger phonological sensitivity in English in the former group was suggestive that use of Hanyu Pinyin may have contributed to this advantage (Leong, Chen, & Tan, 2005). In regards to more direct intervention studies, Shanahan and Beck (2006) found some evidence in a meta-analysis that direct, explicit instruction of phonological awareness had similar effects on English Language learners as monolingual children, but with a smaller impact. More recently, Kuo and Anderson (2012) have shown that bilingual children from kindergarten to Grade 2 in Taiwan were better at learning a "new" artificial language's phonological patterns than monolingual peers. This advantage appeared for both the children who used a second language actively,

or who were simply exposed to it at home. Intervention studies with morphological awareness have also revealed that morphology-focused instruction could lead to enhanced development of literacy skills. A few recent integrative syntheses or meta-analyses (e.g., Bowers, Kirby, & Deacon, 2010; Carlisle, 2010; Goodwin & Ahn, 2010) have highlighted that students who received instruction on morphology, for example, derivational affixation in English and compounding in Chinese, performed well. In fact, they did significantly better than their peers who had not received instruction not only on morphological awareness measures, but also meaning inference skills and vocabulary knowledge, word reading (fluency) and spelling, as well as reading comprehension, although the effect sizes of the interventions varied depending on which level of literacy was the target measure. Such an intervention effect was not just restricted to monolingual English-speaking students. ESL learners or bilingual children also benefit from morphology-focused instruction (e.g., Carlo et al., 2004; Zhang et al., 2010).

Comprehension of texts has been found to be strongly correlated with learners' oral language proficiency. The simple view of reading comprehension as a product of decoding and listening-comprehension skills is found to provide a good account for English Language learner readers as well as monolingual readers (e.g., Zadeh, Farnia, & Geva, 2012; Proctor, Carlo, August, & Snow, 2005; Gottardo & Mueller, 2009). Listening comprehension in addition to decoding was found to contribute directly to reading comprehension and fluency. Also, vocabulary makes a notable contribution to text comprehension (Carlisle, Beeman, Davis, & Spharim, 1999; Dufva & Voeten, 1999; Haynes & Carr, 1990; Jiménez, García, & Pearson, 1996; Laufer, 1992; Lindsay, Manis, & Bailey 2003; Stæhr, 2008; Zhang, 2012). For example, in Stæhr's (2008) study, the vocabulary score explained 72% of the variance in text comprehension in L1 Danish/ L2 English learners. Zhang's (2012) study on L1 Chinese/L2 English learners also revealed vocabulary to be a substantial contributor to reading comprehension. In addition to the number of words children know (i.e., vocabulary breadth, which is what is measured by the typical vocabulary assessments), several studies have investigated vocabulary depth, or lexical knowledge about not only a word's literal

meaning, but also its syntactic roles, morphological variations and semantic associations with other words, such as synonyms and antonyms (Nagy & Scott, 2000). L2 learners are reported to show less semantic association between words (Vermeer, 2001). Schwartz and Katzir (2012) reported that among L2–Hebrew Russian immigrants, school experience helped to close their gap in vocabulary breadth more so than vocabulary depth. Proctor, Silverman, Harrington and Montecillo (2012), on the other hand, found that vocabulary depth contributed to initial scores but not growth in English Language comprehension beyond language status (monolingual English Language versus bilingual English Language–Spanish). Vocabulary instruction focusing on improving the depth and fluency of word knowledge has been shown to lead to improvement in reading comprehension among monolingual and ESL learners (Beck, Perfetti, & McKeown, 1982; Carlo et al., 2004). Grammar knowledge sensitivity is likewise usually positively correlated with reading comprehension, although to a lesser extent than vocabulary knowledge (Alderson, 1993; Geva 2006; Peregoy, 1989; Peregoy & Boyle, 1991; Zhang, 2012). It has also been found that the contribution of grammar knowledge to reading comprehension depends on the type of knowledge being measured (e.g., explicit versus implicit, see Zhang, 2012). Further, L2 syntax knowledge has been shown to be a strong predictor of reading comprehension in some studies (Schoonen, Hulstijn, & Bossers, 1998; Shiotsu & Weir, 2007; Van Gelderen, Schoonen, de Glopper, 2004). In terms of intervention, segmenting texts into syntactic chunks has been found to improve reading comprehension by monolingual children in primary school (O'Shea & Sindelar, 1983). Given that second-language learners are usually grammatically less proficient and struggle to master a full repertoire of grammatical rules, grammatical training may benefit their reading comprehension.

Finally, metacognitive strategies have been found to be associated with bilinguals' achievements in literacy. Carrell (1989) linked good L2 readers of English to such metacognitive strategies as clarifying the purpose of reading, identifying the important aspects of a message, focusing attention on the major content, monitoring comprehension, engaging in self-questioning to determine whether

goals are being achieved, and taking corrective action to facilitate comprehension. Schoonen et al. (1998) found that eighth and tenth graders' metacognitive knowledge played a significant role in reading comprehension of English as a foreign language over and above vocabulary knowledge. Kolić-Vehovec & Bajšanski (2007) explored comprehension monitoring, use of reading strategies and reading comprehension of Croatian bilinguals learning Italian as a second language. They found that comprehension monitoring was the most important predictor of reading comprehension in all students. This association was not limited to experienced bilinguals; it was also found among bilingual beginners. Ruan's (2004) study on Chinese–English bilingual first graders revealed that children's abilities to reflect, monitor and regulate their cognitive process affected their performance on a writing/composition task. The value of explicit cognitive and metacognitive strategy instruction has been underscored in the literature of literacy acquisition, particularly in research on bilingual or second-language reading (Baumann, Seifert-Kessell, & Jones, 1992; Pearson & Fielding, 1991). For example, Carrell, Pharis, and Liberto (1989) found that bilingual learners provided with instruction on a specific metacognition strategy (e.g., semantic mapping, in this study) significantly outperformed their counterparts who did not receive such training. Great effectiveness was also found with explicit instruction on a well-selected combination of strategies when bilinguals were engaged in reading and discussing a text (Cohen, 1998; Pressley, 2002, 2006).

With regard to inferencing skills in L2 readers, current research has focused on (incidental) vocabulary acquisition rather than reading comprehension. This is in contrast to the monolingual reading literature reviewed above, where inferencing refers to the ability to integrate information across clauses in a text and/or the ability to integrate textual information with general world knowledge (Cain, Oakhill & Bryant, 2004). Here, studies of how L2 learners may be able to use linguistic and contextual information to infer the meaning of unfamiliar words while reading for comprehension suggests that L2 learners are weaker than their L1 counterparts in using effective strategies to deal with unfamiliar words (Nassaji, 2003). And yet it is lexical inferencing that adult learners use most frequently when

encountering unfamiliar words in reading versus other strategies, like consulting a dictionary or ignoring the word (Fraser, 1999; Paribakht & Wesche, 1999). Reading texts for comprehension can increase both the depth and breadth of L2 learners' vocabulary (Paribakht & Wesche, 1999) which in turn leads to better comprehension skills. Needless to say, lexical-inferencing strategies help enable a synergetic relationship between vocabulary knowledge and reading comprehension (Paribakht & Wesche, 1999).

To summarize, this section examined international research on bilingual literacy development, focusing on bilingual and/or ESL speakers. Just like what has been found for their monolingual counterparts, bilinguals/ESL speakers' literacy development is likewise shaped by factors both internal and external to the learner in accordance with Bronfenbrenner's ecological model for human development. Support from the family, community and school is necessary to provide the optimal environment in which literacy acquisition takes place. In addition, development of abilities internal to the learner is equally critical for the learning process. The unique status of bilinguals/ESL learners having (at least) two languages in their linguistic repertoire does mean that differences exist between them and their monolingual counterparts with regard to different learning paths. For example, while L2 learners attain grade-level word reading and phonological processing skills, performance on reading comprehension and vocabulary tend to lag behind monolingual peers (Chen, Geva, & Schwartz, 2012; Lesaux, Geva, Koda, Siegel, & Shanahan, 2008). However, when measuring overall vocabulary size, across known languages, bilinguals are similar to monolingual peers. Further, code switching, once thought to indicate confusion in bilingual children, has come to be understood as a natural process of developing bilingualism, and therefore needs to be accommodated within optimal learning environments.

Cross-linguistic transfer in literacy development

The above sections focus primarily on the relationship of an identified factor that contributes to literacy with literacy abilities in either English as a second language or an ethnic/heritage language of bilinguals. They did not address the relationships of literacy and its related

skills in bilingual children's two languages, which is the focus of the current section. This section examines the issue of cross-linguistic transfer in bilinguals' literacy development, where transfer is defined as "the influence resulting from similarities and differences between the target language and any other language that has been previously (and perhaps imperfectly) acquired" (Odlin, 1989, p. 27). From an educational perspective, it is important to find out about the role of L1 in L2 literacy acquisition in order to capitalize on what children already know and can readily use in learning to read in a second language. A scrutiny of existing literature suggests that, of all the factors being examined here, phonological awareness, morphological awareness, and vocabulary knowledge tend to lend themselves to cross-linguistic transfer in the context of literacy development. Consequently, we focus on these three factors in our review here.

Biliteracy researchers have generally concurred that metalinguistic awareness can be transferred from one language to facilitate the development of reading and its related skills in the other language (Durgunoglu, 2002; Koda, 2005). Many studies have shown that phonological awareness developed in L1 can be transferred to L2 (see meta-analyses by Branum-Martin, Tao, Garnaat, Bunta, & Francis, 2012 and Melby-Lervag & Lervag, 2011), and can, importantly, contribute directly to L2 literacy achievement. For example, Gottardo, Yan, Siegel, and Wade-Woolley (2001) found that L1 phonological awareness contributed unique variance to L2 word reading for Cantonese ESL learners. A similar cross-linguistic pattern also surfaced in Wang, Park, and Lee (2006) which studied bilingual word reading among Korean–English bilingual children. However, the degree to which phonological awareness transfers between languages, and the extent to which such cross-language transfer contributes to decoding skills often depends on the typological distance between L1 and L2 (McBride-Chang, Bialystok, Chong, Li, 2004; Reddy & Koda, 2012; Swanson, et al., 2004). In reference to English language, phonological awareness in other languages range from moderately to highly correlated (Reddy & Koda, 2012), and transfer of phonological awareness from a first language to English most often occurs from more regular languages (for Italian,

see Campbell & Sais, 1995) or languages with more salient syllable structures (for French, see Bruck & Genesee, 1995), or languages with a more transparent orthography (for Spanish or Hebrew, see Bialystok, Majumder, & Martin, 2003; Bialystok, McBride-Chang, & Luk, 2005).

