Journal of Neurolinguistics 50 (2019) 149–161

Contents lists available at ScienceDirect

Journal of Neurolinguistics

journal homepage: www.elsevier.com/locate/jneuroling

Deconstructing and reconstructing cross-language transfer in bilingual reading development: An interactive framework

Sheila Cira Chung*, Xi Chen, Esther Geva

Ontario Institute for Studies in Education, University of Toronto, ON, Canada

A B S T R A C T

The concept of cross-language transfer is central in bilingual reading development. This is because researchers and educators search for the conditions that allow learning that takes place in one language to enhance learning in the other language (Perkins & Salomon, 1992). In the past, the research focus was primarily on cross-language transfer in spoken language. However, since the 90s, cross-language transfer has been studied in relation to literacy aspects, such as word reading, spelling, reading comprehension, and writing. One can find several useful cross-language transfer frameworks in the literature: the contrastive-typological framework (Lado, 1964), the linguistic interdependence framework (Cummins, 1981), the common underlying cognitive process (Geva & Ryan, 1993), and the transfer facilitation model (Koda, 2008). Many studies on L2 transfer have been situated in one of these frameworks, though some treat them as complementary in nature. In what follows, we first briefly describe the core characteristics of each framework. We then present a systematic review of the empirical studies that have been conducted to examine cross-language transfer. Finally, based on the available theoretical and empirical evidence, we propose an interactive framework in an attempt to capture the complex linguistic and cognitive processes involved in cross-language transfer.

1. Theoretical frameworks of cross-language transfer

1.1. The contrastive-typological framework

The origins of the typological or contrastive framework are closely tied to behaviorism and learning theories. These early notions of transfer of learning gained momentum in the domain of L2 learning, and in particular with regard to the learning of L2 grammar. According to Lado (1957)'s contrastive analysis hypothesis:

> Individuals tend to transfer the forms and meanings, and the distribution of forms and meanings of their native language and culture to the foreign language and culture– both productively when attempting to speak the language and to act in the culture, and receptively when attempting to grasp and understand the language and the culture as practiced by natives. (p. 2)

Lado (1957, 1964) believed that L2 learners capitalize on their native language, and that cross-linguistic differences in L2 acquisition can be predicted on the basis of a systematic analysis and comparison of specific features of the first language (L1) and L2. Similarly, it is possible to predict what elements of a given L2 would be easy or difficult to acquire for learners coming from specific

* Corresponding author. Department of Applied Psychology and Human Development, OISE/University of Toronto, 252 Bloor Street West – 9-209, Toronto, ON, M5S 1V6, Canada.
E-mail address: sheila.chung@mail.utoronto.ca (S.C. Chung).

https://doi.org/10.1016/j.jneuroling.2018.01.003
Received 10 April 2017; Received in revised form 19 December 2017; Accepted 17 January 2018
Available online 08 March 2018

L1 backgrounds (König & Gast, 2008). In other words, transfer can be "positive" or "negative". When specific features are shared by two languages, "positive transfer" is expected such that learning these features in the L2 will be easier than when the L1 does not include these features. Examples of positive transfer include transfer of lexical knowledge (cognates) between two related languages, such as English and French (Hipfner-Boucher, Pasquarella, Chen, & Deacon, 2014) and grapheme-phoneme recognition in English by Spanish-speaking children (Nagy, García, Durgunoğlu, & Hancin-Bhatt, 1993; Ramírez, Chen, Geva, & Kiefer, 2010). When the structures are very different from each other, "negative transfer" or "interference" can occur from the L1. For example, Robertson (2000) observed that because the definite article is not used in Chinese, novice learners of English whose L1 is Chinese tend to underuse *the* in obligatory contexts in English (followed by overuse as proficiency improves). The contrastive framework emphasizes the importance of comparing systematically linguistic structures in L1 and L2, and considers how similarities and differences affect the learning of specific features in the L2.

A problem with the contrastive framework is that not all transfer errors can be classified as "positive" or "negative". A more complex and nuanced framework is that of "interlanguage" (Selinker, 1972), which refers to the L2 learner's evolving system of rules regarding the L2. It develops from various processes that take place as individuals learn the L2. These include transfer from the L1, as well as contrastive interference from the L2, and an overgeneralization of newly encountered rules. Paradis, Genesee, and Crago (2011) argue that many errors that children commit in the process of learning an L2 can be better understood from a perspective that considers jointly transfer, development, and interlanguage. Errors that reflect negative transfer from the L1 may be more noticeable in early stages of L2 acquisition (Zdorenko & Paradis, 2008), whereas developmental error patterns may be more typical of the interlanguage of children whose L2 is better developed.

1.2. The linguistic interdependence hypothesis

Another prominent theoretical framework that concerns L1-L2 transfer is the linguistic interdependence hypothesis (Cummins, 1979, 1981). Influenced by cognitive psychology, the interdependence framework states that:

> To the extent that instruction in Lx is effective in promoting proficiency in Lx, transfer of this proficiency to Ly will occur provided there is adequate exposure to Ly (either in school or environment) and adequate motivation to learn Ly (1981, p. 29).

This hypothesis postulates that proficiency developed in one's L1 can transfer or facilitate L2 learning. However, this transfer depends on the extent to which the learner has had high quality instruction in the L1 and sufficient language proficiency in the L2 (Cummins, 2012). The interdependence framework underscores the importance of distinguishing between cognitively and conceptually demanding and less demanding knowledge, and the conditions under which the learner can display transfer of knowledge cross-linguistically. Of primary interest in this framework are the conditions that facilitate the transfer of academically demanding tasks, such as reading comprehension. It is worth noting that studies conducted within the interdependence framework often utilize correlational and regression-based approaches. Such studies typically seek to demonstrate a correlation between parallel constructs or mediating skills that are relevant both in the L1 and L2 (e.g., Royer & Carlo, 1991).

The linguistic interdependence hypothesis has played a major role in defining research and policies concerning L2 literacy development. At the same time, it has been criticized for lack of specificity concerning the definition of interdependence and lack of clarity in explaining what is actually being transferred (Genesee, Geva, Dressler, & Kamil, 2006). Genesee et al. (2006) maintain that the interdependence hypothesis is useful for explaining "procedural" knowledge that is essential for cognitively demanding academic tasks, such as defining the meaning of words, and the application of metacognitive and comprehension monitoring strategies. However, this hypothesis is not adequate for identifying specific skills or abilities that are transferred. Not all aspects of L1 development are equally facilitative of L2 development, and cross-linguistic transfer may only take place when there are shared contextual supports for the transfer.

