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Exploring emergent literacy development in a second language: A selective literatu rereview and conceptual framework for research

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Abstract
While there have been reviews over the past decade of studies examining second-language (L2) acquisition and also emergent literacy development, these related bodies of knowledge have not generally been considered together in relation to the education of very young English-language learners. This paper attempts to do so in a selective manner by proposing a preliminary conceptual framework for second language emergent literacy development, thus paving the way for future research. The literature on the emergent literacy of native English speakers is first outlined, followed by a discussion of the general effects of bilingualism and cross-linguistic transfer, with the special case of Hong Kong children serving as an illustrative example. Finally, potential environmental influences are explored, with a focus on the home literacy environment.

Keywords
emergent literacy, early literacy development, English as an additional language, bilingual children, bilingualism

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Introduction

While there have been a number of reviews in the last decade of studies examining second-language (L2) reading acquisition (August and Shanahan, 2006; Eskey, 2005; Grabe, 2010) as well as emergent literacy development (Lonigan, 2006; Whitehurst and Lonigan, 1998, 2003), when the discussion turns to the education of very young English-language learners (ELLs), these related bodies of knowledge have not generally been considered together. This paper attempts to do so in a selective manner, by proposing a preliminary conceptual framework for L2 emergent literacy development.

The review of research begins with a brief overview of the emergent literacy development of English native (L1) speakers, examining the respective contributions of code-related and oral language skills to later reading ability. This is followed by a discussion of the general effects of bilingualism and cross-linguistic transfer, and the special case of Hong Kong Chinese–English bilinguals and ELLs is examined for illustrative purposes. Finally, potential environmental influences are explored, with a focus on the role of the home literacy environment (HLE). This is not a systematic literature review, and it is acknowledged that this vast literature could be tackled using alternative approaches, but the decision to ground this review within the emergent literacy framework was mainly due to its particular orientation towards applied educational issues at a level that may be useful to practitioners, especially in terms of the early identification of and intervention in English reading difficulties.

Furthermore, the authors take as their point of departure the structural equation model (SEM) constructed by Storch and Whitehurst (2002) for L1 emergent literacy development, which is based on the two-domain emergent literacy model proposed by Whitehurst and Lonigan (1998). It is argued that this L1 model has all the hallmarks of a 'good model', and its empirical strength is clear. An attempt was therefore made to create a similar model for L2 children, which might prompt researchers to adopt a more comprehensive view of the developmental process as well as a more methodologically rigorous approach. Figure 1 provides a graphical representation of the proposed conceptual framework, which is presented like a SEM, similar to the one constructed by Storch and Whitehurst (2002). Hence, the circles represent latent constructs (i.e. unobserved variables) and the rectangles represent manifest indicators (i.e. measured variables). The direction arrows indicate hypothesized relationships between variables, and those connecting latent constructs signify causal relationships only in the theoretical sense. As the

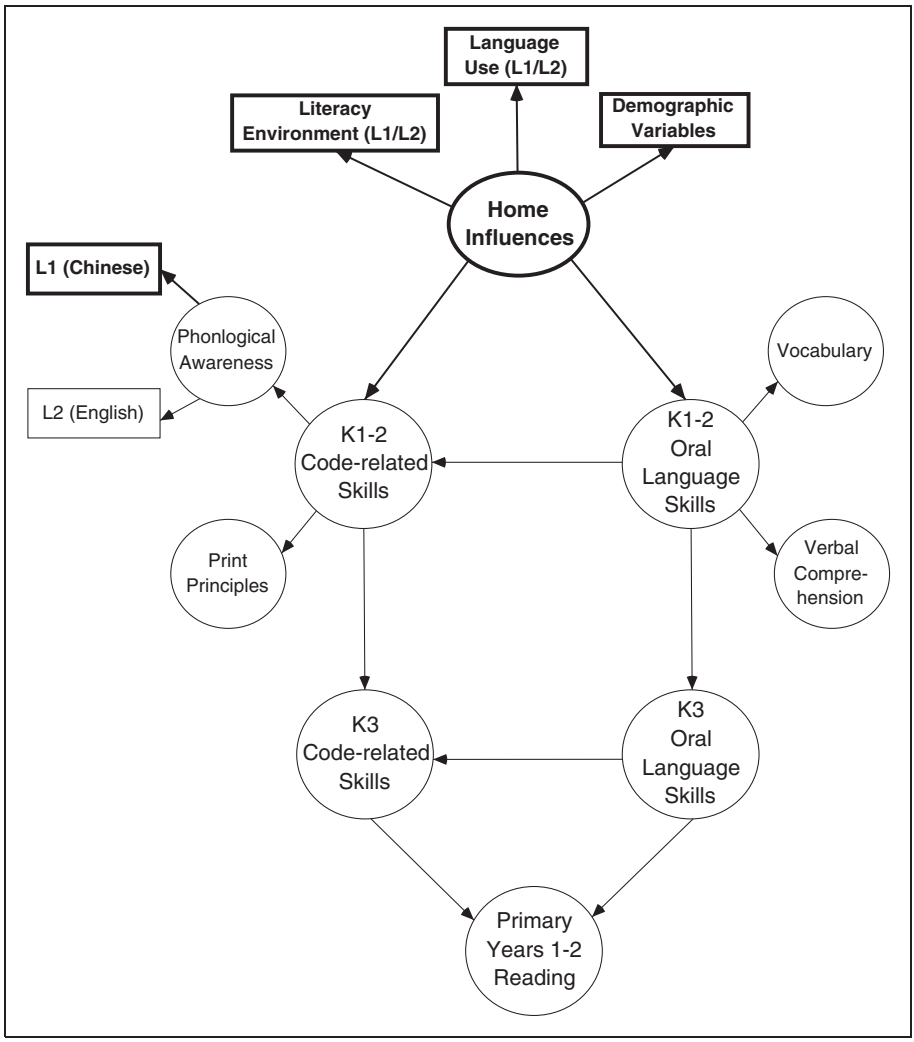

Figure 1. A conceptual model of L2 emergent literacy development for Hong Kong children. Note that K1, K2 and K3 signify the first, second and third (final) years of kindergarten, respectively.

aim is not to specify a complete model for SEM analysis (i.e. not all manifest indicators are shown), the figure simply maps out, in temporal order, the key constructs and predictive pathways between emergent literacy skills in kindergarten and word-reading ability in early primary (based on the L1 model), while taking into account the additional linguistic and environmental influences (highlighted in bold) of L2 children. Also, the direction of influence is

modelled as flowing from oral language skills to code-related skills, on the basis that early L2 instruction tends to begin with more general language exposure before introducing letters and sounds.