More recent studies have also documented transfer of morphological awareness in diverse cases of biliteracy development. For example, Ramirez, Chen, Geva, and Kiefer (2010) found that Spanish-speaking ESL learners' Spanish derivational awareness explained a unique and significant proportion of variance in their English word reading, suggesting there was an effect of transfer of morphological awareness. Similarly, Zhang & Koda (in press) found that Chinese compound awareness made a unique contribution to English reading comprehension among young Chinese learners of English as a foreign language. Also focused on young Chinese learners of English as a foreign language, Zhang et al. (2010) found that children who were trained on structures of Chinese compound words performed significantly better than control groups on English compound-word analogy tasks, suggesting an effect of cross-linguistic transfer from Chinese to English, because children applied their insights gained from the intervention to their English compound-word analysis. Focusing on a French immersion programme in Canada, Deacon, Wade-Woolley and Kirby (2007) tracked the development of the children's competence in dealing with past-tense morphology and word reading in the two languages from Grade 1 to Grade 3. They found that early measures of English morphological awareness contributed uniquely to French reading; so did later measures of French morphological awareness to English reading. The findings suggested bidirectional transfer of inflectional awareness, albeit different in pattern at different times, in French–English biliteracy acquisition.

Finally, there is some suggestion that first-language vocabulary skills contribute to reading comprehension in the second language, as has been observed in bilinguals whose languages (e.g., English and Spanish) share *cognates* (words that are orthographically and semantically similar in the two languages). Jiménez et al. (1996)

found that their successful L1 Spanish/L2 English child readers were able to access the cognate vocabulary when needed, which aided in their text comprehension, compared with the less successful readers. The learners in Durgunoglu, Nagy, and Hancin-Bhatt (1993) were found to have varied and limited cognate awareness, but such awareness proved important in learners' second-language reading. Though not focusing on cognate strategies, Carlisle et al. (1999) found that a significant amount of the variance in the English reading comprehension of their Hispanic L2-English learners was explained by the extensiveness of their vocabulary in Spanish (and English), leading the authors to make the recommendation that (among others) vocabulary development in learners' native language ought to receive priority in bilingual education programmes. Despite the evidence available that supports a cross-linguistic relationship of vocabulary knowledge in one language and reading comprehension in the other language, some researchers argue that the correlation between language skills and literacy development may be language-specific only, and linguistic knowledge may not be necessarily transfer-ready in second-language reading or biliteracy development (Lindsey, et al., 2003; Royer & Carlo, 1991).

This section reviewed international research on cross-linguistic transfer in the course of bilingual literacy development. It was found that metalinguistic skills like phonological and morphological awareness can be readily transferred to reading development in the second language, so can certain kinds of vocabulary knowledge. Together with the section above on code switching, the insight from such studies suggests the potentially beneficial value of bilingualism in literacy development (in the sense that developing skills in L1 may contribute to reading ability in L2).

Section 3: Internal Scan

This section includes a summary of research on literacy that was carried out in Singapore. We include mostly published work, but also some projects that were completed as part of dissertation or thesis requirements, as well as ongoing projects at NIE. Findings are arranged according to the ecological systems factors outlined above. In the first part, we outline how external factors, such the

community, school, and home, are related to Singaporean students' literacy skills, in English and/or MTL, and then present a summary of findings of intervention studies with these factors as the focus. In the second part, we first delineate the major findings from studies that addressed how internal factors (i.e., cognitive, linguistic/metalinguistic and metacognitive skills) are related to Singaporean students' literacy abilities. Intervention studies with one or more of these factors as the focus are then reviewed.

External factors: Community, school, and home

Studies relating Singaporean community environment to students' literacy skills

A focus on communal efforts beyond formal curriculum is on literacy acquisition in mother tongue education. Although there is a dearth of high-profile studies in this area, the educational authorities attach great importance to the contribution of community in facilitating mother tongue education, including literacy development. As part of their efforts to enlist help from the local community in the teaching of Chinese mother tongue, the Ministry of Education curriculum developers reached out to various local associations/organizations (e.g., Chinese literary organization, publishers and retailers, Singapore Chinese Chamber of Commerce and Industry and Chinese Clan Associations) for their help in increasing students' exposure to Chinese-language activities outside the school (Chinese Language Curriculum and Pedagogy Review Committee, 2004). In a latest initiative to innovate Mother Tongue education, the educational authorities in Singapore furthered their endeavors to engage the community in second-language acquisition. Efforts to enable schools "to work with the wider community to create environments in and beyond schools that are conducive to MTL [Mother Tongue Languages] learning and use" (Mother Tongue Languages Review Committee Report, 2010), have been supported by the Ministry of Education and the Mother Tongue Languages Promotion Committees over a period of 5 years. One highlight in this respect is to collaborate with communities to organize Mother Tongue Languages Fortnights. This is a good example of the interaction between the micro implementation and macro policy initiative for language-in-education planning described above by Baldauf (2006). Other community-

based activities range from multilingual signage in public places to age-appropriate Chinese language television programmes and public broadcasts, as well as the production of readers (e.g., CPCLL).

According to the preliminary findings of an empirical study (Zhao & Shang, 2013), linguistic landscape within school campus, which is often put up with the support from the wider community, is perceived by teachers as contributing to a favourable environment that exposes students to Chinese script and to enrich their graphic life. For the other two MTL, studies show that communal commitments to promote literacy acquisition also have been widely recognized. Out of these kinds of efforts, Muslim religious schools' (Madrasahs) role in organizing literacy activities in Malay language is worthy of mention (e.g., Mokhtar, 2010; Rustam, Mamat, Abdul Rashid, 2012). All of these instances suggest that the potential of communities' supplementary role in enhancing mother tongue teaching (as a second language) and learner's literacy performance can be further tapped.

Studies relating Singaporean classroom environments to students' English literacy skills

Singapore's Learning Support Programme provides help to primary school children who are struggling with reading skills in English. Teachers in the Learning Support Programme report that many children in the programme come from mother-tongue-dominant homes. However, they are ambivalent about the use of mother tongue as a resource in the teaching of English and those who do believe in the use of mother tongue are unsure of how and when to use it (Vaish, 2012). In current research in Singapore, based on a pilot study, it was found that the use of Malay as a scaffold to teach English increases the talk time of students and allows them to attempt complex, speculative questions about the text which they could not answer when only English was being used in the classroom (Vaish & Subhan, 2014). Cultural affinity may influence the school's curriculum too. Many of the Special Assistance Plan Schools in Singapore are characterized by their strong and dynamic Chinese literacy programmes that seek to fulfill the mission of nurturing bilingual and bicultural students who are steeped in Chinese language and culture.

Studies relating Singaporean bilinguals' home literacy environment to their literacy skills in English

Many qualitative studies were carried out in Singapore focusing on various aspects of home literacy environment and bilinguals' literacy development. They profiled Singaporean children's home literacy environment in relation to their literacy achievements in English and mother tongues (e.g., Curdt-Christiansen, 2012; Mukhlis, 2004; Mukhlis & Koh, 2006; Ren, 2012); cognitive strategies involved in the literacy practices at home (e.g., Dai, 2011; Quek, 2006), how parents adapted parenting style and educational role and goals for preparing their children to school (e.g., Balakrishnan, 2001), as well as collaborations between parents and schools (Bokhost-Heng, 2008).

Contribution from Singaporean bilinguals' home literacy environment to their literacy skills in English and MTL were also reported in quantitative studies at NIE. For example, it was found that Singaporean Chinese children's home literacy environment contributed to their lexical knowledge and vocabulary directly, and also to their reading ability indirectly (Li & Zhang, 2012; Li, Zhang, & Zhao, 2013); and there was a close association between Singaporean Malay children's English home literacy environment and their English phonological awareness, morphological awareness, as well as word-recognition ability (Li, Zhang, Chin, & Khalid Bari, 2013). O'Brien (2013) also found preliminary evidence of a correlation between mother's dominant language and nonlinear measures of English Language reading fluency for Primary 3 to 5 students. Tan (2007) looked into the Singaporean students' performance in the Progress in International Reading Literacy Study (PIRLS, 2001) and also found that Singaporean Grade 4 children's family socioeconomic status, pre-primary literacy, number of books at home and attitude toward reading accounted for about 30% of the variance of their reading achievement.

Literacy intervention studies in Singapore: External factors

This section reviews studies where the focus of intervention is *not* specific to one of the factors identified at the beginning of this paper as a significant correlate or predictor of literacy development, which is

the focus of the next part. Studies that fall into this category are small in number, and they are of diverse nature in design. Most employed a single-group or quasi-experimental design. Randomized-controlled intervention is yet to be implemented. The intervention studies in the present category largely focused on school factors with English as the target language and reading as the focal literacy. Interventions on home and community factors are rare.

Intervention effects have been observed in studies adopting a single-group (i.e., no control group), longitudinal design. Shegar (2009) collected baseline data on practice of reading instruction in primary school English classrooms, and then implemented some innovations (e.g., negotiation with teachers about areas for enhancement, workshops for teachers). The results showed improvement in students' reading abilities even though this effect was not long-lasting. In Chandrasegaran, Kong and Chua's (2007) study on Secondary 3 students' essay-writing skills, it was found that teaching expository genre practices and associated thinking had a positive effect on students' English writing (with regard to overall essay score, essay length, use of framing devices, argument moves, and functional topicality). A drawback with these two studies is the lack of a control or comparison group. It therefore cannot be confirmed whether the observed improvement in performance could be attributed to the intervention itself or was a basic natural, developmental effect.