1.3. The common underlying cognitive processes

It is imperative to remember that while correlations point to an association between variables (e.g., word reading) in L1 and L2, the precise causal nature underlying these associations has not been specified. To this end, researchers study the extent to which underlying cognitive processing skills that support acquisition of specific language and literacy skills in the L1 also support parallel skills in the L2 (e.g., Geva, Wade-Woolley, & Shany, 1997; Geva & Ryan, 1993; Jared, Cormier, Levy, & Wade-Woolley, 2013). According to the common underlying cognitive processes framework, correlations between lower level parallel tasks in L1 and L2 (e.g., decoding accuracy and fluency) do not necessarily mean that skills acquired in the L1 context "transfer" to the L2; instead, shared cognitive processes underlie performance in the L1 and the L2 and explain observed associations between similar L1-L2 tasks. Thus, correlations can be expected between L1 and L2 reading skills, even when the orthographies under acquisition vary in complexity, and that children who experience reading difficulties in one orthography will experience reading difficulties in another orthography. General cognitive processing skills such as working memory, phonological awareness, and rapid automatized naming, are thought to be part of one's cognitive make-up and less susceptible to intentional manipulation. These cognitive components do not merely *transfer* from the L1—they *underlie* L1 and L2 processes (e.g., accurate and fluent word reading) and can explain to some extent correlations among higher order processes across the two languages. The common underlying cognitive processes framework states that individual differences in reading skills in L1 and L2 can be predicted by a common set of underlying cognitive constructs.

1.4. The transfer facilitation model

Koda (2008) proposed the transfer facilitation model to explain how metalinguistic skills (e.g., phonemic awareness, morphological awareness) that develop in one language contribute to the development of reading skills in the other language. According to Koda (2008), transfer is "an automatic activation of well-established first-language competencies, triggered by second-language input" (p.78), which is non-volitional and non-selective. That is, transfer takes place regardless of learners' intent and cannot be easily controlled. In this regard, Koda views transfer as a dynamic, rather than static process given the constant interplay between well-established L1 competencies and continuous exposure to L2 print input. She outlines three key assumptions that underlie this argument:

> 1. For transfer to occur, the competences to be transferred must be well rehearsed—to the point of automaticity—in the first language; 2. Transfer is not likely to cease at any given point in second-language development; and 3. Transferred competencies will continuously mature through processing experience with second-language input. (pp. 78–79)

Koda argues that metalinguistic skills developed in the L1 are accessible cross-modally, from L1 spoken language to L2 reading development. In other words, the transferred skills under investigation are in an oral language form, while the impacted abilities are in the written form, operating across two different language modalities. There is considerable evidence that supports the transfer facilitation model. To illustrate, performance on phonemic awareness tasks in the L1 predict word reading skills in the L2, not only when the two languages are typologically similar and rely on the same alphabet (e.g., Comeau, Cormier, Grandmaison, & Lacroix, 1999; for English-French; Durgunoğlu, Nagy, & Hancin-Bhatt, 1993; for English-Spanish), but also when the two languages are typologically dissimilar (e.g., Wade-Woolley & Geva, 2000; for English and Hebrew; Wang, Perfetti, & Liu, 2005; for English and Chinese). According to Koda, what is transferred is not merely a set of rules, but form-function relations that L2 users have acquired in their L1.

Notably, the scope of the transfer facilitation model is restrictive. The conceptualization of transfer is reduced to L1 metalinguistic skills that have already achieved automaticity and are thus "transfer ready". Koda (2008) maintains that "such a restriction is advantageous, perhaps even necessary in theory formation because the restriction enables the model to address a range of critical issues in a theoretically coherent fashion" (p. 78). The restriction, however, limits the extent to which the model can make predictions about cross-language transfer among diverse groups of L2 learners. For instance, young L2 learners who are developing L1 and L2 simultaneously may not possess L1 metalinguistic skills that are readily available to transfer in L2 learning according to Koda's criteria. However, recent studies have reported transfer from L1 metalinguistic skills to L2 literacy in this population, suggesting that automaticity in L1 metalinguistic skills may not be necessary (e.g., Chen, Xu, Nguyen, Hong, & Wang, 2010; Chung, Chen, & Deacon, 2017; Miller et al., 2006; Pasquarella, Deacon, Chen, Commissaire., & Au-Yeung, 2014). At the same time, findings of L2 to L1 transfer have also been reported across these studies, even though children in these studies were still beginning learners of L2. Thus, metalinguistic skills in both L1 and L2 vary in their availability for transfer.

2. Empirical research of cross-language transfer

In this section, we review empirical research on cross-language transfer. Based on available literature, we focus on metalinguistic skills (phonological awareness, morphological awareness, and orthographic processing), vocabulary, and reading comprehension (reading comprehension performance and strategies) in the context of the following educational settings: bilingual (French immersion, dual-language, and transitional bilingual program), mainstream English, and heritage and foreign language programs. We conducted electronic searches of the PsycINFO and ERIC databases of empirical studies published between 1993 and 2017, using combinations of the following descriptors: *cross-language transfer*, *cross-linguistic transfer, L1*, *L2*, *bilingualism, bilingual education*, *reading, spelling, phonological awareness, morphological awareness, orthographic processing, orthographic knowledge, vocabulary, reading comprehension, reading comprehension strategies, English language learners, English as a foreign language, transitional bilingual programs*. In the summary that follows, we relate the empirical evidence to the transfer theories presented above and discuss the strengths and weaknesses of each theoretical framework.

2.1. Transfer of phonological awareness

Phonological awareness is defined as the ability to manipulate and reflect on sound units of words. Sound units of words include at least three levels: syllable, onset-rime, and phoneme. Studies show that syllable awareness develops before onset-rime awareness, which develops before phonemic awareness (Treiman & Zukowski, 1991). Phonological awareness plays a critical role in the development of word reading skills because readers who attend to sound structure of words are better able to map letters and letter combinations onto sound units (Wagner, Torgesen, & Rashotte, 1994).