Furthermore, in line with the tradition of second-language acquisition (SLA) rather than bilingualism or biliteracy research, this conceptual framework orients strongly towards L2 development, so the role of the mother tongue is considered insofar as it may affect children's early SLA. Since it is difficult to generalize across very varied L2/bilingual populations, the case of Hong Kong children is used as an example, so Figure 1 reflects the unique effects of cross-linguistic transfer from Chinese (L1) to English (L2), and the educational context in which SLA takes place. Hong Kong children are typically exposed to some L2 instruction at age 3, when they begin a three-year non-compulsory kindergarten programme (K1–K3). Although the government has not actively encouraged L2 learning at the pre-primary level (Curriculum Development Council, 2006), there is huge market demand and over 97% of kindergartens provide some form of English instruction, mostly using traditional teaching methods (e.g. textbooks, writing, drill etc.) (Education and Manpower Bureau, 2003). English and Chinese also contrast very sharply in their written and spoken forms, so it serves as a theoretically interesting 'test case' for extending the L1 emergent literacy model. Hypothetically, if one were to focus on another L2 population, the same basic theoretical constructs and developmental pathways would apply, with only relatively minor modifications needing to be made to reflect unique cross-linguistic and environmental influences.

Emergent literacy: An overview

First coined by Teale and Sulzby in 1986 to mark a paradigm shift in the view of how children become literate, the term *emergent literacy* is defined by Whitehurst and Lonigan (1998) as those skills, knowledge and attitudes that are presumed to be developmental precursors to reading and writing, as well as the environments that support those developments (e.g. shared book reading). This implies that the acquisition of literacy is conceptualised as a developmental continuum with its origins early in the life of a child, departing from the traditional perspective of maturational and readiness views, suggesting that there is no clear demarcation between reading and pre-reading (Whitehurst and Lonigan, 2003). It recognizes literacy-related behaviours in pre-school as legitimate and important aspects of development and posits that significant sources of individual differences in children's later reading skills

are already present in early childhood (Lonigan et al., 2000). While the construct of emergent literacy can be examined using other classification systems (e.g. Mason and Stewart, 1990), Whitehurst and Lonigan's (1998) definition seems to have gained greater recognition in recent years, possibly because of its simpler two-domain structure of interdependent skills: *code-related skills* and *oral language skills* (Storch and Whitehurst, 2002). Code-related skills include the conventions of print, beginning forms of writing, knowledge of graphemes, grapheme–phoneme correspondences and phonological awareness, whereas oral language skills include semantic, syntactic and conceptual knowledge as well as narrative discourse (Storch and Whitehurst, 2002). In other words, code-related skills represent children's knowledge of the rules for translating writing into meaningful sounds, and oral language skills reflect more general ability and knowledge that support comprehension.

To understand the respective roles of these precursor skills in eventual literacy, numerous predictive studies have been conducted on various samples of young children (Bradley and Bryant, 1985; Bryant et al., 1990; Burgess and Lonigan, 1998; Chaney, 1992; Goswami, 2003; Lonigan, 2006; Wagner and Torgesen, 1987; Wagner et al., 1993, 1994, 1997, 2006; Williams, 2004), and the results are reassuringly similar. The collective findings seem to indicate that three key component skills are strongly predictive of how well and how easily children will learn to read and write once they are exposed to formal reading instruction: *oral language*, *phonological-processing abilities* and *print knowledge*. Some of these common findings have been highlighted by comprehensive meta-analyses, such as those conducted by Scarborough (2003) and the U.S. National Early Literacy Panel (NELP, 2005). As expected, early measures of actual reading (i.e. decoding words and non-words) were found to be the best predictors of later reading, while performance on non-verbal tasks (e.g. visual and motor skills) actually provided little prognostic information about future reading difficulties. In terms of component skills, measures of alphabet knowledge and phonological awareness have sizable relations with decoding skills, and concepts of print, name writing and invented spelling measures have moderate to strong relations. As for early measures of oral language, the results suggest that some aspects (e.g. listening comprehension) are stronger predictors of later reading than others (e.g. expressive or receptive vocabulary), but the average correlations are generally weaker than those for code-related skills (NELP, 2005). Finally, the predictability of future reading ability seems to be about as strong from kindergarten onwards as it is from grade to grade once formal reading instruction has begun (Scarborough, 2003). In short, it seems that the key cognitive–linguistic strands that must be

coordinated when learning to read are quite firmly in place before primary school. Thus, children who arrive at school with weaker verbal ability and literacy knowledge are much more likely than their peers to experience reading difficulties.

However, the literature remains contentious, e.g. whether or not phonological awareness is causally linked to reading (Castles and Coltheart, 2004) and the predictive power of large versus small phonological units (Hulme et al., 2002). Specifically, from an applied education point of view, one of the greatest complications is recognition of the significant and longitudinal correlations between oral language abilities (e.g. vocabulary) and phonological skills (Burgess and Lonigan, 1998; Chaney, 1992; Lonigan et al., 1998; Wagner et al., 1993, 1997). Some find little support for the effects of oral language on reading beyond the influence of phonological skills (Bryant et al., 1990; Roth et al., 1996; Speece et al., 1999; Vellutino et al., 1996) or for that relationship being driven by general intelligence. However, others warn that the role of phonological abilities has been overemphasized (Bishop, 1991; Nation and Snowling, 2004) and claim that phonological awareness is necessary but not sufficient for the acquisition of decoding ability (Catts et al., 1999; Fielding-Barnsley et al., 2005). This lack of consensus is partly due to a diverse body of research, as each study focuses on a slightly different set of emergent literacy skills and outcome measures, which are assessed using different instruments with the resulting data being modelled in various ways.