A few quasi-experimental studies that did include a control group were also conducted in local schools. For example, Silver (2008) examined the extent to which negotiation for meaning, which highlights a process where interlocutors modify their conversational input to improve the comprehensibility of messages, would foster Primary 4 students' English reading comprehension. Compared to the control group receiving no reading instruction, positive treatment effects were found in both the negotiation-for-meaning treatment group and another group receiving traditional instruction in reading comprehension, leading to the suggestion that there is space for re-thinking if negotiation for meaning is indeed different from currently used methods in primary classrooms. Chen, Lin, Xie, Chu, and Tan (2012) investigated whether collaborative learning enhanced by

Group Scribbles, a networked technology, would improve Primary 4 Chinese students' Chinese reading skills. The results showed significantly better performance of the intervention group over the control group, indicating a positive effect of group scribbles-based collaborative learning on Chinese expository text comprehension.

Internal factors: Cognitive, linguistic/metalinguistic, metacognitive underpinnings

Studies relating Singaporean bilinguals' cognitive factors to their literacy skills in English

One report examined narrative fluency and executive functions (Kotov & Lee, 2009), showing strong relations of the executive function of updating with narrative fluency and content, and the executive function of switching with plot construction and encoding of intentions. Similar examination of cognitive skills (executive functions, working memory or speed of processing) related to literacy has yet to be undertaken, to our knowledge.

Studies relating Singaporean bilinguals' metalinguistic factors to their literacy skills

A set of studies performed in Singapore have investigated the relations between metalinguistic knowledge with literacy-based skills. Pang (2003) found very high correlations between English and Chinese phonological awareness measures in second- and third-grade bilingual students. Each of these measures contributed significant, unique variance cross-linguistically to word-reading ability as well, showing that transfer of phonological awareness contributes to reading in both languages. Work by Rickard Liow and colleagues (Rickard Liow, 1999, 2005; Rickard Liow & Lau, 2006; Jalil & Rickard Liow, 2008) demonstrated differences between kindergarten-aged children's English-Language spelling performances and the oral language to which they had been exposed to at home. In brief, speech-based representations, including non-standard forms of phonology, affected spellings of Malay-language children, whereas Chinese-language children were more affected by word frequency and visual word recognition when spelling. This suggested greater transfer of phonological skills for Malay-language children learning English language. Randall (2005) also found that L1 phonology (Chinese

language or Malay language) affected L2 spelling (English language), where different L1 groups showed the same pattern of spelling errors for consonant clusters that do not exist in their respective L1. Further, Dixon (2009, 2011) found that in three L1 groups (Tamil language, Malay language and Chinese language), phonological awareness in English was predicted by English language vocabulary, but that phonological awareness development was also influenced by the orthographic depth and syllabic complexity of children's L1. Finally, Sun (2010) found evidence that morphological awareness (compound) had a direct influence on reading comprehension, besides its effect on vocabulary, and that this morphological awareness knowledge was shared between languages in bilinguals.

Studies relating linguistic factors and literacy skills in Singapore bilinguals

Largely consistent with findings from international research, a few local studies also yielded significant correlations between learners' linguistic skills and their literacy achievement. Dixon, Zhao, and Joshi's (2010) study on Singaporean kindergarteners' early reading achievement found that learners' receptive vocabulary exerted a significant (albeit limited) effect on their word-reading skill. Likewise, Pang (2003) found that vocabulary contributed significant variance intralingually to word reading in both English and Chinese for bilingual readers. Fitriani's (2011) study with Primary 1 pupils revealed a significant role of vocabulary in reading comprehension. Zhang and Anual (2008) investigated the role of vocabulary knowledge in Secondary 4 students' reading comprehension and found significant correlations between the two for 2,000-word and 3,000-word levels of lexical knowledge. Tan (2009) found somewhat surprisingly that for her Primary 1 female pupils, grammar, but not vocabulary, was a significant predictor of reading comprehension. The author attributed the relative importance of grammar in reading comprehension in this study to the possible effect of the non-standard local variety of English (Colloquial Singapore English, also known as Singlish) on reading. Lastly, though not focused on literacy, a series of local studies have also aimed to describe and explain the grammatical system of Colloquial Singapore English addressing such topics as tense and aspect (e.g., Alsagoff,

2001; Bao, 1995, 2005), modality (e.g., Bao, 2010) and syntactic structures (e.g., Alsagoff & Lick, 1998; Alsagoff, Bao, & Wee, 1998; Sato & Kim, 2012), showing among other factors, substratal influences and/or universal tendencies in the formation of Colloquial Singapore English. It is yet to be examined if students' Colloquial Singapore English would have any influence on their learning to read, or reading of printed texts, particularly school materials or other academic texts that are written with standard English grammar. However, Yap and Alsagoff's (2005) study on errors in Singaporean students' English composition did reveal some influence of Colloquial Singapore English on English writing.

Metacognitive factors and bilingual literacy development among Singaporean students

As found with monolingual readers, good and poor bilingual readers in Singapore secondary school differed in their use (although not their knowledge) of metacognitive strategies for text reading (Wong, 2005). In a multi-strand and multi-phase project, Hu, Gu, Zhang, and Bai (2009) examined the effectiveness of strategies-based instruction on improving primary school pupils' use of learning strategies and overall competence for English literacy. The researchers first collected, through think-alouds and questionnaires, baseline data of primary school students' English reading and writing strategies, and then implemented strategies-based reading/writing interventions with a quasi-experimental design. Their baseline questionnaire data showed that across different schools, metacognitive strategies of students were a significant predictor of their school-based test results for reading as well as writing.

Intervention studies in Singapore: Internal factors

Intervention research with the focus on skills that are known predictors of literacy development has been very limited. O'Brien's (2013–2015) project recently approved by OER is, to the best of our knowledge, the only research effort to use a randomized-controlled design to address an intervention effect on local children's literacy development. The project capitalizes on the affordances of iPads in delivering phonics instruction where visual cues to letter-sound correspondences are embedded in digital texts. The text is used in

an iPad application, and the touch-screen scaffolds student learning of letter sounds that are taught in isolation, then immediately embedded within words, and within connected text of short stories. K2 children who come from a Chinese-dominant home language background will be randomly assigned to an experimental condition where the technology-enhanced phonics instructional method is used and a non-reading control condition. Both groups will be pre-tested and post-tested several times, and their performance on various English literacy and its related abilities will be compared to address the effect of the intervention.

Zhang, D. (2011) conducted a one-semester longitudinal intervention study on morphological awareness in Singaporean bilingual children, which is a type of metalinguistic awareness that contributes to learning to read as well as reading to learn. The objective of the study was to examine whether training in English derivation would enhance Primary 4 children's English morphological awareness, word reading, lexical inference and vocabulary knowledge, and reading comprehension. The study also investigated whether children's English morphological awareness would be transferred to word learning and reading in Malay language, which has a productive derivational process, but not in Chinese language, which has an impoverished derivational process.

The study found that the training in English derivation brought about positive effects on children's English learning (including lexical inferencing, word reading and vocabulary), even after controlling for pre-intervention performance. In fact, some effects were sustained for a semester after the intervention. While these results appear promising, it should be noted that the intervention period (i.e., one semester) is relatively short. In addition, the effect sizes tended to be small ($d = .25$ or less). Nevertheless, the study found that morphological awareness was consistently and significantly related to reading comprehension in English, Malay and Chinese language (Zhang & Li, in press).

Regarding intervention focused on linguistic factors, Stinson and Freebody (2005) looked into the use of drama in Secondary 4

students' oral English skills. Their intervention group received 10 one-hour lessons teaching four process dramas in total. Pre- and post-tests on oral English (assessing among others, vocabulary) administered to the intervention and comparison groups yielded significant and across-the-board improvement for the former, and no change for the latter. Though not focusing on English language, Wong's (2009–2011) project aimed to improve primary school pupils' attitudes and competencies in Chinese proverbs by utilizing mobile device-based animations in both formal and informal learning settings. Although neither of these studies focused on literacy outcomes directly, the language skills that were impacted are known to indirectly influence literacy achievement, as has been shown elsewhere.

A few studies had metacognitive factors as the focus of intervention. Hu et al. (2009), which was reviewed earlier, developed a reading and a writing strategies-based intervention programme capitalizing on those strategies that were found closely related to children's reading and writing abilities. The study revealed that children who had experienced focused instruction on English reading/writing strategies developed better strategic competence as well as English reading/writing competence than those who had not.

Zhang, L. (2009) conducted a 2-year longitudinal intervention study on the effects of training Primary 4 children from two schools in self-regulated literacy learning strategies. Examples of self-regulated literacy learning strategies taught in the interventions included: (1) raising students' awareness of the importance of planning before they write, and (2) teaching students how to use graphic organizers to help them plan their writing. The researchers were interested to find out whether training in these strategies would affect the children's bilingual reading and writing development, and if so, how.

Overall, the study found that the self-regulated literacy learning strategies had a positive impact on students' English and Chinese writing performance. Specifically, students who underwent the self-regulated literacy intervention had higher scores in the content, language and organization of their writing, compared to students who did not undergo the intervention, even after controlling for pre-

intervention differences in writing performance (Gong, Zhang, & Zhang, 2011).

Section 4: Implications

From the review of external and internal research focused on our topic of bilingualism and literacy, several key findings resonate across studies. In order to synthesize the external bilingual literature with the local context, several considerations should first be taken into account. Second-language learning is sometimes dichotomized into learning L2 in a foreign-language context versus learning in a L2-majority context, with the primary difference being the degree of exposure to the L2 outside the classroom. School-aged children in Singapore could effectively be considered as operating within an English language-majority context, since they are exposed to English both in school as well as through social interaction with many peers, who also speak English, and through much of media coverage. English as a foreign language would not, in this sense, apply to them. However, depending on their backgrounds and linguistic environments outside of school, some children may actually be considered as foreign-language learners of their MTL – that is, if family and community contacts do not provide exposure to their ethnic mother tongue. Also, as noted up front, there is variation in the degree to which any given child is bilingual, and within any given classroom, children may vary with regard to which languages are L1 and L2. Rather than dichotomize individuals into different types of bilingual categories, we took the approach of examining factors that are correlated with literacy in either the language of instruction (English language, which may be the child's L2 or L1), or mother tongue (Chinese language, Malay language or Tamil language, which again may be the L1 or L2 heritage language). With these considerations in mind, let us look at the summary of the extant literature.