There is substantial support of cross-language relations between phonological awareness in either L1 or L2 and reading-related skills in the other language among learners of diverse language pairings. In their landmark study, Durgunoğlu et al. (1993) showed that for first grade Spanish-speaking children attending transitional bilingual schools, phonological awareness and word recognition in Spanish were significantly correlated with word and pseudoword recognition in English. These findings extend to studies that examined L2 learners acquiring language pairs that are typologically related, such as English and French (Comeau et al., 1999; Haigh, Savage, Erdos, & Genesee, 2011; Lafrance & Gottardo, 2005), as well as distantly related language pairs, such as Chinese and English (Gottardo, Chiappe, Yan, Siegel, & Gu, 2006; Gottardo, Yan, Siegel, & Wade-Woolley, 2001; Keung & Ho, 2009), Hebrew and English

(Wade-Woolley & Geva, 2000), Russian and English (Abu-Rabia, 2001), and Korean and English (Wang, Park, & Lee, 2006). Furthermore, transfer of phonological awareness also emerge at the construct level. Phonological awareness skills measured in the L1 and L2 are significantly correlated in a number of language combinations (see Cisero & Royer, 1995; Durgunoğlu, 2002; Genesee & Geva, 2006; Saiegh-Haddad & Geva, 2008).

More direct evidence of transfer of phonological awareness appears in studies that have assessed the effectiveness of instructional programs. Across these studies, the direction of transfer of phonological awareness emerges from L1 to L2 and vice versa. In a longitudinal study in which French immersion children receiving an 18-week English phonological awareness training in grade 1, Wise, D'Angelo and Chen (2016) showed significant gains on both phonological awareness and word reading in French after the intervention, and these gains were maintained for the next two years. In another study, Chen et al. (2010) observed that first grade Mandarin-speaking children in China who received more intensive English instruction developed higher levels of phonological awareness in both English and Chinese over a period of two years as compared to peers who received less intensive English instruction. In the same vein, at-risk Hispanic students who received a reading intervention in Spanish (which included training on Spanish phonological awareness skills) in grade 1 outperformed comparison students on English letter-word identification in grade 2 (Cirino et al., 2009). Similar findings have also been reported in research involving multilingual children who spoke three languages (Schwartz, Geva, Share, & Leikin, 2007).

Although phonological awareness is considered a language-general construct, transfer of phonological awareness is influenced by the phonological features of the language pairs involved. Bruck and Genesee (1995) showed that English-speaking children in a French immersion program had more advanced syllable awareness than their peers in the English stream in grade 1. The advantage reflects the salient phonological characteristics of French. Likewise, Bialystok, McBride-Chang, and Luk (2005) reported superior performance of Chinese-speaking children in Canada on onset phoneme deletion tasks in both English and Chinese compared to their peers in Hong Kong learning English as an L2. Because English has a more complex phonological system, a greater amount of English exposure led to superior performance on the Chinese phonological awareness tasks for the Canadian-Chinese children through transfer from English to Chinese.

Overall, empirical research investigating the transfer of phonological awareness among bilingual learners has firmly established that phonological awareness in the L1 or L2 transfers across languages regardless of typological differences. These studies have also reported transfer from the L1 to the L2 (as well as the L3), and from the L2 to the L1, supporting the notion that phonological skills represent a language-general construct, independent of the specific languages under acquisition by the bilingual learner. In other words, phonological awareness may be a “modularized” skill (Shany, Geva, & Melech-Feder, 2010) that underlies reading development in each of the languages for bilingual children. On the other hand, the pattern of transfer reflects the phonological features of the languages involved. It should be noted that the evidence of the crossover effect of phonological awareness on reading-related outcomes beyond word-level skills (i.e., vocabulary, reading comprehension) is limited (Carlisle & Beeman, 2000; Manis, Lindsey, & Bailey, 2004; Proctor, August, Carlo, & Snow, 2005).

2.2. Transfer of morphological awareness

Morphological awareness is the ability to reflect on and manipulate the smallest units of meaning in words (i.e., morphemes) and use word formation rules in one's language (Kuo & Anderson, 2006). Morphological awareness consists of three key components: derivational awareness (e.g., the meaning of *unfriendly* can be deduced by analyzing *un* + *friend* + *ly*), inflectional awareness (e.g., *talked* is the past tense of *to talk*), and compound awareness (e.g., fire + truck = firetruck). An increasing body of research indicates that morphological awareness is associated with word reading, vocabulary knowledge, spelling, and reading comprehension among monolingual and bilingual learners (e.g., Bindman, 2004; Carlisle, 2000; Pacton & Deacon, 2008; Ramírez et al., 2010; Saiegh-Haddad & Geva, 2008).

Research indicates a cross-language relation between morphological awareness and word reading among L2 learners. However, the direction of the relation is not clear. For instance, Ramírez et al. (2010) showed that among fourth and seventh grade Spanish-speaking English language learners (ELLs), Spanish derivational awareness explained unique variance in English word reading, but no transfer was observed from English to Spanish. Saiegh-Haddad and Geva (2008) found that morphological awareness in Arabic, which consists of an opaque morphological system relative to English, predicted word reading in English among English-Arabic students in third to sixth grade. Among Chinese ELL students in grades 2 and 4, Wang, Cheng, and Chen (2006) reported a significant correlation of English compound awareness with Chinese character reading. The researchers attributed the direction of the transfer to the greater proficiency in L2 than L1. Following French immersion children from grades 1 to 3, Deacon, Wade-Woolley, and Kirby (2007) found that English inflectional awareness in grades 1 and 2 was related to French word reading, whereas French inflectional awareness in grades 2 and 3 predicted English word reading. Thus, inflectional awareness transferred from children's more proficient language (English) to the less proficient one (French) in the early stages of L2 learning. As children gained greater proficiency in French, the direction of transfer was reversed.

Transfer of morphological awareness to vocabulary has also been observed. Pasquarella, Chen, Lam, Luo, and Ramírez (2011) found that English compound awareness was a significant predictor of Chinese vocabulary and reading comprehension for Chinese-English bilinguals in first, second, and fourth grade. Notably, transfer was not observed from Chinese compound awareness to English outcomes. The researchers speculated that because there are fewer compounds in English than Chinese and compound awareness is less important for English literacy, there is little need for transfer to occur from Chinese to English. Also relevant is a study by Hancin-Bhatt and Nagy (1994) showing that Spanish-English students in grades 4, 6, and 8 recognized cognate stems of suffixed words more easily (e.g., *facility*) than noncognate stems (e.g., *frosty*), indicating that transfer of lexical knowledge facilitates derivational

awareness among L2 students learning etymologically related languages.