In order to seek clarification of the conflicting evidence, a growing number of researchers have sought to examine the relationships longitudinally using a multivariate approach (Kirby et al., 2008; Konold et al., 2003; Landerl and Wimmer, 2008; Senechal and LeFevre, 2002; Storch and Whitehurst, 2001, 2002; Vellutino and Scanlon, 2003; Vellutino et al., 2007; Whitehurst and Lonigan, 1998). For example, Lonigan and coworkers (2000) studied the relations between phonological awareness, letter knowledge, oral language and decoding skills in two samples of pre-school children who were followed longitudinally (96 children from early to late pre-school and 97 children from late pre-school to kindergarten or first grade). Using SEM, they found significant developmental continuity of these skills, but only phonological awareness and letter knowledge contributed unique variance (54%) to the prediction of decoding (Lonigan et al., 2000). Likewise, Senechal and LeFevre (2002) also fail to show an independent relation between oral language and reading in first and second grades. In a more comprehensive study, Storch and Whitehurst (2002) followed 626 Head Start children from pre-school through to fourth grade. Interestingly, again using SEM, they reported that

kindergarten oral language skills do have a significant *indirect* effect of .24 (standardized form) on grade 1 reading achievement, and that the relationship is mediated by kindergarten code-related skills, such as phonological processing and print concepts (Lonigan, 2006; Storch and Whitehurst, 2002). Although there may be disagreements over statistical modelling techniques (e.g. see National Institute of Child Health and Human Development [NICHD] Early Child Care Research Network, 2005; Bracken, 2005), there does seem to be a growing consensus that the role of oral language in the early stages of acquisition has been unduly overlooked.

The effect of bilingualism on language and literacy development

Although intuitively plausible, the extent to which established concepts and models of L1 emergent literacy could extend to an L2/bilingual population is largely unknown. In its synthesis of relevant literature, the U.S. National Literacy Panel on Language-Minority Children and Youth argued that it was still difficult to draw strong conclusions about the nature of precursor skills that predict later literacy development in language-minority students (August and Shanahan, 2006). While the findings were generally consistent with monolingual English-speaking children, it is clear that L2 children are subject to an additional set of intervening influences, most notably those relating to their L1 proficiency.

Before examining cross-linguistic transfer from L1 to L2, which is particularly prominent in phonological development (Paradis, 2007b), it is worth considering the effects of bilingualism more generally, i.e. do children's *experience* of learning two languages sequentially influence the way they acquire L2 literacy? Note that the theoretical distinction between bilingualism and SLA is deliberately blurred here, as the discussion draws upon both fields simultaneously, and some authors treat SLA as a subtype of bilingual acquisition (Butler and Hakuta, 2004; Ritchie and Bhatia, 2008). Thus, unless otherwise stated, 'bilinguals' can also refer to L2 learners.

Broadly defined, *bilingualism* refers to knowledge and command of two or more languages, albeit to different degrees (Montrul, 2008). Across a wide range of studies investigating a variety of abilities, it is clear that bilingualism is an experience that has significant consequences for cognitive performance (Bialystok, 2006, 2009). The nature and direction of those consequences, however, are less clear, as research has often produced mixed results (Grosjean, 1998), perhaps due in part to the diversity of the population in

question (Bialystok, 2001; Finnegan-Catibusic, 2006; Murphy and Pine, 2003). Children become bilingual for various reasons, and their circumstances are often confounded with social and demographic factors that may themselves influence children's level of cognitive achievement (Bialystok, 2004). This results in a multitude of permutations, all of which could produce different outcomes.

Bialystok seeks clarity by positing that L1 and L2 literacy acquisition is essentially related via three key precursors: (a) oral competence in the literary forms of language, (b) conceptual development that includes understanding the symbolic notational systems of print and (c) metalinguistic insights that allow children to achieve awareness of the phonological forms of language (Bialystok, 2007). Each of these background skills has been shown to be influenced by bilingualism, but in very different ways. First, bilingual children may have relatively little spoken L2 knowledge when reading instruction begins (Koda, 2005; Masuhara, 2007), so their L2 reading development is likely to be hampered by inadequate linguistic control (Grabe, 2010; Koda, 2007; Rickard Liow, 1999). However, such a delay may be brief and easily overcome, as it is possible that L2 learners accumulate vocabulary more rapidly the second time round, being more cognitively mature when the process starts and having an existing L1 lexicon to draw upon for insights into conceptual-lexical mappings (Paradis, 2007a). Second, in terms of symbolic concepts of print, these units are different across languages, so bilingual children must acquire appropriate representations for each language they are learning to read. Even for different languages written in the same system (e.g. two alphabetic languages), children may discover these essential relations with different ease because of differences in orthographic transparency (Goswami, 1999). Bialystok and coworkers found that bilingualism does not lead to any disadvantages in children's efforts to establish the concepts of print needed for learning to read; rather it may enhance the extraction of these concepts in most cases (Bialystok, 1997; Bialystok et al., 2000). Third, for bilingual children acquiring two languages that foster different levels of phonological awareness, they may benefit by transferring their metalinguistic understanding of one language to another, thereby boosting their literacy development (Bialystok, 2007; Durgunoglu et al., 1993; Rickard Liow and Poon, 1998). However, such bilingual advantages among kindergarten children may be short-lived, as the effects have usually disappeared by first grade (Bruck and Genesee, 1995; Yelland et al., 1993), perhaps due to the introduction of formal reading instruction, erasing group differences and instilling the same levels of sensitivity in all readers irrespective of their competence in

spoken language (Bialystok, 2004). Furthermore, the appearance of bilingual advantages is sometimes also dependent on the phonological unitis assessed (syllable, rime, phoneme) and the cognitive demands imposed (Bialystok et al., 2003), as well as the language pairs in the bilingual mix (i.e. the phonological relation between them).