First, community and home environments play an important role in maintenance of non-dominant language(s) in a society, and these indirectly or directly will affect literacy attainment with the non-dominant language. Concerted efforts in Singapore have capitalized on communal influence, including support for pedagogical policy,

linguistic landscape and literacy activities related to MTL within ethnic communities. The positive influence of home literacy activities, like shared reading, are also extended to second-language learning, be it English language or MTL here. Local studies showing home literacy environment contributions to vocabulary knowledge as well as phonological and morphological awareness in English language support the drive for school–home partnerships. One study looked into this partnership, but was limited to adolescents.

School environments are also key to literacy achievement, and the practice of translanguaging was successfully used in a pilot study that scaffolded English language with the use of Malay. Future research on this method as a tool for children in the learning support programme is warranted, with the understanding that the technique should be carefully planned rather than random code switching (Garcia, 2009). Pedagogical enhancements to student comprehension and expository writing may have a positive impact on student performance, although further controlled studies are needed to confirm these results. Technology is another area that may prove fruitful for teaching of reading skills, including MTL such as Chinese. However, use of technology for children under 3 years of age is not recommended, and for children up to 6 years of age technology use should be supervised (Karupiah, 2014).

With regard to cognitive and linguistic factors, metalinguistic awareness (phonological awareness, morphological awareness) and vocabulary knowledge are skills that can be transferred across languages, as amply supported in the research and with local studies on spelling and vocabulary. Direct instruction in English language derivation showed positive effects on English language morphological awareness for Chinese children with limited derivational morphological awareness. Further work on using cross-linguistic transfer for pedagogical practice is warranted. Another area that shows robust contribution to L2 reading performance, particularly comprehension, is metacognition. Several local studies showed that strategy use related to better reading performance, and strategy-based reading and writing programmes and self-regulation strategy training showed positive outcomes for reading and writing performance.

Section 5: Conclusion and Recommendations

In conclusion, there are similarities between bilingual literacy research done internationally and findings from national research based in Singapore. In spite of the complex nature of the linguistic environment of Singapore, with multifaceted differences in what constitutes bilingualism, several take-home messages are possible. These recommendations are posed in light of the goal of the bilingual policy in Singapore, which is the educational outcome of “effective bilingualism” where students learn to speak in both their languages competently. Many high-achieving students will fulfil this expectation, and go on to perform well in Higher MTL coursework as well as other academic subjects (such as at SAP schools, etc.). However, there are two ways this goal may not be met: either through inadequate progress in learning one’s MTL, or inadequate learning of EL. The former case would include students who may be high academic achievers, but who nonetheless struggle with their MTL exams. Accommodations in terms of MTL curriculum have been offered for these students (e.g., the bridging, core and enhancement curricula for CL). The latter would include mostly students categorized as low achievers, considering that limited EL skills would hamper their performance across academic subjects, including Math and the Sciences, with the exception of MTL. Literacy skills are foundational to student learning and achievement. Thus, the following recommendations are made to support the development of students’ EL literacy skills, on the one hand, or MTL literacy skills, on the other hand.

First, with regard to improving literacy outcomes in English language:

1. Home literacy practices, such as EL shared book reading and parent teaching, are recommended at the earliest stages of child development to increase not only print awareness but also oral language skills that contribute to later literacy achievement.
2. While the factors contributing to literacy achievement are largely known, and are consistent between monolingual and bilingual research, these correlates may change developmentally. That is, so-called emergent literacy skills, including alphabetic knowledge and concepts about print, are mastered early on with exposure to

written language, whereas the alphabetic principle and learning specific phoneme-grapheme correspondences (for alphabetic languages) take some time and explicit instruction to master. In addition to single-word decoding, students in early primary grades can begin to focus past the word level to start using additional linguistic skills for meaning making while reading independently (the so-called “reading to learn stage”). These skills are more closely associated with oral language proficiency, and children with language comprehension problems, or problems with automatic decoding, will show declining academic performance at this point – the so-called “fourth-grade slump”. It is also important to consider in this case that L2 oral language proficiency needs to go beyond conversational fluency to include academic language proficiency.

3. Teaching transferrable skills, such as metalinguistic phonological and morphological awareness, is effective for literacy learning and related skills, like vocabulary and word reading fluency. For children first learning to read, phonological awareness and morphological awareness can be applied to their second written language. For ESL students who already learned to read in their L1, this metalinguistic knowledge can be tapped into for teaching them to read in English language, with the caveat that some aspects of phonological awareness and morphological awareness may not be salient in their L1.
4. For ESL students who struggle with learning to read, translanguaging techniques may be useful for teachers. Similarly, the transferrable skill of vocabulary knowledge may be applied, where L1–L2 cognates can aid text comprehension. Drawing out students’ cognate awareness may be a useful technique in cases where the language pairings permit it (e.g., Malay–English).
5. While decoding skills and word reading appear to be readily learned by ESL learners, difficulties with reading comprehension and syntax/grammar in the L2 persist. The teaching of metacognitive strategies, such as self-regulation and monitoring one’s own understanding of the text, have been shown to be effective in improving L2 reading as well as writing. Instruction of grammatical knowledge and inferencing skills, on the other hand, has not received as much attention in the field, so we cannot comment at this point.

Second, with regard to maintaining/acquiring literacy in MTL:

1. Community supports are especially important, with regard to increasing exposure to MTL script and providing resources (library) and out-of-school literacy activities (community-based programmes).
2. Home literacy environment is also key to maintaining/acquiring literacy in the MTL. The same factors that contribute to English language literacy are important for literacy in the heritage language, such as children's reading activities and parental literacy support. These factors contribute to both heritage language literacy and oral language skills like vocabulary, and do not thwart English-language literacy acquisition.

Finally, simultaneous with efforts to improve literacy skills per se, implications for content-area learning also need to be explored.

1. For example, the translanguaging studies indicated above may provide a helpful technique for students falling short of "effective bilingual" status. This means that students who are strong in mother tongue but who do not yet possess the requisite skills in English could benefit from instruction of content subjects delivered partially in the mother tongue, at least as a transitional measure. Other things being equal, learning through one's stronger language better promotes higher order thinking (Morrison & Lui, 2000), and leads to stronger academic motivation and commitment to learning and understanding (Education Department [Hong Kong], 1994, as cited in Morrison & Lui, 2000). In comparing the postcolonial classroom practice in two contexts, Botswana and Brunei, Arthur and Martin (2006) observed that the former approximates an English-only teaching environment and they warn that such practice may "restrict broader learning opportunities" for pupils who do not possess uniform levels of English (p. 197). Hence, it is worth considering offering appropriate support in the teaching of content subjects for linguistically disadvantaged students in Singapore. However, issues remain with regard to how to scaffold such cross-language support (or how and when to reduce cross-language cues). Though there does not seem to be explicit

literature on this point, we believe that, at least on the issue of when to provide/withdraw such support, continuous assessment of *individual* students' EL proficiency would provide important information for such decision making. Assessment should consider *academic* as opposed to merely *conversational* proficiency as well (Cummins, 1979). It was noted that for Singapore, it may be necessary to segment groups of students with various language strengths (MTL, EL or a different language) and examine different strategies to address their specific needs. Such information could contribute to teacher training.

2. Other considerations include how to construct the most beneficial learning environments for different types of learners. For instance, universal design for learning principles suggest that content should be offered to students in multiple formats (e.g., oral, written, visual, verbal). Could these principles be extended to Singaporean classrooms, where materials could be available in multiple languages so that all types of bilingual students could access the material in a format that best promotes their understanding? This would not only increase access for different types of learners, but may also promote bilingual learning rather than limiting MTL to a subject area. We understand that SAP schools are already teaching certain subjects in the mother tongue (Chinese). This recommendation for the provision of multilingual materials for content learning could therefore be considered for non-SAP schools that are interested in helping students who are weak in English to learn non-MT subjects and also students who wish to have more exposure to the mother tongue. In the latter scenario, students who have learned the subject content in English would have the chance of acquiring the corresponding terms and expressions in the mother tongue, relatively effortlessly, considering that they will already know the meaning of those words/expressions. Along this line, it would be beneficial to develop a better understanding of student motivation: e.g., what motivates Higher MT students to learn their MT on the one hand; and whether language barriers contribute to low achievement for NT students, on the other hand.
3. Regarding proficiency descriptors that have been developed for MTL assessments, how can these be used with more formative

assessments or for progress monitoring? Currently, it seems that students' MTL proficiency is assessed at relatively long intervals. In order to gain a better understanding of students' evolving linguistic profile, it may be beneficial to perform such assessment on a more continuous basis, to facilitate learner-sensitive placement into or exit out of different levels of language classes (e.g., bridging, enhancement, and core modules for Chinese language). It was also noted that currently there are no tools for assessing reading difficulties separately from language barriers. This would be important for teachers to have, particularly at key educational transition points, such as primary and secondary entry.

References

- Abu-Rabia, S., Share, D., & Mansour, M. S. (2003). Word recognition and basic cognitive processes among reading-disabled and normal readers in Arabic. *Reading and Writing: An Interdisciplinary Journal*, 16, 423–442.
- Alderson, J. C. (1993). The relationship between grammar and reading in English for academic purposes test battery. In D. Douglas & C. Chapelle (Eds.), *A new decade of language testing research: Selected papers from the 1990 Language Testing Research Colloquium* (pp. 203–219). Alexandria, VA: TESOL.
- Alsagoff, L. (2001). Tense and aspect in Singapore English. In V. B. Y. Ooi (Ed.), *Evolving identities. The English language in Singapore and Malaysia* (pp. 79–88). Singapore: Times Academic Press.
- Alsagoff, L., Bao, Z., & Wee, L. (1998). Why you talk like that?: The pragmatics of a why construction in Singapore English. *English world-wide*, 19, 247–260.
- Alsagoff, L., & Lick, H. C. (1998). The relative clause in colloquial Singapore English. *World Englishes*, 17, 127–138.
- Aram, D. & Levin, I. (2001). Mother-child joint writing in low SES: Socio-cultural factors, maternal mediation and emergent literacy. *Cognitive Development*, 16, 831–52.
- Arthur, J., & Martin, P. (2006). Accomplishing lessons in postcolonial classrooms: comparative perspectives from Botswana and Brunei Darussalam. *Comparative Education*, 42(2), 177–202.
- Baddeley, A. D. (2003). Working memory: Looking back and looking forward. *Neuroscience*, 4, 829–839.