Morphological awareness has also been found to contribute to reading comprehension across languages. For example, Bérubé and Marinova-Todd (2014) reported that English derivational awareness was a significant predictor of French reading comprehension among grade 6 multilingual students in French immersion programs who spoke a heritage language at home and were learning English (L2) and French (L3) at school. In a study described earlier, Wang, Cheng et al. (2006) also reported transfer of English compound awareness to Chinese reading comprehension but not in the other direction for Chinese ELL students. In contrast, Zhang, Koda, and Sun (2014) observed that among grade 5 and 6 Chinese-speaking students learning English in China, English compound awareness was not related to Chinese reading comprehension, whereas Chinese compound awareness was related to English reading comprehension. Notably, the Chinese students' exposure to English was very limited in this study compared to previous studies (e.g., Deacon et al., 2007; Pasquarella et al., 2011), which may explain the direction of the transfer from the L1 to the L2.

Evidence of transfer of morphological awareness has been reported in experimental studies (e.g., Wang, Cheng et al., 2006; Wang, Yang, & Cheng, 2009; Cheung et al., 2010; Pasquarella et al., 2011). Zhang et al. (2010) provided grade 5 Chinese children learning English as a foreign language with training in either Chinese or English compounding. Students trained in Chinese morphology outperformed their peers who received no instruction on an English compound task, indicating transfer of compound awareness from Chinese to English. Additionally, reverse transfer from English to Chinese was observed among students who received training in English morphology, but only in those who had high reading proficiency in both languages. Ramírez, Chen, Geva, and Luo (2011) reported that English monolinguals and Spanish-speaking ELLs outperformed Chinese-speaking ELLs on English derivational awareness in grades 4 and 7. On the other hand, English monolinguals and Chinese-ELLs performed on par on English compound awareness, whereas the Spanish-speaking ELLs performed lower than their monolingual peers. The authors attributed the findings to shared derivational features between English and Spanish and shared compounding features between English and Chinese.

Overall, transfer of morphological awareness appears to be a complex process influenced by multiple factors. The first factor is morphological complexity of the languages under acquisition, in that transfer tends to occur from the more morphologically complex language to the less complex language (e.g., Ramírez et al., 2010; Saiegh-Haddad & Geva, 2008; Schiff & Calif, 2007). The second factor is language proficiency of the L1 and L2. In most cases morphological awareness seems to transfer from the more proficient language to the less proficient one (e.g., Bérubé & Marinova-Todd, 2014; Deacon et al., 2007; Pasquarella et al., 2011; Schiff & Calif, 2007; Zhang et al., 2014), but transfer is limited when learners are less fluent in the more complex language (e.g., Saiegh-Haddad & Geva, 2008). Finally, transfer of morphological awareness is conditioned by morphological similarities between the languages under investigation. Transfer typically takes place when the language pairings share aspects of morphology. For example, compound awareness has been observed to transfer between Chinese and English (e.g., Pasquarella et al., 2011; Ramírez et al., 2010; Zhang et al., 2010), and derivational awareness between English and Spanish (e.g., Pasquarella et al., 2011) due to shared structures in compound and derivational morphology respectively.

2.3. Transfer of orthographic processing

Orthographic processing refers to the “ability to form, store, and access the orthographic representation” of words (Stanovich & West, 1989, p. 404). It is a print-based skill related to word-level reading among monolingual and bilingual children (Cunningham, 2006; Deacon, Wade-Woolley, & Kirby, 2009; Roman, Kirby, Parrila, Wade-Woolley, & Deacon, 2009). Traditionally in bilingual research, studies on students learning language pairings that do not share the same alphabet or writing system have converged on the conclusion that orthographic processing is language specific. To illustrate, studies on Chinese-speaking students learning English did not observe a cross-language effect of orthographic processing on reading between the two languages (Gottardo et al., 2001; Keung & Ho, 2009). Similar findings have emerged in studies involving English learners whose L1 is Russian (Abu-Rabia, 2001), Hebrew (Abu-Rabia, 1997), Korean (Wang, Park, et al., 2006), and Persian (Arab-Moghaddam & Sénéchal, 2001).

Recently, a growing body of research has yielded evidence of transfer of orthographic processing to reading in language pairs represented by the same alphabetic script such as English-French and English-Spanish (Deacon, Chen, Luo, & Ramírez, 2013a, 2013b, 2009; Commissaire, Duncan, & Casalis, 2011; Commissaire, Pasquarella, Chen, & Deacon, 2014; Sun-Alperin & Wang, 2011). For example, Deacon et al. (2009, 2013b) showed a bidirectional cross-language relation between lexical orthographic processing and word reading among grade 1 and 2 French immersion students. Similarly, there is evidence that Spanish orthographic processing contributed to English word reading among Spanish-speaking ELL students in grades 2 and 3 (Sun-Alperin & Wang, 2011), as well as in grades 4 and 7 (Deacon et al., 2013a).

With respect to spelling, Chung et al. (2017) reported that for grade 1 French immersion children, French orthographic processing was related to English spelling, but English orthographic processing did not predict French spelling. Given that English deviates from letter-sound correspondences more frequently than French, it is possible that English spelling requires children to rely on orthographic processing skills across languages, whereas French orthographic skills alone are sufficient to support French spelling. Sun-Alperin and Wang (2011), however, did not find transfer of orthographic processing to spelling in either direction among Spanish-speaking ELLs. Finally, at the construct level, cross-language correlations for orthographic processing measures have been observed among native French-speaking students learning English in grades 6 and 8 (Commissaire et al., 2011).

Qualitative studies on spelling errors have corroborated transfer of orthographic processing to spelling among L2 learners (for a review, see Figueredo, 2006). Rolla San Francisco and colleagues (Rolla San Francisco, Carlo, August, & Snow, 2006a; Rolla San Francisco, Mo, Carlo, August, & Snow, 2006b) examined English nonword spelling in Spanish-English bilingual and English monolingual children receiving either English or Spanish instruction in kindergarten and grade 1. In both studies, Spanish-instructed students were more likely than English-instructed students to produce spellings that were orthographically acceptable in Spanish, but

incorrect in English. For example, in Spanish, /eI/ can be spelled either *ei* or *ey*. For the target English nonword *nade,* student responses of *neid* or *neyd* indicated Spanish influence. Similar evidence of L1 transfer to L2 spelling, and vice versa, has been observed in different L1-L2 combinations, including English-French (Chung, 2014; Joy, 2011; Morris, 2001), Arabic-English (Ibrahim, 1978), and Chinese-English (Wang & Geva, 2003).