In light of the above, it seems that the effects of bilingualism must ultimately be examined with a specific target population in mind (Oller and Jarmulowicz, 2007). More detailed analyses of the properties of languages and writing systems are needed in order to determine the relative weight that each background factor exerts. Before considering the special case of Chinese–English bilinguals and ELLs in Hong Kong, a very brief overview of the complex topic of cross-linguistic transfer is presented.

Cross-linguistic transfer: An overview

Cross-linguistic transfer (or cross-linguistic influence) has long been a major theoretical concept in applied linguistics, SLA and language teaching research, but remains a contested concept (Butler and Hakuta, 2004; Koda, 2005; Odlin, 1989, 2010).

> Transfer is the influence resulting from the similarities and differences between the target language and any other language that has been previously (and perhaps imperfectly) acquired. (Odlin, 1989: 26)

The above working definition from Odlin (1989) implies that both positive (i.e. facilitation) and negative (i.e. interference) effects may arise, and the source of these impacts is the similarities and differences between language systems (Arabski, 2006; Figueredo, 2006; Genesee and Geva, 2006; Genesee et al., 2006; Geva and Genesee, 2006; Koda, 2005, 2007; Oller and Jarmulowicz, 2007; Skehan, 2008). This is usually refered to as *typological distance*, which relates to levels of phonological processing and orthographic depth (i.e. the difference in the degree to which sound-to-spelling correspondences are regular and may be accurately mapped) (Koda, 2005). If two languages are typologically close, as in the case of Spanish- or German-speaking children learning to read English, one would expect that familiarity with the Roman alphabet would contribute to the acquisition of reading and spelling in English in the TL. However, due to marked typological differences, Chinese-speaking ELLs may have greater difficulty with the English alphabet (August and Shanahan, 2006; Riches and Genesee, 2006; Wang and Geva, 2003a), and vice versa.

In recent years, the phenomenon of language transfer has generally been viewed not as a mechanical transference of L1 structures but as a cognitive mechanism that underlies L2 acquisition (Gass, 1996; Gass and Selinker, 2008). The focus has been on the domain specificity of transfer between languages (i.e. the concrete sharing of linguistic skills) (Oller and Jarmulowicz, 2007), although more abstract interdependence effects on verbal cognition (i.e. metalinguistic) have not been ruled out. Various aspects of L1 capability have been shown to be transferred during L2 production and interpretation (e.g. morphosyntax, phonology, pragmatics, communicative strategies etc.) (Koda, 2005; Ortega, 2009); however, most studies have focused on the domain of phonological awareness, as influence of the L1 is highly apparent in L2 phonology (Bialystok et al., 2005a; Geva and Genesee, 2006; Geva and Wang, 2001; Koda, 2007; Skehan, 2008). Unsurprisingly, the patterns observed tend to be positive for alphabetic languages (Bruck and Genesee, 1995; Campbell and Sais, 1995; D'Angiulli et al., 2001; Durgunoglu et al., 1993; Kahn-Horwitz et al., 2005; Lindsey et al., 2003; Marian and Kaushanskaya, 2007; Oller and Jarmulowicz, 2007; Quiroga et al., 2002; Riches and Genesee, 2006; Saiegh-Haddad and Geva, 2008; Verhoeven, 2007;), although some disagree (Carlisle and Beeman, 2000).

A growing number of cross-linguistic studies have also examined typologically different language pairs: if one language has an alphabet and the other an ideographic system, it is not certain whether a similar pattern of cross-linguistic relationship exists. Some argue that there is little or no transfer at all (Bialystok et al., 2003, 2005b; Oller and Jarmulowicz, 2007), while others claim that a certain level of phonological transfer does occur, even across two very different writing systems (Gottardo et al., 2001; Wang et al., 2005).

The special case of Chinese–English bilinguals and ELLs in Hong Kong

Although phonological processing may be universal across languages, the level of processing may be constrained by the nature of the writing system (Perfetti et al., 1992). Looking specifically at Chinese and English, it is clear that they contrast sharply in their writing systems as well as in their spoken forms. The English alphabetic writing system is phonemically based, whereas the Chinese writing system is better characterized as morphosyllabic, with each Chinese character representing both a morpheme and a syllable (McBride-Chang et al., 2004; Perfetti and Zhang, 1995). It has been estimated that roughly 6,000

characters are required for scholarly literacy and 3,500 are designated as 'modern Chinese characters for everyday use' (Wu et al., 1999). During six years of primary education, Chinese children are required to learn around 3,000 characters through formal instruction. Hence, Chinese literacy demands a massive number of symbols which, although visually far more complex than alphabetic letters, contain recurring internal elements (Bialystok, 2007; Koda, 2005).

Characters are formed from radicals, i.e. functionally identifiable recurrent stroke patterns (Chan et al., 2008; Feldman and Siok, 1999; McBride-Chang, 2004). Many radicals are single-unit characters in themselves and are used both as independent words and as components in other characters (e.g. *fire* 火, *woman* 女). Some radicals, however, lack lexical status and serve only as character components (e.g. 宀, 阝). Although there are several character-formation methods, semantic-phonetic compounding is by far the most dominant, so most multiple-unit characters contain a phonetic radical and a semantic radical (e.g. *stove* 爐, *aunt* 姨), which give an approximate guide to pronunciation and meaning, respectively. Children therefore become sensitive to the rule-based structure of semantic and phonological radicals that comprise characters (Chan and Nunes, 1998), even if they are not explicitly taught. Note, however, a phonetic radical does not always prove to be a reliable pronunciation guide, and many characters do not have exactly the same pronunciation as their phonetic symbol suggests (Koda, 2005). Indeed, estimates of phonological consistency only range from 37% to 39% (Perfetti et al., 1992; Zhou, 1978).