- Baddeley, A. D., Gathercole, S. E., & Papagno, C. (1998). The phonological loop as a language learning device. *Psychological Review*, 105(1), 158–173.
- Balakrishnan, S. K. (2001). *Home literacy practices and perceptions of Indian families: Case studies of four families in Singapore* (Unpublished master's thesis). National Institute of Education, Singapore.
- Baldauf, R. B. Jr. (2006). Rearticulating the Case for Micro Language Planning in a Language Ecology Context. *Current Issues in Language Planning*, 7(2-3), 147–170.
- Bao, Z. (1995). Already in Singapore English. *World Englishes*, 14, 181–188.
- Bao, Z. (2005). The aspectual system of Singapore English and the systemic substratist explanation. *Journal of Linguistics*, 41, 237–267.
- Bao, Z. (2010). Must in Singapore English. *Lingua*, 120, 1727–1737.
- Barnes, M. A., Dennis, M., & Haefele-Kalvaitis, J. (1996). The effects of knowledge availability and knowledge accessibility on coherence and elaborative inferencing in children from six to fifteen years of age. *Journal of Experimental Child Psychology*, 61, 216–241.
- Baumann, J. F., Seifert-Kessell, N., & Jones, L. A. (1992). Effect of think-aloud instruction on elementary students' comprehension monitoring abilities. *Journal of Literacy Research*, 24(2), 143–172.
- Beck, I. L., Perfetti, C. A., & McKeown, M. G. (1982). Effects of long-term vocabulary instruction on lexical access and reading comprehension. *Journal of Educational Psychology*, 74, 506–521.
- Bialystok, E. (2002). Acquisition of literacy in bilingual children: A framework for research. *Language Learning*, 52(1), 159–199.
- Bialystok, E., Majumder, S., & Martin, M. M. (2003). Developing phonological awareness: Is there a bilingual advantage? *Applied Psycholinguistics*, 24, 27–44.
- Bialystok, E., McBride-Chang, C., & Luk, G. (2005). Bilingualism, language proficiency, and learning to read in two writing systems. *Journal of Educational Psychology*, 97, 580–590.
- Biemiller, A. (2005). Size and sequence in vocabulary development: Implications for choosing words for primary grade vocabulary instruction. In E. H. Hiebert & M. L. Kamil (Eds.), *Teaching and learning vocabulary: Bringing research to practice* (pp. 223–242) Mahwah, NJ: Erlbaum.
- Bokhorst-Heng, W. (2008). School-home partnerships to nurture adolescent literacy. *Middle School Journal*, 39, 40–49.
- Bowers, P. N., Kirby, J. R., & Deacon, S. H. (2010). The effects of morphological instruction on literacy skills A systematic review of the literature. *Review of Educational Research*, 80(2), 144–179.

- Branum-Martin, L., Tao, S., Garnaat, S., Bunta, F., & Francis, D. J. (2012). Meta-analysis of bilingual phonological awareness: Language, age, and psycholinguistic grain size. *Journal of Educational Psychology, 104*, 932–944.
- Brisk, M. E. & Harrington, M. M. (2006). *Literacy and bilingualism: A handbook for all teachers*. Mahwah, N.J.: Lawrence Erlbaum Associates.
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.
- Bruck, M., & Genesee, F. (1995). Phonological awareness in young second language learners. *Journal of Child Language, 22*, 307–324.
- Cain, K., & Oakhill, J. V. (1999). Inference making and its relation to comprehension failure. *Reading & Writing, 11*, 489–503.
- Cain, K., Oakhill, J., & Bryant, P. (2004). Children's reading comprehension ability: Concurrent prediction by working memory, verbal ability, and component skills. *Journal of educational psychology, 96*(1), 31.
- Campbell, R., & Sais, E. (1995). Accelerated metalinguistic (phonological) awareness in bilingual children. *British Journal of Developmental Psychology, 13*, 61–68.
- Carlisle, J. F. (2003). Morphology matters in learning to read: A commentary. *Reading Psychology, 24*(3-4), 291–322.
- Carlisle, J. F. (2010). Effects of instruction in morphological awareness on literacy achievement: *An integrative review*. *Reading Research Quarterly, 45*(4), 464–487.
- Carlisle, J. F., Beeman, M., Davis, L. H., & Spharim, G. (1999). Relationship of metalinguistic capabilities and reading achievement for children who are becoming bilingual. *Applied Psycholinguistics, 20*, 459–478.
- Carlo, M. S., August, D., Mclaughlin, B., Snow, C. E., Dressler, C., Lippman, D., Lively, T., White, C. E. (2004). Closing the gap: addressing the vocabulary needs of English-language learners in bilingual and mainstream classrooms. *Reading Research Quarterly, 39*, 188–215.
- Carrell, P. L. (1989). Metacognitive awareness and second language reading. *The modern language journal, 73*(2), 121–134.
- Carrell, P. L., Pharis, B. G., & Liberto, J. C. (1989). Metacognitive strategy training for ESL reading. *Tesol Quarterly, 23*(4), 647–678.
- Celano, D. & Neuman, S. B. (2013). *The Role of Public Libraries in Children's Literacy Development: An Evaluation Report*. Retrieved from <http://www.ifpl.org/Junior/studies/Role%20of%20Libraries.pdf>.
- Chandrasegaran, A., Kong, C. K. M., and Chua, D. F. (2007). *Intervention in the teaching of expository writing*. Project No. CRP 5/04 AC. Retrieved from <http://hdl.handle.net/10497/174>

- Chen, X., Geva, E. & Schwartz, M. (2012). Understanding literacy development of language minority students: an integrative approach. *Reading and Writing, 25*, 1797–1804.
- Chen, W., Lin, C., Xie, W., Chu, C. & Tan, Y. L. (2012). *Group Scribbles-Enhanced Collaborative Learning Improves Reading Skills: An Experiment Study in Primary Classrooms*. Proceedings of the 20th International Conference on Computers in Education. Singapore: Asia-Pacific Society for Computers in Education.
- Chinese Language Curriculum and Pedagogy Review Committee (2004). *Report of Chinese language teaching and learning in Singapore*. Singapore: Ministry of Education.
- Chiu, M. M., & McBride-Chang, C. (2006). Gender, context, and reading: A comparison of students in 43 countries. *Scientific Studies of Reading, 10*, 331–362.
- Cohen, A. D. (1998). *Strategies in learning and using a second language*. London: Longman.
- Cooper, R. L. (1989). *Language Planning and Social Change*. Cambridge, U.K.: Cambridge University Press.
- Creese, A., & Blackledge, A. (2010). Translanguaging in the bilingual classroom: A pedagogy for learning and teaching? *The Modern Language Journal, 94*, 103–115.
- Cummins, J. (1979). *Cognitive/academic language proficiency, linguistic interdependence, the optimum age question and some other matters, Working Papers on Bilingualism 19*, 121–129.
- Cummins, J. (2012). The intersection of cognitive and sociocultural factors in the development of reading comprehension among immigrant students. *Reading and Writing, 25*:8, 1973–1990.
- Curdt-Christiansen, X. L. (2012). Implicit learning and imperceptible influence: Syncretic literacy of multilingual Chinese children. *Journal of Early Childhood Literacy*, DOI: 10.1177 /1468798412455819
- Dai, C. (2011). *Chinese middle-class mothers' scaffolding strategies during shared book reading interactions with their young children* (Unpublished master's thesis). National Institute of Education, Singapore.
- Deacon, S. H., Wade-Woolley, L., & Kirby, J. B. (2007). Crossover: The role of morphological awareness in French immersion children's reading. *Developmental Psychology, 43*, 732–746.
- de Abreu, P. M. J. E., Gathercole, S. E., & Martin, R. (2011). Disentangling the relationship between working memory and language: The roles of short-term storage and cognitive control. *Learning and Individual Differences, 21*, 569–574.

- de Graaff, S., Bosman, A. M. T., Hasselman, F., & Verhoeven, L. (2009). Benefits of systematic phonics instruction. *Scientific Studies of Reading, 13*, 318–333.
- de Jong, P. F., & van der Leij, A. (1999). Specific contributions of phonological abilities to early reading acquisition: Results from a Dutch latent variable longitudinal study. *Journal of Educational Psychology, 91*, 450–476.
- Dixon, L. Q. (2009). Assumptions behind Singapore's language-in-education policy: Implications for language planning and second language acquisition. *Language Policy, 8*, 117–137.
- Dixon, L. Q. (2011). The role of home and school factors in predicting English vocabulary among bilingual kindergarten children in Singapore. *Applied Psycholinguistics, 32*, 141–168.
- Dixon, L. Q., Zhao, J., & Joshi, R. (2010). Influence of L1 Orthography on Spelling English Words by Bilingual Children: A Natural Experiment Comparing Syllabic, Phonological, and Morphosyllabic First Languages. *Learning Disability Quarterly, 33*(3), 211–221.
- Dole, J. A., Duffy, G. G., Roehler, L. R., & Pearson, P. D. (1991). Moving from the old to the new: Research on reading comprehension instruction. *Review of Educational Research, 61*(2), 239–264.
- Dufva, M., & Voeten, M. J. M. (1999). Native language literacy and phonological memory as prerequisites for learning English as a foreign language. *Applied Psycholinguistics, 20*, 329–348.
- Durgunoglu, A. Y. (2002). Cross-linguistic transfer in literacy development and implications for language learners. *Annals of Dyslexia, 52*, 189–204.
- Durgunoglu, A. Y., Nagy, W. E., & Hancin-Bhatt, B. J. (1993). Cross language transfer of phonological awareness. *Journal of Educational Psychology, 85*, 453–465.
- Duursma, E., Romero-Contreras, S., Szuber, A., Proctor, P., Snow, C., August, D. & Calderon, M. (2007). The role of home literacy and language environment on bilinguals' English and Spanish vocabulary development. *Applied Psycholinguistics, 28*, 171–190.
- Education Department (1994). *Research on Change of Medium of Instruction in Secondary Schools*. Hong Kong: Government Printer.
- Escribano, C. L. (2007). Evaluation of the double-deficit hypothesis subtype classification of readers in Spanish. *Journal of Learning Disabilities, 40*, 319–331.
- Fitriani (2011). *Phonology, receptive vocabulary, rapid automated naming and reading achievement* (Unpublished master's thesis). National Institute of Education, Singapore.
- Flavell, J. H. (1979). Speculations about the nature and development of metacognition. In F. Weinert & R. Kluwe (Eds.), *Metacognition, motivation, and understanding* (pp. 21–29) Hillsdale, NJ: Erlbaum.