To our knowledge, only one study examined the causal relation in cross-language transfer of orthographic processing. Pasquarella et al. (2014) demonstrated that French word reading in grade 1 predicted gains in English orthographic processing from grade 1 to grade 2 among French immersion students; however, French orthographic processing in grade 1 did not predict gains in English word reading. A similar temporal relation from word reading to orthographic processing was observed in an earlier study by Deacon, Benere, and Castles (2012) among monolingual English-speaking children. It seems that the orthographic choice tasks used in these studies (e.g., identifying which word looks more like a real word in a pair of homophones, *dream-dreem*, or pseudo-homophones, *baff-bbaf*) measure children's store of orthographic representations, which is an outcome rather than a predictor of word reading. Future research may consider tasks that tap into children's ability to acquire orthographic patterns, such as the orthographic learning task (Share, 1999).

Taken together, there is converging evidence of cross-language transfer of orthographic processing when the languages under acquisition share the same Roman alphabet (e.g., English-French; Chung et al., 2017; Commissaire et al., 2011; Deacon et al., 2009; Pasquarella et al., 2014; English-Spanish; Sun-Alperin & Wang, 2011). On the other hand, no evidence has been reported between languages represented by different scripts (e.g., Abu-Rabia, 2001; Gottardo et al., 2001). Due to the lack of overlapping orthographic units, languages represented by different scripts may require different underlying mechanisms for orthographic processing (Deacon et al., 2009). Thus, transfer of orthographic processing appears to be partially determined by the typological distance in the language pairings. However, the direction of cross-language transfer, as well as the temporal relation between orthographic processing and reading remain unclear.

2.4. Transfer of vocabulary

Vocabulary skills are fundamental to reading comprehension, given that one cannot understand text without knowing what the words mean, that is, without the semantic knowledge associated with words (e.g., Anderson & Freebody, 1981; Lesaux, Crosson, Kieffer, & Pierce, 2010). The importance of vocabulary is particularly evident once children have transitioned from “learning to read” in the primary grades to “reading to learn” in the upper elementary grades and beyond (Chall, 1983). L2 learners typically fall behind their L1 peers in vocabulary knowledge, particularly academic vocabulary, and consequently lag on reading comprehension, even after several years of schooling in the L2 (e.g., Farnia & Geva, 2011; de Jong, 2004).

Studies have reported that individual differences in vocabulary predict reading comprehension cross-linguistically. For example, Miller et al. (2006) reported that oral language skills assessed with a story-retelling task in either English or Spanish accounted for variance in reading comprehension across languages among Spanish-speaking ELLs in kindergarten through third grade. Li, McBride-Chang, Wong, and Shu (2012) found that Chinese (L1) vocabulary knowledge at age 8 was related to English (L2) reading comprehension at age 10 among Hong Kong Chinese children. Such studies contribute to a substantial body of research suggesting that L1 vocabulary knowledge plays an important role in comprehension of L2 texts (e.g., Carlisle, Beeman, Hull Davis, & Spharim, 1999; Lesaux et al., 2010; Lindsey, Manis, & Bailey, 2003; Nagy et al., 1993; Proctor et al., 2005, 2006).

At the same time, the cross-language relation between vocabulary and reading comprehension has not been reported consistently (see Geva & Genesee, 2006 for a systematic review). A longitudinal study following Spanish ELL students from kindergarten to grade 2 showed that English oral language skills contributed to English reading comprehension, independently of Spanish oral language (Manis et al., 2004). Similarly, Nakamoto, Lindsey, and Manis (2008) followed Spanish ELL students from third to sixth grade and found that decoding and oral language were related to later reading comprehension only within English and Spanish, but not across the two languages. These results led to the conclusion that within-language skills are more important for predicting reading comprehension. Research also suggests that different oral language measures do not produce equivalent cross-language correlations. For instance, Ordóñez, Carlo, Snow, and McLaughlin (2002) showed that vocabulary measures that tap into academically-related skills, such as providing paradigmatic responses (e.g., “a knife is a tool”) had stronger cross-language relations than communicative tasks requiring syntagmatic information (e.g., “we use knives to cut things”).

Notably, there is consistent evidence that cognate awareness, the recognition of the relation between cognates in two languages, is related to vocabulary and reading comprehension across languages (Malabonga, Kenyon, Carlo, August, & Louguit, 2008; Chen, Ramírez, Luo, Geva, & Kuo, 2012; Dressler, Carlo, Snow, August, & White, 2011; Cunningham & Graham, 2000). Cognates are words that are derived from the same linguistic origin, share the same meaning and may share phonological and orthographic features in two languages (Proctor & Mo, 2009). For example, *rapid* and *rápido* are English-Spanish cognates. Cognate awareness has been found to enhance vocabulary learning in English for Spanish-English bilinguals (e.g., Chen, Ramírez, Luo, Geva, & Ku, 2012). Furthermore, a significant relation has been reported between the ability to recognize Spanish-English cognates and English reading comprehension in Spanish-speaking students in grade 4 and above (Nagy et al., 1993; Ramírez, Chen, & Pasquarella, 2013). Recently, Hipfner-Boucher, Chen, Pasquarella, and Deacon (2014) demonstrated that English-French cognate awareness of French immersion children significantly predicted French (L2) reading comprehension.

The facilitating effect of cognate awareness on reading comprehension has been confirmed by evidence from qualitative research. Using think-aloud protocols, Jiménez, García, and Pearson (1996) reported that sixth and seventh grade Spanish-speaking ELLs who were good readers used cognate strategies to understand English narrative and expository passages. Dressler et al. (2011) taught Spanish-speaking ELL children in fourth and fifth grade to use Spanish cognates to infer meanings of unknown English words. The

strategy was found effective in resolving meaning for challenging English words. When the ELLs used strategies such as contextual clues, their success rate was lower than that of the comparison group of native English-speaking students; however, when the cognate strategy was included, their accuracy surpassed that of the comparison group.