Ho and Bryant examined the development of the phonological awareness of Chinese children and its relationship with their success in L1 reading. They found that Chinese children, like English-speaking children, are able to detect relatively large sound segments (e.g. partial homophones) when they begin to acquire reading skills and that they gradually develop the ability to manipulate smaller units (e.g. rhymes and tones) (Ho and Bryant, 1997b). However, cross-linguistic comparisons indicate that Chinese children develop an awareness of initial consonants and rhymes later than their English-speaking counterparts. In other words, the differences in the oral and written language features of Chinese and English influence children's rate of phonological awareness development differentially.

English and Chinese also differ in that the latter is a tonal language, and Cantonese, in particular, includes a large number of tonal distinctions. Two characters with the same phonemic composition can support different meanings: in Cantonese, for example, 媽maa(1) means 'mother' and 馬maa(5)

means 'horse', the number indicating the level and contour of tones. The ability to discriminate tones is deemed to be similar to phonological awareness but based on different attentional procedures (Luk and Bialystok, 2008). Findings from various studies underscore the unique importance of both tone and syllable for early Chinese character acquisition (Chow et al., 2005; McBride-Chang, 2004; McBride-Chang and Ho, 2000; McBride-Chang and Kail, 2002; McBride-Chang et al., 2004, 2008; Shu et al., 2008). Therefore, learning to read Chinese script does not generally provide any explicit experience of individual phonemes (McDowell and Lorch, 2008), although teaching strategies do vary from one region to another, depending on whether Mandarin or Cantonese is spoken. In Mainland China and Taiwan, children learn to read Chinese (i.e. Mandarin) with assistance from a separate phonetic system (e.g. Pinyin) in the first few weeks of first grade. In Hong Kong, however, children are taught using a whole character approach and rote learning strategies (Ho and Bryant, 1997a). New characters are learned by copying and holistic memorization, whereby the teacher reads a new character aloud and explains its meaning. Unsurprisingly, therefore, Chinese children who are experienced in using a phonetic system tend to be more successful in manipulating speech sounds than those who are literate only in Chinese characters, and such effects may have an impact on their acquisition of an alphabetic L2 (Wang and Geva, 2003b).

Despite the recognition of the relevance of phonological awareness in Chinese, Chinese ELLs' L1 phonological sensitivity does not necessarily aid their L2 acquisition. Hong Kong university students were found to have difficulty with a pseudoword spelling task, as they lacked phonological awareness skills at subsyllabic levels to transfer to English, and thus were limited to a whole-word visual strategy (Holm and Dodd, 1996). Similar findings were reported in Canadian studies (Wang and Geva, 2003a, 2003b), which suggests that the English spelling errors of Chinese children reflected difficulty in representing phonemes that are absent in their Cantonese phonology, although this negative transfer did not persist across time. Likewise, Rickard Liow and Poon (1998) argue that while Chinese ELLs have good tonal phonological awareness, their weak alphabetic phonological awareness skills results in poor performance on English pseudoword spelling.

The relative reliance of adult Chinese ELLs on phonological and orthographic processing in English word identification has also been examined in relation to Korean ELLs, who have an alphabetic L1 literacy background (Wang et al., 2003). The authors reported that Chinese ELLs seem to rely less on phonological information and more on orthographic information to

identify English words than their Korean counterparts. They cite further evidence that their Chinese subjects performed worse than their Korean counterparts on a phoneme deletion task and made more errors that were phonologically incorrect but orthographically acceptable. They therefore suggest that cross-writing system differences in L1s (i.e. reading in Hangul relies heavily on phonological information while Chinese draws upon detailed visual orthography) and L1 reading skills transfer could be responsible for these L2 performance differences (Wang et al., 2003). This conclusion, however, was criticized by Yamada (2004) as premature. He calls it 'an L1-script-transfer-effect fallacy', and proposes instead that the L1 phonological system (rather than the L1 writing system) of the learner largely accounts for cognitive processes in learning to read an L2 (Yamada, 2004). Wang et al. (2004) subsequently replied that both language and writing systems are important, and it is almost impossible to partition transfer effects neatly across the two factors. So while they agree with Yamada that the linguistic properties of L2 and their similarity to L1 are critical, they believe that writing systems still have an effect (Wang et al., 2004).

Interestingly, this suggestion of a negative impact of Chinese orthographic skills on L2 English reading has been corroborated by more recent research on Hong Kong elementary schoolchildren (Keung and Ho, 2009). The authors hypothesize that,

> the visual-spatial skills acquired in recognizing Chinese characters may not facilitate memory of letter sequences. In addition, the part-whole derived phonology encourages character decoding at the syllabic level in Chinese, whereas the assembled phonology requires word decoding at the phonemic level in English. Therefore, applying the orthographic tactics in Chinese to learning English words would be counter-productive. (p. 110)

It is difficult to conclude definitively, however, whether such examples of poor L2 English reading are indeed caused by L1 negative transfer (at the orthographic or phonological level). Perhaps the overriding influence is not the Chinese writing system, but rather the ineffective logographic 'look and say' teaching method employed in *some* schools, which draws little attention to individual letter sounds or names and emphasizes words' holistic visual configuration (McBride-Chang and Treiman, 2003). It is as if the exact same pedagogic technique is applied to both Chinese and English learning. Even in secondary school, most teachers appear to favour a didactic, transmissional style of teaching, so students are rarely given the opportunity to speak in

English lessons, as class time is largely devoted to individual work on textbook exercises (Evans, 1997). Hence, L2 learning in the Hong Kong context tends to place much greater emphasis on developing reading and writing skills than on attaining spoken fluency.

Much of the empirical research on young Hong Kong L2 learners has been conducted in the field of psycholinguistics, most notably by McBride-Chang and coworkers (2002, 2003, 2004, 2005, 2006, 2008), and their pioneering work has produced some interesting (yet provocative) findings. McBride-Chang and Kail (2002) examined the extent to which four cognitive processes (i.e. phonological awareness in syllable manipulation, speed naming, visual processing and speed of processing) predicted English word recognition skills in Hong Kong ($n = 190$ kindergarten) and American ($n = 128$ kindergarten and grade 1) children. They found that the predictive models were remarkably similar across both groups (i.e. the strongest predictor was syllable awareness while visual processing appeared to be unrelated), and that Chinese children were more accurate than their American counterparts on the English syllable deletion task. They concluded that bilingualism had facilitated the children's early metalinguistic ability to manipulate speech sounds in a second language (McBride-Chang and Kail, 2002).