- Fraser, C. (1999). Lexical processing strategy use and vocabulary learning through reading, *Studies in Second Language Acquisition*, 21, 225–41.
- Garcia, O. (2009). *Bilingual education in the 21st century: A global perspective*. Malden, MA: Wiley-Blackwell.
- Gee, J. P. (1989). What is literacy? *Journal of Education*, 171, 1–25.
- Georgiou, G. K., Parrila, R., & Papadopoulos, T. C. (2008). Predictors of word decoding and reading fluency in English and Greek: A cross-linguistic comparison. *Journal of Educational Psychology*, 100, 566–580.
- Geva, E. (2006). Second-language oral proficiency and second-language literacy. In D. August & T. Shanahan (Eds.), *Developing literacy in second-language learners: Reports of the National Literacy Panel on Language – Minority children and youth* (pp. 123–139). Mahwah, NJ: Erlbaum.
- Geva, E., Yaghoub-Zadeh, Z., & Schuster, B. (2000). Understanding individual differences in word recognition skills of ESL children. *Annals of Dyslexia*, 50, 123–154.
- Gong, W. G., Zhang, L. J., & Zhang, D. L. (2011). *Fostering Singaporean Schoolchildren's English-Chinese Bilingual Writing Learning through Self-Regulated Writing Strategy Instruction*. Paper presented at the 4th Redesigning Pedagogy Conference, 31 May – 1 June 2011, Singapore.
- Goodwin, A. P., & Ahn, S. (2010). A meta-analysis of morphological interventions: Effects on literacy achievement of children with literacy difficulties. *Annals of Dyslexia*, 60(2), 183–208.
- Gort, M., & Pontier, R. W. (2013). Exploring bilingual pedagogies in dual language preschool classrooms. *Language and Education*, 27(3), 223–245.
- Goswami, U., & Bryant, P. (1990). *Phonological skills and learning to read*. New York: Psychology Press Ltd.
- Gottardo, A., & Mueller, J. (2009). Are first-and second-language factors related in predicting second-language reading comprehension? A study of Spanish-speaking children acquiring English as a second language from first to second grade. *Journal of Educational Psychology*, 101(2), 330.
- Gottardo, A., Yan, B., Siegel, L. S., & Wade-Woolley, L. (2001). Factors related to English reading performance in children with Chinese as a first language: More evidence of cross-language transfer of phonological processing. *Journal of Educational Psychology*, 93, 530–542.
- Gough, P. B. & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education*, 7, pp. 6–10.
- Hannon B., & Daneman M. (2001). A new tool for measuring and understanding individual differences in the component processes of reading comprehension. *Journal of Educational Psychology*, 93, 103–128.

- Haynes, M., & Carr, T. H. (1990). Writing system background and second language reading: A component skills analysis of English reading by native speaker-readers of Chinese. In T. Carr & B. A. Levy (Eds.), *Reading and its development: Component skills approaches* (pp. 375–421). San Diego, CA: Academic Press.
- Ho, C. S. H., Chan, D. W. O., Lee, S. H., Tsang, S. M., & Luan, V. H. (2004). Cognitive profiling and preliminary subtyping in Chinese developmental dyslexia. *Cognition*, *91*(1), 43–75.
- Hoover, W. A. & Gough, P.B. (1990). The simple view of reading. *Reading and Writing: An Interdisciplinary Journal*, *2*, 127–160.
- Hopewell, S. (2011). Leveraging bilingualism to accelerate English reading comprehension. *International Journal of Bilingual Education and Bilingualism*, *14*, 603–620.
- Hornberger, N. H. (2003). *Continua of biliteracy: An ecological framework for educational policy, research and practice in multilingual settings*. Clevedon, UK: Multilingual Matters.
- Hornberger, N. H., & Link, H. (2012). Translanguaging and transnational literacies in multilingual classrooms: A biliteracy lens. *International Journal of Bilingual Education and Bilingualism*, *15*, 261–278.
- Hu, G. W., Gu, Y. P., Zhang, L. J., & Bai, R. (2009). *English language learning strategies in Singapore primary school* (Final Project Report). Centre for Research in Pedagogy and Practice, National Institute of Education, Nanyang Technological University.
- Jalil, S. B., & Rickard Liow, S. J. (2008). How does home language influence early spellings? Phonologically plausible errors of diglossic Malay children. *Applied Psycholinguistics*, *29*(04), 535–552.
- Jiménez, R. T., García, G. E., & Pearson, P. D. (1996). The reading strategies of bilingual Latina/o students who are successful English readers: Opportunities and obstacles. *Reading Research Quarterly*, *31*, 90–112.
- Kalia, V., & Reese, E. (2009). Relations between Indian children's home literacy environment and their English oral language and literacy skills. *Scientific Studies of Reading*, *13*(2), 122–145.
- Kaplan, R. B. & Baldauf, R. B. Jr. (2003). *Language and Language in Education Planning in the Pacific Basin*. Dordrecht: Kluwer Academic.
- Karuppiah, N. (2014). Computer habits and behaviours among young children in Singapore. *Early Child Development and Care*, DOI: 10.1080/03004430.2014.930451.
- Kieffer, M. J., & Lesaux, N. K. (2008). The role of derivational morphology in the reading comprehension of Spanish-speaking English language learners. *Reading and Writing*, *21*(8), 783-804.

- Kintsch, W. & Rawson, K. A. (2008) Comprehension. In M. J. Snowling and C. Hulme (Eds), *The Science of Reading: A Handbook* (pp. 211–226). Blackwell Publishing Ltd, Oxford, UK.
- Klauda, J. T., & Guthrie, S. L. (2008). Relationships of three components of reading fluency to reading comprehension. *Journal of Educational Psychology, 100*, 310–321.
- Kobayash, M. S., Haynes, C. W., Macaruso, P., Hook, P. E., & Kato, J. (2005). Effects of mora deletion, nonword repetition, rapid naming, and visual search performance on beginning reading in Japanese. *Annals of Dyslexia, 55*(1), 105–128.
- Koda, K. (2005). *Insights into second language reading*. New York: Cambridge University Press.
- Kolić-Vehovec, S., & Bajšanski, I. (2007). Comprehension monitoring and reading comprehension in bilingual students. *Journal of Research in Reading, 30*(2), 198–211.
- Kotov, R. & Lee, K. (2009). *Age and individual differences in language abilities: From kindergarten to secondary school*. Final Research Report, Project No. CRP 05/06 KL, CRP 05/07 KL.
- Kuo, L. J., & Anderson, R. C. (2006). Morphological awareness and learning to read: A cross-language perspective. *Educational Psychologist, 41*(3), 161–180.
- Kuo, L. J., & Anderson, R. C. (2012). Effects of early bilingualism on learning phonological regularities in a new language. *Journal of Experimental Child Psychology, 111*, 455–467.
- Landerl K., Ramus F., Moll K., Lyytinen H., Leppänen P. H., Lohvansuu K.,..., & Schulte-Körne G. (2012). Predictors of developmental dyslexia in European orthographies with varying complexity. *Journal of Child Psychology and Psychiatry*, DOI: 10.1111/jcpp.12029.
- Lantolf, J. P., & Appel, G. (1994). *Vygotskian approaches to second language research*. Westport, CT: Ablex.
- Laufer, B. (1992). How much lexis is necessary for reading comprehension. *Vocabulary and Applied Linguistics, 3*, 16–323.
- Leong, C. K., Chen, P. W., & Tan, L. H. (2005). The role of sensitivity to rhymes, phonemes and tones in reading English and Chinese pseudowords. *Reading and Writing, 18*, 1–26.
- Lesaux, N.K., Geva, E., Koda, K., Siegel, L. & Shanahan, T. (2008). Development of literacy in second-language learners. In D. August & T. Shanahan (Eds.), *Developing reading and writing in second-language learners* (pp. 27–60), New York: Routledge.
- Li, L., & Zhang, D. (2012). *Home literacy environment and bilingual children's Chinese and English vocabulary knowledge development*.

Paper presented at the Fourth Annual Asian Conference on Education, Osaka, Japan.