To summarize, while some studies have shown that L1vocabulary contributes to L2 reading comprehension this finding is not consistent. A limitation of this body of research is that most studies did not distinguish between general and academic vocabulary, and it is likely that the two types of vocabulary may exhibit different transfer patterns (Ordóñez et al., 2002). It is also important to be mindful of Grabe's (2009) critique of the linguistic interdependence hypothesis, which states that L2 learners "can have weak L2 language proficiency, but use all of their L1 academic reading skills to carry out L2 academic reading tasks successfully" (p.141). Yet, L2 vocabulary may play a more prominent role in L2 reading comprehension than L1 vocabulary (e.g., Droop & Verhoeven, 2003; Verhoeven, 2000). At the same time, there is consensus with respect to the role of cognate awareness in vocabulary and reading comprehension across languages (e.g., Chen et al., 2012; Hipfner-Boucher et al., 2014; Jiménez et al., 1996; Nagy et al., 1993; Ramírez et al., 2013). Therefore, transfer of lexical knowledge to reading comprehension between etymologically related languages may be driven by cognates.

2.5. Transfer of reading comprehension strategies

Reading comprehension is a complex process that involves both lower- and higher-level skills. Lower-level skills, such as phonological awareness and decoding, facilitate word reading (National Reading Panel, 2000). Higher-level skills, including vocabulary and comprehension strategies, support comprehension (Geva, 2006; Rapp, McMaster, Kendeou, & Espin, 2007). Reading comprehension strategies refer to a set of deliberate actions readers use to monitor and repair breakdowns in comprehension (O'Malley & Chamot, 1990). These strategies include use of background knowledge, inference making, comprehension monitoring, and question generation (Anderson & Pearson, 1984; McNeil, 2011; Oakhill, Hartt, & Samols, 2005; Palincsar & Brown, 1984). In this section, we focus on the cross-language transfer of higher-level skills to reading comprehension among L2 learners.

Several studies have compared reading comprehension of students enrolled in different instructional programs. Earlier research found that students in French immersion programs initially experienced a lag in English reading comprehension compared to English-stream students because they received instruction only in French (Genesee, 1978; Geva & Clifton, 1994; Lambert & Tucker, 1972; Swain & Lapkin, 1982). However, immersion students caught up within one or two years of starting English language instruction (e.g., Genesee, 1978; Lapkin, Hart, & Turnbull, 2003; Swain & Lapkin, 1982; Turnbull, Lapkin, & Hart, 2001). This rapid progress suggests that comprehension skills developed in French can be utilized to read English. However, these studies did not account for the fact that students enrolled in French immersion programs typically come from families of higher socioeconomic status than those in English-stream programs (e.g., Lapkin et al., 2003; Turnbull et al., 2001). On the other hand, there is substantial evidence that bilingual students fall behind their monolingual peers on L2 reading comprehension (Farnia & Geva, 2013; Proctor et al., 2005, 2006; Schwartz, Share, Leikin, & Kozminsky, 2008). Therefore, comparing comprehension performance between students in different programs does not provide definitive evidence on transfer of comprehension strategies.

Another body of studies directly investigated the relation between reading comprehension across languages. Li et al. (2012) reported that reading comprehension across English and Chinese was strongly correlated for 10-year old Hong Kong Chinese children. They noted that higher-level reading comprehension strategies (e.g., vocabulary knowledge, contextual information within a passage, inferring meanings of unknown words) may be transferable between English and Chinese despite the differences in language typology. An association of reading comprehension between the L1 and L2 has also been reported among recently immigrated Chinese ELL university students in Canada and Chinese-speaking adults learning English in China (Pasquarella, 2014), and sixth-grade Hispanic students learning English in the US (Royer & Carlo, 1991). Other researchers (e.g., Kong, 2006; Tsai, Ernst, & Talley, 2010) have used self-reported questionnaires to determine transfer of L1 reading comprehension strategies to L2 among older English-Chinese students. Finally, Abu-Rabia, Shakkour, and Siegel (2013) reported that an intervention carried out in English (L2) improved both Arabic and English reading comprehension in sixth grade Arabic-speaking students learning English in Israel. The researchers speculate that this benefit may reflect the transfer of comprehension strategies from L2 to L1. Taken together, these studies suggest that reading comprehension strategies transfer across languages regardless of typological differences. However, we note that it is difficult to identify specific reading comprehension strategies that are transferred across languages given that the majority of studies adopted a correlational design.

3. An interactive transfer framework

We began this article by showing how current conceptualization concerning the relations between L1 and L2 learning can be traced to various theoretical frameworks. We then proceeded to a review of the empirical literature focused on the cross-language transfer of lower- and higher-level skills among bilingual learners. The large body of research on the relations between reading and cognitive skills in the L1 and L2 underscores the ways in which the concept of transfer has evolved and suggests that existing frameworks are conceptually inadequate to explain the learning processes of L2 learners as they improve their L1 and L2 language and literacy skills. In this section, we identify several key factors that influence the cross-language relations and propose an interactive transfer framework (see Table 1 for a summary of the frameworks).

Table 1
Summary of cross-language transfer frameworks.

Theoretical Framework	Author(s)	Strengths	Limitations
Contrastive Typological Framework	Lado (1957)	- Predicts elements of L2 that would be easy or difficult to learn from L1 backgrounds	- Not all transfer errors can be classified as positive or negative -Does not explain transfer of linguistic or metalinguistic skills to reading
Linguistic Interdependence Hypothesis *variant*: Common Underlying Cognitive Processes	Cummins (1979, 1981) Geva and Ryan (1993)	- Distinguishes between cognitive and conceptually demanding and less demanding knowledge and conditions that can display transfer of knowledge cross-linguistically -Identifies cognitive constructs that predict L1 and L2 reading	-Too general; does not specify the nature of underlying mechanisms that facilitate the transfer of metalinguistic skills -Prediction applies only partially to other constructs (e.g., orthographic processing and word reading)
Transfer Facilitation Model	Koda (2008)	-Makes cross-modal predictions between L1 and L2 for typologically similar and dissimilar language pairings	-Model is restrictive; applicable to L1 metalinguistic skills that have achieved automaticity but not transfer from L2 to L1
Interactive Transfer Framework	Chung, Chen, & Deacon (2017)	-Identifies factors that affect transfer	-The extent to which these factors interact is not specified due to a lack of empirical evidence

3.1. L1-L2 distance

Language distance between L1 and L2, in terms of the comparisons of linguistic features, is a determining factor in cross-language transfer. Both the typological-contrastive framework (Lado, 1957; see also, Geva & Siegel, 2000) and the transfer facilitation model (Koda, 2008) posit that the overlap between L1 and L2 linguistic features influences the extent that learners draw from their L1 in L2 learning. In general, transfer is more likely to occur between languages that share specific relevant features. Transfer of morphological awareness has been observed when L1 and L2 share similar morphological features, as in the case of compound awareness between Chinese and English and derivational awareness between English and French. Similarly, transfer of orthographic processing has only been found across languages represented by the same Roman script (e.g., English and French). In addition, cognate awareness is only observed among bilingual students learning etymologically-related languages (e.g., English and Spanish). Thus, transfer of these skills is subject to the linguistic features of the languages involved.