The predictive power of syllable awareness versus phoneme onset awareness in relation to English reading was later examined in a mixed sample of children from Xian (China), Hong Kong and Toronto (McBride-Chang et al., 2004). Looking specifically at the results for the 70 Hong Kong children, there was a surprising lack of association between the two phonological measures. Indeed, phoneme awareness was not a significant predictor of English word recognition, but syllable awareness was. One striking factor contributing to this unusual finding, as acknowledged by the authors themselves, was the restriction in the range of scores on the phoneme onset task for this particular subgroup (i.e. both kindergarten and grade 1 children in Hong Kong scored at floor level).

McBride-Chang and Ho (2005) subsequently conducted two longitudinal predictive studies on Hong Kong kindergarten children's Chinese and English reading abilities: one was a two-year study involving 90 four-year-olds, and the other a nine-month study of 203 five-year-olds (Chow et al., 2005). They again reported that syllable deletion is a relatively strong predictor of reading in both scripts (concurrently and longitudinally), and that English phonological processing skills do not account for the unique variance in either language. It is speculated that young children's native phonological-processing skills tend to be better associated with reading skills in any script, or that the

result is specific to very young learners or even to the nature of the two orthographies (McBride-Chang and Ho, 2005).

In interpreting the above studies, it is important to note that the selected measures of English phonological processing only included syllable deletion, verbal memory and speed naming tasks. It is somewhat unsurprising that parallel phonological measures conducted in Cantonese were more powerful (and perhaps more valid) predictors than their L2 equivalents, especially for children with very limited English proficiency. The fact that English phonological processing was considered without phonemic awareness, which is arguably its most distinctive feature, is puzzling. Although awareness of phonemes is more difficult in Chinese and teachers may not explicitly draw children's attention to letter sounds when teaching English, it is hard to imagine that phonemic awareness plays no major role in early L2 acquisition. Therefore, it may be premature to conclude that L1 phonological skills are better than L2 phonological skills in predicting L2 reading development.

Reassuringly, it was found in another study conducted on a similar population (i.e. 217 Hong Kong kindergarten children) that phoneme onset awareness but not syllable awareness is uniquely predictive of English vocabulary knowledge, which in turn is significantly related to English word-reading ability ($r = .43$; $p < .001$) (McBride-Chang et al., 2006). Similarly, a more recent publication presents both syllable awareness and syllable onset awareness (treated as a phonemic measure) as unique predictors of English word recognition for Hong Kong children ($N = 211$, mean age = 4;5) but still assigns greater importance to the former psycholinguistic unit (McBride-Chang et al., 2008):

> The syllable is the simplest unit of phonological awareness. . .Thus, for beginning readers, awareness of the syllable may help in mapping oral to written language across orthographies, including both Chinese and English. . .Because English is a relatively unreliable alphabetic orthography in which larger sized units must sometimes be learned in addition to (smaller) phoneme units, syllable awareness may be important for early acquisition of English word recognition. . .Therefore, it is not surprising that syllable awareness should have been strongly associated with early reading of both English and Chinese among young Chinese children, presumably sensitized to the syllable unit through the L1 . . . . (McBride-Chang et al., 2008: 187)

It is argued that these results underscore both the universality of L1 phonological transfer to L2 reading and the importance of different psycholinguistic

units for understanding reading acquisition (McBride-Chang et al., 2008). However, this study suffers from severe floor effects on the syllable onset deletion task, as 83% of the sample scored 0, while the remaining 17% scored 1 or above. The poor performance of the children was again attributed to the lack of phonics instruction in kindergarten, but upon closer inspection of the task itself, it is somewhat unsurprising that so many struggled with it. Even if it was administered to older learners, it may still have proven to be quite a challenge. Although it was intended to be a measure of *phonemic* awareness, a psycholinguistic unit that has been established as less relevant to Chinese script, this task was administered in Cantonese. It required children to produce orally a single-syllable Chinese word without an initial sound or consonant (i.e. /caa1/ would become /aa1/), and the items consisted of both real and nonsense words. A more sensitive (and perhaps more conceptually valid) measure might be an equivalent task of phoneme deletion administered in English (e.g. *cage* to *age*), which may still be too difficult for these L2 children but would likely be more intuitive to the average Chinese person. Such methodological limitations are often unavoidable in research, but they may explain the seemingly conflicting results.

Other studies on Chinese–English bilinguals have also looked at the possible transfer of vocabulary and decoding skills (measured using word identification tasks) across the two languages. As expected, a different pattern exists and most agree that there is minimal transfer, if any (Bialystok et al., 2005a, 2005b; Wang et al., 2005). Gottardo et al. (2001) compared the word recognition performance of 65 Cantonese-English-speaking children in Canada (mean age = 9;0), some of whom were recent immigrants whereas others had been born in the country. The authors reported that word-recognition measures did not correlate across the two languages. Likewise, Luk and Bialystok (2008) also examined the early reading ability of 57 Cantonese–English bilingual six-year-olds who were born in Canada, though their parents or grandparents were immigrants from Hong Kong. The children completed cognitive measures, phonological awareness tasks and word identification tests in both languages. Once cognitive abilities had been controlled, there was no correlation in word identification ability performance across languages, but the correspondence in phonological awareness measures remained strong (Luk and Bialystok, 2008). The results, therefore, indicate that unlike phonological awareness, which depends on a set of cognitive abilities that is applied generally across languages, word-recognition skills need to be built up separately for each language or each writing system. Establishing a skill in one language or system does not guarantee that it will be available in another, at least in two

writing systems as diverse as Chinese and English (Bialystok et al., 2005b; McBride-Chang et al., 2006). This obviously sets clear limits on the transferability of these skills for reading. In short, it seems that no matter how much transfer of high-order reading ability crosses over a child's languages, language-specific skills are still necessary (Bialystok, 2004).