- Li, L., Zhang, D., Chin, C. F., & Khalid Bari, M. (2013). *Home literacy environment and English reading related skills among Malay children in Singapore*. Paper accepted for presentation at the Redesigning Pedagogy International Conference 2013, Singapore.
- Li, L., Zhang, D., & Zhao, S. (2013). Singaporean Chinese children's home literacy environment and its influence on Chinese lexical knowledge and reading comprehension. *Journal of Chinese Language Teaching*, 10(4), 109-130
- Lin, A. M. Y. (1999) Resistance and Creativity in English Reading Lessons in Hong Kong. *Language, Culture and Curriculum*, 12, 285–296.
- Lindsey, K. A., Manis, F. R., & Bailey, C. E. (2003). Prediction of first-grade reading in Spanish- speaking English-language learners. *Journal of Educational Psychology*, 95, 482–494.
- Lo, Y. Y., & Macaro E. (2012). The medium of instruction and classroom interaction: evidence from Hong Kong secondary schools. *International Journal of Bilingual Education and Bilingualism*, 15(1), 29–52.
- Long, D. L., Oppy, B. J., & Seely, M. R. (1997). Individual differences in readers' sentence- and text-level representations. *Journal of Memory & Language*, 36, 129–145.
- Lonigan, C. J. (2006). Conceptualizing phonological processing skills in preread- ers. In D. K. Dickinson & S. B. Neuman (Eds.), *Handbook of early literacy research* (Vol. 2, pp. 77–89). New York: Guilford Press.
- Low, P. B., & Siegel, L. S. (2005). A comparison of the cognitive processes underlying reading comprehension in native English and ESL speakers. *Written Language & Literacy*, 8, 207–223.
- Lories, G., Dardenne, B., & Yzerbyt, V. Y. (1998). From social cognition to metacognition. In V. Y. Yzerbyt, G. Lories, & B. Dardenne (Eds.) *Metacognition: Cognitive and social dimensions* (pp. 1–15), SAGE Publications Limited.
- Lü, C. & Koda, K. (2011). The impact of home language and literacy support on English-Chinese biliteracy acquisition among Chinese heritage language learners. *Heritage Language Journal*, 8, 44-79.
- Lyon, G. R., Shaywitz, S. E., & Shaywitz, B. A. (2003). A definition of dyslexia. *Annals of Dyslexia*, 53(1), 1–14.
- Martin, P.W. (2003) Interactions and Inter-relationships Around Text: Practices and Positionings in a Multilingual Classroom in Brunei. *International Journal of Bilingual Education and Bilingualism*, 6(3–4), 185–201.

- Masoura, E. V., & Gathercole, S. E. (2005). Contrasting contributions of phonological short-term memory and long-term knowledge to vocabulary learning in a foreign language. *Memory, 13*, 422–429.
- McBride-Chang, C., Bialystok, E., Chong, K. K. Y., & Li, Y. (2004). Levels of phonological awareness in three cultures. *Journal of Experimental Child Psychology, 89*, 93–111.
- McBride-Chang, C., Cho, J. R., Liu, H., Wagner, R. K., Shu, H., Zhou, A., ... & Muse, A. (2005). Changing models across cultures: Associations of phonological awareness and morphological structure awareness with vocabulary and word recognition in second graders from Beijing, Hong Kong, Korea, and the United States. *Journal of Experimental Child Psychology, 92*(2), 140–160.
- McBride-Chang, C., Shu, H., Chan, W., Wong, T., Wong, A.M.Y., Zhang, Y., Pan, J. & Chan, P. (2013). Poor readers of Chinese and English: Overlap, stability, and longitudinal correlates. *Scientific Studies of Reading, 17*(1), 57–70.
- Melby-Lervag, M., & Lervag, A. (2011). Cross-linguistic transfer of oral language, decoding, phonological awareness and reading comprehension: A meta-analysis of the correlational evidence. *Journal of Research in Reading, 34*(1), 114–135.
- Mokhtar, I. A. (2010). Madrasahs in Singapore: Bridging between their Roles, Relevance and Resources. *Journal of Muslim Minority Affairs, 30*(1), 111–125.
- Morrison, K., & Lui, I. (2000). Ideology, Linguistic Capital and the Medium of Instruction in Hong Kong. *Journal of Multilingual and Multicultural Development, 21*(6), 471–486.
- Mother Tongue Languages Review Committee Report (2010). “Nurturing active learners and proficient users”, Ministry of Education. Retrieved November 6, 2012, from <http://www.moe.gov.sg/media/press/files/2011/mtl-review-report-2010.pdf>
- Mukhlis A. B. (2004). *Malay children's lived experience of literacy* (Research Proposal for Project No. CRP 26/03 MAB & 19/04 MAB). Retrieved from National Institute of Education website: <http://www.nie.edu.sg/research-projects/malay-childrens-lived-experience-literacy>
- Mukhlis A. B., & Koh, G. H. (2006). *Chinese children's lived experience of literacy* (Research Proposal for Project No. CRP 12/06 MAB). Retrieved from National Institute of Education website: <http://www.nie.edu.sg/research-projects/chinese-childrens-lived-experience-literacy>.
- Muter, V., Hulme, C., Snowling, M. J., & Stevenson, J. (2004). Phonemes, rimes, vocabulary, and grammatical skills as foundations of early reading

- development: Evidence from a longitudinal study. *Developmental Psychology*, 40, 665–681.
- Nagy, W. E., & Anderson, R. C. (1999). Metalinguistic Awareness. *Literacy: An International Handbook*, 155.
- Nagy, W., Berninger, V., & Abbott, R. (2006). Contributions of morphology beyond phonology to literacy outcomes of upper elementary and middle-school students. *Journal of Educational Psychology*, 98, 134–147.
- Nagy, W. E., & Scott, J. A. (2000). Vocabulary processes. In M. L. Kamil, P. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 269–284). Mahwah, NJ: Earlbaum.
- Nassaji, H. (2003). L2 Vocabulary Learning from Context: Strategies, Knowledge Sources, and Their Relationship with Success in L2 Lexical Inferencing. *TESOL Quarterly*, 37(4), 645–670.
- National Governors Association Center for Best Practices, Council of Chief State School Officers. (2010). *Common Core State Standards for English Language Arts*. Washington, DC: Author.
- Oakhill, J. (1993). Children's difficulties in reading comprehension. *Educational Psychology Review*, 5(3), 223-237.
- O'Brien, B. A. (2013). *Silent reading fluency: Relations between oral language and literacy*. Paper accepted for presentation at the Redesigning Pedagogy International Conference, Singapore.
- O'Brien, B. A. (2013-2015). *Early bilingual experience and English literacy acquisition: An approach to phonics instruction*. (#OER 58/12 OBA). Project funded by Office of Education Research, NIE.
- Odlin, T. (1989). *Language transfer: Cross-linguistic influence in language learning*. New York, NY: Cambridge University Press.
- O'Shea, L. J., & Sindelar, P. T. (1983). The Effects of Segmenting Written Discourse on the Reading Comprehension of Low- and High-Performance Readers. *Reading Research Quarterly*, 18, 458–465.
- Pae, H. K., & Sevcik, R. A. (2011). The role of verbal working memory in second language reading fluency and comprehension: A comparison of English and Korean. *International Electronic Journal of Elementary Education*, 4(1), 47–65.
- Pang, S. H. E. (2003). Cross-linguistic transfer of reading skills in bilingual children. (Unpublished doctoral dissertation). Stanford University, USA.,
- Paribakht, S., & Wesche, M. (1999). Reading and “incidental” L2 vocabulary acquisition: An introspective study of lexical inferencing. *Studies in Second Language Acquisition*, 21, 195–224.
- Pearson, P. D., & Fielding, L. (1991). Comprehension instruction. In R. Barr, M. L. Kamil, P. B. Mosenthal, & P. D. Pearson (Eds.), *Handbook of reading research: Volume II* (pp. 815–860). White Plains, NY: Longman.

- Peregoy, S. (1989). Relationships between second language oral proficiency and reading comprehension of bilingual fifth grade students. *NABE: The Journal of the National Association for Bilingual Education*, 13, 217–34.
- Peregoy, S., & Boyle, O. F. (1991). Second language oral proficiency characteristics of low, intermediate, and high second language readers. *Hispanic Journal of Behavioral Sciences*, 13, 35–47.
- Perfetti, C. A., Landi, N. & Oakhill, J. (2007). The acquisition of reading comprehension skill. In M.J. Snowling & C. Hulme (Eds.), *The Science of Reading: A Handbook* (pp. 227–247).
- Pinker, S. (1994). *The language instinct: How the mind creates language*. New York: Harper Collins Publishers.
- Pressley, M. (2000). What should comprehension instruction be the instruction of? In M. Kamil, P. Mosenthal, P. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 545–561). Mahwah, NJ: Erlbaum.
- Pressley, M. (2002). Effective beginning reading instruction. *Journal of Literacy Research*, 34(2), 165–188.
- Pressley, M. (2006). *Reading instruction that works: The case for balanced teaching*. The Guilford Press.
- Proctor, C. P., Carlo, M., August, D., & Snow, C. (2005). Native Spanish-Speaking Children Reading in English: Toward a Model of Comprehension. *Journal of Educational Psychology*, 97(2), 246.
- Proctor, C.P., Silverman, Haring, J., & Montecillo, C. (2012). The role of vocabulary depth in predicting reading comprehension among English monolingual and Spanish-English bilingual children in elementary school. *Reading and Writing*, 25(7), 1635–1664.
- Protopapas, A., Mouzaki, A., Sideridis, G. D., Kotsolakou, A., & Simos, P. G. (2013). The role of vocabulary in the context of the simple view of reading. *Reading & Writing Quarterly*, 29, 168–202.
- Pucci, S. L. (1994) Supporting Spanish language literacy: Latino children and free reading resources in schools. *The Journal of the National Association for Bilingual Education*, 18(1–2), 67–82.
- Quek, E. E. L. (2006). *An exploratory study of joint book reading with young children and caregivers* (Unpublished master's thesis). National Institute of Education, Singapore.
- Ramirez, G., Chen, X., Geva, E., & Kiefer, H. (2010). Morphological awareness in Spanish-speaking English language learners: Within and cross-language effects on word reading. *Reading and Writing*, 23, 337–358.
- Randall, M. (2005). Orthographic knowledge and first language reading: Evidence from single word dictation from Chinese and Malaysian users of English as a foreign language. In V. Cook & B. Bassetti