In contrast, transfer of phonological awareness (and probably other modularized skills, see Hipfner-Boucher & Chen, 2015) on the one hand, and complex reading comprehension strategies on the other hand, do not appear to be constrained by shared linguistic features. Evidence of transfer regardless of the typological distance offers support for the linguistic interdependence hypothesis (Cummins, 1981) and the common underlying processes (Geva & Ryan, 1993). In this respect, Durgunoğlu (2002) argued that competence in the L1 may transfer to L2 (and vice versa) due to shared metalinguistic concepts and strategies. At the same time, mixed findings have been reported with regard to the transfer of vocabulary knowledge across languages. Such transfer has been observed among bilingual learners of various language pairings (e.g., Lindsey et al., 2003; Verhoeven, 1994), providing support for the view that there are common cognitive skills involved in learning vocabulary across languages, such as fast mapping of new phonological or orthographic forms to their semantic referent. On the other hand, reading comprehension tends to be more strongly related to command of vocabulary within the same language (Genesee & Geva, 2006; Grabe, 2009; Manis et al., 2004; Nakamoto et al., 2008).

3.2. L1-L2 proficiency

Although cross-language transfer is clearly influenced by relative levels of proficiency in the L1 and the L2, the exact role of language proficiency in the transfer process remains unknown. Koda (2008)'s transfer facilitation model is only concerned with transfer from the L1 to the L2. She stipulates that for transfer to occur, the competences to be transferred must reach the point of automaticity in the L1. Cummins (1981, 2012) acknowledges that transfer can occur in both directions but maintains that bilingual learners must achieve sufficient language proficiency in the source language. However, neither theory identifies a precise threshold for "automaticity" or "sufficient proficiency", nor do they explain how language proficiency enables or debilitates transfer of higher-level constructs.

Notwithstanding an unspecified threshold for language proficiency, empirical evidence seems to support the notion that transfer occurs from the more proficient language to the less proficient language. Research involving students with stronger L1 proficiency has yielded findings of unidirectional transfer of metalinguistic skills from the L1 to the L2, especially in the case of morphological awareness (e.g., Wang, Cheng, et al., 2006; Wang, Park, et al., 2006; Zhang et al., 2014). In the case of stronger L2 proficiency, transfer of metalinguistic skills has been demonstrated from the L2 to the L1 (e.g., Chung et al., 2017; Pasquarella et al., 2011; Wang, Cheng, et al., 2006). Interestingly, evidence of bidirectional transfer is generated by studies involving beginning bilingual learners who have somewhat similar exposure to their two languages (e.g., Deacon et al., 2007, 2009). However, there are exceptions to the pattern. Even limited L2 proficiency seems to have an impact on L1 phonological awareness when the L2 has a more complex phonological structure than the L1 (e.g., Chen et al., 2010; Manis et al., 2004). Yet, no clear pattern has been observed for the transfer

of orthographic processing or vocabulary knowledge (e.g., Deacon et al., 2013a, 2013b, 2009; Abu-Rabia, 2001; Gottardo et al., 2001).

3.3. Language complexity

Language complexity appears to play a role in cross-language transfer. A bilingual learner may develop a heightened sensitivity to the construct in the language that has a complex structure and subsequently transfer this sensitivity to the other language. Research has found that certain groups of bilingual learners tend to outperform their peers on phonological or morphological awareness tasks (e.g., Bruck & Genesee, 1995; Chen et al., 2004; Kuo & Anderson, 2010; Ramírez et al., 2011). This advantage can be attributed to their exposure to the L1, which has more salient or distinctive linguistic features than the L2. Relatedly, morphological awareness measured in the language with a more complex morphological structure has been observed to predict reading outcomes in the other language (e.g., Ramírez et al., 2010; Saiegh-Haddad & Geva, 2008; Schiff & Calif, 2007). However, the same pattern does not seem to apply to transfer of orthographic processing, as significant correlations have been observed between Spanish orthographic processing and English reading despite the fact that English has a deeper orthography than Spanish (e.g., Deacon et al., 2013a; Sun-Alperin & Wang, 2011). It appears that language complexity is only one of the factors at play in the transfer process, and its effect is modulated by the effects of other factors described in this section.

3.4. Educational settings

Research on cross-language transfer takes place in diverse educational settings. The studies reviewed here can be classified into three main educational settings: bilingual (Canadian French immersion, dual-language, and transitional bilingual program), mainstream English, and heritage and foreign language programs. Whether it is the researcher's intention, the scope of a transfer study is constrained by the educational setting in which it is situated. For example, the goal of the Canadian French immersion program is to develop proficiency in both French and English. Children attending this program learn French as an L2 through formal schooling, while acquiring English (the dominant societal language) informally at the same time. This context allows studies to examine transfer of skills from the L1 to the L2 as well as from the L2 to the L1 (e.g., Bruck & Genesee, 1995; Chung et al., 2017; Deacon et al., 2009, 2007; Pasquarella et al., 2014). In contrast, in mainstream English programs, ELLs from diverse L1 backgrounds are immersed in English instruction with minimal attention paid to the L1. As a result, studies conducted in these programs tend to focus where feasible on how L1 skills can support English literacy. Similarly, studies involving adult L2 learners with well-established L1 skills are only interested in transfer from the L1 to the L2 because the purpose of the program is to foster L2 proficiency.