Before concluding this discussion, it is important to note that despite current evidence for cross-linguistic transfer and its strong appeal, it remains a contested concept in language learning. Many investigations have generally assumed that identifying transfer is quite transparent, given a basic phonological description of the language (Major, 2008), but they do not systematically rule out alternative explanations (Skehan, 2008; Snow, 2006). One major concern is a methodological one, as simple correlational analyses between L1 and L2 measures do not allow for causal relations to be identified (Genesee et al., 2006). In order to demonstrate that there is transfer from L1 to L2, for example, meditational analyses would be necessary, i.e. L1 emergent literacy skills should be shown to precede L2 emergent literacy skills in time, which in turn precede L2 reading. Snow (2006) suggests that unequivocal proof of transfer might come from intervention studies, whereby some specific L1 skill is taught to one group of learners and their subsequent L2 performance on a related skill is compared with a control group. Alternatively, others have argued that the prevailing metaphor of transfer of skills is misleading, and that what actually happens is access to an already existing general cognitive skill (Geva and Ryan, 1993; Walter, 2008), which is largely independent of specific language experience or other experiential factors. Nevertheless, on the basis of the currently available evidence, the possibility of phonological transfer from Chinese to English cannot be ruled out.

Sources of individual differences: Home Literacy Environment

Learners vary enormously in how successful they are at learning a language (Ellis, 2004). L2 learners, in particular, may have more potential sources of individual differences than their L1 peers (Ellis, 2004; Herschensohn, 2007; Paradis, 2007a). Research has examined various factors ranging from learner psychological and cognitive characteristics to external variables such as the social context of target language input (Butler and Hakuta, 2004; Ellis, 2004; Phillips and Lonigan, 2005; Segalowitz, 1997). For young L2 children, a primary external influence is instruction – both formal instruction and the incidental instruction associated with language and literacy-rich environments. Yet, there are often still striking individual differences in the rates of

child L2 acquisition, even for children with similar amounts of classroom exposure to the L2 and similar instructional programmes (Paradis, 2007b). Thus, home influences may deserve greater research attention – both in terms of the input frequency of the L2 (Cobo-Lewis et al., 2002; Gathercole and Thomas, 2005; Jia, 2003; Jia and Aaronson, 2003) and the quality of the input (Golberg et al., 2008). Perhaps the rich vocabulary that parents provide when they use their L1 could also have a positive impact on L2 lexical growth, through a positive impact on L1 lexical growth (Goldenberg et al., 2006; Paradis, 2007b).

Although very few L2 or bilingualism studies have considered the effects of the Home Literacy Environment (HLE) in depth, there is a rich L1 literature to draw upon. The importance of the HLE has been recognized for many years, anchored in the notion that the home is generally the setting in which a child first encounters language and literacy, and one that provides opportunities to observe, explore and participate in literacy activities (Bracken and Fischel, 2008). Children's first experiences with books, stories and songs commonly occur at home with family members and other caregivers (McBride-Chang, 2004). Research consistently demonstrates strong relations between parents' interactive strategies, particularly the quality of their language input and shared book reading, and children's vocabulary and general language development (Bus, 2003; Frijters et al., 2000; Hoff, 2006; Landry and Smith, 2006; Levy et al., 2006; Sammons et al., 2002, 2005; Senechal et al., 1996, 2001, 2006; Umek et al., 2005; Whitehurst and Lonigan, 1998; Zill and Resnick, 2006), even for disadvantaged children from low-income families (Britto and Brooks-Gunn, 2001; Britto, 2001; Britto et al., 2006; Christian et al., 1998; Lynch, 2008; Raikes et al., 2006).

Storch and Whitehurst (2001) followed 367 Head Start children from preschool through to second grade and constructed an SEM to evaluate the influence of the HLE on children's later reading achievement. They found that the three factors constituting the home and family characteristics (literacy environment, parental expectations of children's school success and parental characteristics, e.g. IQ, education, reading behaviours) accounted for 40% of the variance in pre-school children's outside-in skills (i.e. oral language skills), although the direct correlates of reading success from kindergarten were still inside-out skills (i.e. code-related skills) (Storch and Whitehurst, 2001). The authors argue that the results reaffirm the importance of the HLE by showing its *unique* influence on pre-school language ability, even in the presence of genetic and family variables (maternal IQ, education, language) and the child's age variable. A later study investigating the family reading behaviours

of 233 Head Start children also corroborates such findings (Bracken and Fischel, 2008). Regression analyses demonstrate that parent–child reading interaction constitutes a small but significant predictor of children's receptive vocabulary, story and print concepts, and general emergent literacy skills, above and beyond the influence of demographic variables.

Interestingly, much less is known about the relation between the HLE and children's acquisition of decoding skills (Goswami, 2003; Storch and Whitehurst, 2001; Whitehurst and Lonigan, 1998). A few studies examining such influences have shown that the frequency of shared reading may be related to children's concepts of print (Crain-Thoreson and Dale, 1992; Mason, 1992; Purcell-Gates, 1996) but not to their growth in phonological skills (Whitehurst and Lonigan, 2003). Instead, such code-related skills have been found to be related to more explicit parental teaching (i.e. not just language exposure) (Foy and Mann, 2003; Senechal et al., 1998), e.g. through alphabet books (Murray et al., 1996) and word games (Fernandez-Fein and Baker, 1997; Storch and Whitehurst, 2001). However, other studies have not found such associations (Payne et al., 1994; Raz and Bryant, 1990), so a definitive conclusion has yet to be reached. It is safe to assume, nonetheless, that different home practices may be differentially associated with aspects of children's language and literacy development, i.e. parent–child reading and parental teaching are probably independent factors. Recent findings from a British *Effective Pre-school and Primary Education* study demonstrate this most clearly using a nationally representative sample of more than 2,800 children (Sylva et al., 2011). Taking into account the nested nature of the data, hierarchical linear modelling was carried out, controlling for a host of child and family background variables. The results indicate that home learning activities with the alphabet and other adult-led play with letters and numbers predict children's code-related skills (i.e. alphabet knowledge and phonological awareness), whereas frequent reading, library visits and learning activities with songs, poems and rhymes contribute uniquely to their oral language development (i.e. vocabulary and verbal comprehension) over the pre-school period (age 3–5).