- (Eds.), *Second language writing systems*, (pp. 122–146). Clevedon: Multilingual Matters.
- Reddy, P. P. & Koda, K. (2012). Orthographic constraints on phonological awareness in biliteracy development. *Writing Systems Research*, DOI: 10.1080/17586801.2012.748639.
- Ren, L. (2012). *Home biliteracy practices and biliteracy acquisition: A comparative study of Singaporean Chinese families and recent immigrant families from China* (Unpublished master's thesis). National Institute of Education, Singapore.
- Rickard Liow, S. J. (1999). Reading skill development in bilingual Singaporean children. In M. Harris & G. Hatano (Eds.), *Learning to read and write: A cross-linguistic perspective* (pp. 196–213). Cambridge, England: Cambridge University Press.
- Rickard Liow, S. J. (2005). Home language influences literacy development. *Innovation*, 5(3), 28–29.
- Rickard Liow, S. J., & Lau, L. H. S. (2006). The Development of Bilingual Children's Early Spelling in English. *Journal of Educational Psychology*, 98(4), 868–878.
- Royer, J. M., & Carlo, M. S. (1991). Transfer of comprehension skills from native to second language. *Journal of Reading*, 34, 450–455.
- Ruan, J. (2004). Bilingual Chinese/English first-graders developing metacognition about writing. *Literacy*, 38(2), 106–112.
- Rustam, N., Mamat, A. & Abdul Rashid, A. (2012). Teaching methodologies in a weekend madrasah: A study at Jamiyah Education Centre, Singapore. *International Journal of Arts and Commerce (IJAC)*, 1(2), 148–167.
- Sato, Y., & Kim, C. (2012). Radical pro drop and the role of syntactic agreement in Colloquial Singapore English. *Lingua*, 122, 858–873.
- Schwartz, M., & Katzir, T. (2012). Depth of lexical knowledge among bilingual children: The impact of schooling. *Reading and Writing*, 25(8), 1947–1971.
- Sénéchal, M. & Lefevre, J. A. (2002). Parental involvement in the development of children's reading skill: A five-year longitudinal study. *Child Development*, 73, 445–460.
- Sénéchal, M. & Young, L. (2008). The effect of family literacy interventions on children's acquisition of reading from kindergarten to grade 3: A meta-analytic review. *Review of Educational Research*, 78, 880–907.
- Schoonen, R., Hulstijn, J., & Bossers, B. (1998). Metacognitive and language-specific knowledge in native and foreign language reading comprehension: An empirical study among Dutch students in grades 6, 8 and 10. *Language learning*, 48(1), 71–106.
- Shanahan, T., Callison, K., Carriere, C., Duke, N. K., Pearson, P. D., Schatschneider, C., & Torgesen, J. (2010). *Improving reading*

- comprehension in kindergarten through 3rd grade: A practice guide* (NCEE 2010-4038). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from whatworks.ed.gov/publications/practiceguides
- Shanahan, T., & Beck, I. L. (2006). Effective literacy teaching for English-language learners. In D. August & T. Shanahan (Eds.), *Developing literacy in second-language learners: Report of the National Literacy Panel on language-minority children and youth* (pp. 415–488). Mahwah, NJ: Lawrence Erlbaum Associates.
- Shegar, C. (2009). Buddy Reading in a Singaporean Primary School Implications for Training and Research. *RELC Journal*, 40(2), 133–148.
- Shiotsu, T., & Weir, C. J. (2007). The relative significance of syntactic knowledge and vocabulary breadth in the prediction of reading comprehension test performance. *Language Testing*, 24, 99–128.
- Silver, R. E. (2008). *The impact of negotiation for meaning on reading comprehension among Singaporean primary students* (#OER 29/08 RS). Project funded by Office of Education Research, NIE.
- Snow, C. E., Barnes, W., Chandler, J., Goodman, I. F. & Hemphill, L. (1991). *Unfulfilled expectations: Home and school influences on literacy*. Cambridge, MA: Harvard University Press.
- Snow, C. E. (2004). What counts as literacy in early childhood? In K McCartney & D. Phillips (Eds.), *Handbook of early child development*. Oxford: Blackwell.
- Snowling, M. J. (2001). From language to reading and dyslexia. *Dyslexia*, 7(1), 37–46.
- Stæhr, L. S. (2008). Vocabulary size and the skills of listening, reading and writing. *The Language Learning Journal*, 36, 139–152.
- Stinson, M. & Freebody, K. (2005). Drama and oral communication. Project No. CRP 8/03 MS.
- Sun, B. (2010). *Morphological awareness in primary 3 bilingual Chinese children in Singapore* (Unpublished master's thesis). National Institute of Education, Singapore.
- Swanson, H. L. (1999). Reading comprehension and working memory in learning-disabled readers: Is the phonological loop more important than the executive system? *Journal of Experimental Child Psychology*, 72(1), 1–31.
- Swanson, L., Sa'ez, L., Gerber, M., & Leafstedt, J. (2004). Literacy and cognitive functioning in bilingual and nonbilingual children at or not at risk for reading disabilities. *Journal of Educational Psychology*, 96, 3–18.
- Tan, H. M. (2007). *Home and classroom influences on reading literacy of primary four students in Singapore: A secondary analysis on*

- PIRLS 2001 data* (Unpublished master's thesis). National Institute of Education, Singapore.
- Tan, Y. H. (2009). *What are the factors associated with reading accuracy and reading comprehension amongst Primary One girls?* (Unpublished master's thesis). National Institute of Education, Singapore.
- Tan, L. H., Spinks, J. A., Eden, G. F., Perfetti, C. A., Siok, W.T.. 2005. Reading depends on writing, in Chinese. *Proc. Natl. Acad. Sci. USA*, 102:8781–85.
- Tien, C. (2009) Conflict and accommodation in classroom codeswitching in Taiwan. *International Journal of Bilingual Education and Bilingualism*, 12(2), 173-192.
- Treiman, R. (Ed.). (1993). *Beginning to spell: A study of first-grade children*. New York: Oxford University Press.
- Vaish, V. (2008). *Biliteracy and Globalization: English Language Education in India*. Clevedon: Multilingual Matters.
- Vaish, V. (2012). Teacher beliefs regarding bilingualism in an English medium reading program. *International Journal of Bilingual Education and Bilingualism*, 15(1), 53–69.
- Vaish, V., & Subhan, A. (2014). 'Translanguaging' for comprehension in a reading class. *International Journal of Multilingualism*, DOI: 10.1080/14790718.2014.948447.
- Van Den Broek, P., & Kremer, K. E. (2000). The mind in action: What it means to comprehend during reading. In B. M. Taylor, M. F. Graves, & P. Van Den Broek (Eds.) *Reading for meaning: Fostering comprehension in the middle grades. Language and Literacy Series*, (pp. 1–31). New York: Teachers College Press.
- Van Gelderen, A., Schoonen, R., de Glopper, K., et al. (2004). Linguistic knowledge, processing speed, and metacognitive knowledge in first- and second-language reading comprehension: A componential analysis, *Journal of Educational Psychology* 96, 19–30.
- Vermeer, A. (2001). Coming to grips with lexical richness in spontaneous speech data. *Language Testing*, 17(1), 65–83.
- Wang, M., Park, Y., & Lee, K. R. (2006). Korean-English biliteracy acquisition: Cross-language phonological and orthographic transfer. *Journal of Educational Psychology*, 98, 148–158.
- Wimmer, H., Mayringer, H., & Landerl, K. (2000). The double-deficit hypothesis and difficulties in learning to read a regular orthography. *Journal of Educational Psychology*, 92, 668–680.
- Wolf, M., Bally, H., & Morris, R. (1986). Automaticity, retrieval processes, and reading: A longitudinal study in average and impaired readers. *Child Development*, 57, 988–1000.
- Wong, L. H. (2009-2011). *A mobile-assisted language learning environment to improve primary school pupils' attitudes and competencies in Chinese*

- proverb learning and writing*. Project No. OER 14/09 WLH. Project funded by Office of Education Research, NIE
- Wong, M. Y. (2005). *Metacognitive awareness and usage* (Unpublished master's thesis). National Institute of Education, Singapore.
- Yap, D. S. B. & Alsagoff, L. (2005). *Errors in tense and aspect in compositions of Secondary School students in Singapore*. Proceedings of the Redesigning Pedagogy: Research, Policy, Practice Conference.
- Zadeh, Z. Y., Farnia, F., & Geva, E. (2012). Toward modeling reading comprehension and reading fluency in English language learners. *Reading and Writing*, 25(1), 163–187.
- Zapata, M. E. (1994). The role of public libraries in literacy education. *Libri*, 44(2), 123–129.
- Zhang, L. (2009). *Enhancing Singaporean students' motivation, efficacy, engagement, and self-regulation for more effective bilingual/biliteracy learning* (#OER 25/08 LZ). Project funded by Office of Education Research, NIE.
- Zhang, D. (2011). *Morphology in biliteracy acquisition: An intervention study* (#OER 24/10 ZDB). Project funded by Office of Education Research, NIE.
- Zhang, D. (2012). Vocabulary and grammar knowledge in second language reading comprehension: a structural equation modeling study. *The Modern Language Journal*, 96, 558–575.
- Zhang, D. & Koda, K. (2011). Home literacy environment and word knowledge development: A study of young learners of Chinese as a heritage Language. *Bilingual Research Journal*, 34, 4–18.
- Zhang, D. & Koda, K. (in press). Awareness of derivation and compounding in Chinese-English biliteracy acquisition. *International Journal of Bilingual Education and Bilingualism*. DOI:10.1080/13670050.2012.736949.
- Zhang, D. & Li, L. (in press). Teaching of derivational morphology and Singaporean children's English word learning. In R. E. Silver & W. D. BokHorst-Heng (Eds.), *Quadrilingual education in Singapore: Pedagogical innovation in language education*. Dordrecht, Netherlands: Springer.
- Zhang, J., Anderson, R. C., Li, H., Dong, Q., Yu, X., & Zhang, Y. (2010). Cross-language transfer of insights into the structure of compound words. *Reading and Writing: An Interdisciplinary Journal*, 23, 311–336.
- Zhang, L. J., & Anual, S. B. (2008). The role of vocabulary in reading comprehension the case of secondary school students learning English in Singapore. *RELC Journal*, 39, 51–76.
- Zhao, S. H. & Shang, G. W. (2013). *Linguistic landscape in Singapore schools: An empirical revelation*. Paper presented at the SISU (Shanghai International Studies University) International Symposium of 2013 Language Policy and Education. Shanghai, China.

A publication of the
Office of Education Research,
NIE/NTU, Singapore © 2014

ISBN 978-981-09-3467-5



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