In terms of the significance of the HLE for Hong Kong children's L2 acquisition, one can only speculate, as very few studies have been conducted. For most families, the home language will be predominantly Cantonese, but given the high status of English in the community, parents are often anxious to support their child's English learning as much as possible, even though they are non-native speakers themselves. A recent experimental study investigated the effects of dialogic parent–child reading in English on 51 Hong Kong

kindergarteners, who were assigned randomly to one of three conditions: dialogic reading (DR), typical reading (TR) or control. The results were inconclusive, as intergroup comparisons showed non-significant interaction effects across time among the three groups, but intra-group gains across the 12-week intervention suggest that TR could enhance English word-reading skills, while DR could promote phonological awareness in both Chinese and English (Chow et al., 2010).

Many families also employ a live-in domestic helper, mostly from the Philippines, who plays an important role in the children's upbringing. Hence, some children may receive additional L2 exposure at home, but possibly in 'some form of English interlanguage. . .where the English acquired by the children may bear some Tagalog characteristics' (Yip and Matthews, 2007: 11). Nevertheless, it is generally believed that early home literacy experiences support subsequent literacy development, *regardless of language* (Hu and Commeyras, 2008; Jia, 2003; Jia and Aaronson, 2003). So time spent on literacy activities in the native language is not necessarily time lost with respect to L2 acquisition. Therefore, in theory, family literacy practices in both L1 and L2 can be significant predictors of L2 reading achievement (Reese et al., 2000).

Conclusion

Clearly, the majority of research on emergent literacy (and emergent literacy environments) has been conducted on L1 English-speaking children. The extent to which established concepts and empirical findings are readily applicable to L2 children is unclear, but some research suggests that *child* L1 and L2 acquisition patterns and rates may be very similar overall (Paradis, 2007b), and that the same general processes are at the very centre of all language acquisition (McLaughlin, 1978). The potential effects of bilingualism and cross-linguistic transfer cannot be ignored, though they may only result in greater individual variation within the L2 population, without affecting the basic developmental sequence. It is important to emphasize that one is not arguing that L2 literacy development is an exact replica of L1, but models and principles derived from L1 research could be cautiously adopted as a theoretical framework for analysing L2 phenomena (Gass and Selinker, 2008; Lesaux and Geva, 2006), although they need constant critique and scrutiny.

The specification of a complete model of L2 emergent literacy development is not possible given current research, but as a first step in tackling this

problem, a conceptual framework is proposed, and the Hong Kong Chinese–English bilingual population is used as an example. The hypothesized constructs and connections shown in Figure 1 are drawn from the literature reviewed above: first, like the SEM constructed by Storch and Whitehurst (2002), it conceptualizes (and operationalizes) emergent literacy as a two-domain construct, code-related and oral language skills, which are linked in the kindergarten period and together predict early reading achievement (mainly decoding rather than comprehension) in early primary school. Although some suggest that general L2 oral proficiency is only marginally related to accurate L2 word reading skills (Geva and Wang, 2001; Geva et al., 2000; Roberts and Neal, 2004), this conclusion may be premature. It is plausible that like L1 emergent literacy development, early L2 oral language skills exert substantial influence on later word-reading ability through indirect means, so potential mediated (through L2 code-related skills) predictive pathways have been included in the framework. Second, the possibility of cross-linguistic (phonological) transfer from Chinese to English is also taken in account. Phonological awareness is conceptualized as a global construct (subsumed under the broader domain of code-related skills), defined by the variance *common* to measures of all phonological units, regardless of whether they are assessed in (or thought to originate from) the L1 or L2. This is based on research by Lonigan et al. (2000) and that in earlier studies (Stahl and Murray, 1994; Wagner et al., 1994), which suggests that phonological sensitivity is a unitary construct represented by sensitivity to onset-rimes, syllables and phonemes (Lonigan et al., 2000). So, when measuring phonological sensitivity in Chinese ELLs, presumably the construct will include suprasegmental information such as tones. Third, potential home environment factors are integrated into the framework, indicating that they may exert an indirect influence prior to school entry.

Although this is only a preliminary conceptual framework, it serves as a useful starting point by sketching out the bigger picture and guards against the tendency of past studies to concentrate solely on one emergent literacy domain (e.g. focusing exclusively on phonological-processing skills, while largely neglecting or underestimating oral language skills) at one particular point in time. Given the complexities of the SLA process, it is unlikely that a single research design or methodology will be able to address all of the developmental interrelationships. However, there is a distinct need for multivariate analyses involving longitudinal samples. For example, it would be ideal to track L2 children's emergent literacy development annually from the beginning of kindergarten to at least the early primary grades. The test battery should be

comprehensive and psychometrically sound and include a wide range of code-related and oral language predictors as well as control measures (e.g. non-verbal ability, general language aptitude etc.). Specifically regarding children's phonological awareness, it is important not only to assess different phonological units but also to select tests that are age-appropriate and conceptually valid (e.g. perhaps reconsidering how phonemic awareness is typically measured). Also, the quality of the HLE and the quantity of language input from home prior to kindergarten should likewise be examined in a rigorous manner (e.g. in-depth parental interviews) and incorporated into the empirical model. Furthermore, the preferred analytical strategy would be latent-variable SEM, which is better able to separate errors in measurement and can typically account for more variance than traditional multivariate regression models (Storch and Whitehurst, 2001). When the phenomenon of interest is complex and multidimensional, SEM is the only analysis that allows complete and simultaneous tests of all the relationships (Cheung and Lau, 2008). Hopefully, such a study would enable the full conceptual framework of L2 emergent literacy development to be empirically evaluated and subsequently amended. Ultimately, it is hoped that such work will contribute to evidence-based methods for early L2/bilingual instruction and intervention in reading difficulties. Hence, this review merely represents a first step in this ambitious endeavour, and there remains much room for future research in this young but exciting field.

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