3.5. Research methodology

Typically, cross-language transfer has been explored in concurrent or cross-sectional studies, in which metalinguistic skills in one language are related to reading outcomes in another language. While this design is useful for detecting associations, it fails to reveal temporal and causal relations. This issue is further compounded by the heterogeneity of bilingual samples. For example, Lindsey et al. (2003) reported that in the Spanish-English transitional bilingual program, the criteria for the transition were left up to individual teachers. As a result, even in the same school children were formally introduced to English at different times. This may lead to a heterogeneous sample of children with varying exposure to Spanish and English. As such, the lack of consistent analyses across studies produces a limited view of cross-language relations. Recently, there has been a shift from reporting on correlational relations to examining developmental changes and causality under tightly controlled conditions (e.g., Abu-Rabia et al., 2013; Cirino et al., 2009; Farnia & Geva, 2011, 2013; Pasquarella et al., 2014; Wise et al., 2016). For example, Farnia and colleagues (Farnia & Geva, 2011, 2013) and Pasquarella et al. (2014) followed the development of reading sub-skills longitudinally, whereas Abu-Rabia et al. (2013), Cirino et al. (2009), and Wise et al. (2016) employed an intervention design. Such advances in research methodology lead to a growth in longitudinal and experimental studies which can reveal causal relations in cross-language transfer. Finally, with a shift away from an “Anglocentric research agenda” (Share, 2008), an increasing number of transfer studies now focus on bilingual children from a broad array of language pairings.

4. Conclusion

In our opinion, cross-language transfer is interactive in nature. It is influenced by a number of cognitive and linguistic factors, including the relatively language general or language specific nature of the construct, L1-L2 distance, L1-L2 proficiency and language complexity (see Hipfner-Boucher & Chen, 2015 for a more elaborate discussion on the nature of construct). At the same time, it is constrained by sociolinguistic and social-cultural factors such as age of acquisition, immigration experience, educational settings, and extent of exposure to the L1 and L2. Finally, the validity and generalizability of the results depend on the scientific rigor of the research design. Transfer of a certain construct appears to be the result of the interaction of all or most of the factors mentioned above, though it is unclear how the interaction takes place. The complexity of the mechanisms involved, in combination with the heterogeneity of the bilingual population, makes it difficult to predict the direction (from the L1 to L2 or vice versa) and extent of transfer for any given construct. For example, transfer of phonological awareness is not constrained by L1-L2 distance or proficiency, but it is sensitive to phonological features of the languages involved. On the other hand, L1-L2 distance appears to be the determining factor for transfer of morphological awareness and orthographic processing.

From the perspective of an interactive framework, while each of the existing theories makes a substantial contribution to our understanding of cross-language transfer, all of them have limitations. Specifically, the contrastive framework focuses on the impact of language complexity on the acquisition of an L2 linguistic feature, but it was not designed to explain transfer of linguistic or metalinguistic skills to reading. The linguistic interdependence hypothesis underscores the overlapping processes in L1 and L2 acquisition while taking L1-L2 proficiency into consideration. The hypothesis, however, is too broad and lacks the capacity to make specific predictions of the direction and extent of the transfer of any given construct (Genesee et al., 2006). The common underlying processes theory advances the interdependence hypothesis by specifying the nature of transfer for cognitive variables that are deemed language general (e.g., phonological awareness), but it applies only partially to other constructs (e.g., vocabulary knowledge). The transfer facilitation model is the most elaborate theory of transfer to date. It highlights the non-volitional and automatic nature of transfer and considers the effects of multiple factors, such as L1-L2 distance, L1-L2 proficiency and language complexity. However, the model only accounts for transfer among older L2 learners who have established L1 skills but excludes young children in the early stages of L2 acquisition. It is also important to be cognizant of the fact that to date, with a few exceptions (e.g., Kahn-Horwitz, Kuash, Ibrahim, Schwartz, 2014; Schwartz et al., 2007), research has not addressed adequately transfer when more than two languages are involved.

To conclude, while theories of cross-language have evolved over the years, currently there is no single theory that can provide a consistent and comprehensive account of the empirical evidence available. Moreover, although there is substantial evidence for transfer of phonological awareness, other constructs, such as orthographic processing and reading comprehension strategies, are less understood. The review of literature presented in this article provides overwhelming evidence that transfer is a complex process that involves units of analyses varying in complexity and that is determined jointly by multiple factors. Yet, it remains unknown exactly how the factors interact with each other.

References

Abu-Rabia, S. (1997). Verbal and working memory skills of bilingual Hebrew-English speaking children. *International Journal of Psycholinguistics, 13*, 25–40.

Abu-Rabia, S. (2001). Testing the interdependence hypothesis among native adult bilingual Russian-English students. *Journal of Psycholinguistic Research, 30*, 437–455.

Abu-Rabia, S., Shakkour, W., & Siegel, L. (2013). Cognitive retroactive transfer (CRT) of language skills among bilingual Arabic-English readers. *Bilingual Research Journal, 36*, 61–81. http://dx.doi.org/10.1080/15235882.2013.775975.

Anderson, R. C., & Freebody, P. (1981). Vocabulary knowledge. In J. T. Guthrie (Ed.). *Comprehension and teaching: Research reviews* (pp. 77–117). Newark, DE: International Reading Association.

Anderson, R. C., & Pearson, P. D. (1984). A schema-thematic view of basic processes in reading comprehension. In P. D. Pearson, R. Barr, M. L. Kamil, & P. Mosenthal (Eds.). *Handbook of reading research* (pp. 255–291). New York: Longman.

Arab-Moghaddam, N., & Sénéchal, M. (2001). Orthographic and phonological processing skills in reading and spelling in Persian/English bilinguals. *International Journal of Behavioral Development, 25*(2), 140–147. http://dx.doi.org/10.1080/01650250042000320.

Bérubé, D., & Marinova-Todd, S. H. (2014). The effect of sociolinguistic factors and English language proficiency on the development of French as a third language. *International Journal of Bilingual Education and Bilingualism, 17*(4), 465–483. http://dx.doi.org/10.1080/13670050.2013.820686.

Bialystok, E., McBride-Chang, C., & Luk, G. (2005). Bilingualism, language proficiency, and learning to read in two writing systems. *Journal of Educational Research, 97*, 580–590.

Bindman, M. (2004). Grammatical awareness across languages and the role of social context: Evidence from English and Hebrew. In T. Nunes, & P. Bryant (Eds.). *Handbook of children's literacy*. Great Britain: Kluwer Academic Publishers.

Bruck, M., & Genesee, F. (1995). Phonological awareness in young second language learners. *Journal of Child Language, 22*, 307–324.

Carlisle, J. F. (2000). Awareness of the structure and meaning of morphologically complex words: Impact on reading. *Reading and Writing: An Interdisciplinary Journal, 12*, 169–190.

Carlisle, J. F., & Beeman, M. M. (2000). The effects of language of instruction on the reading and writing achievement of first-grade Hispanic children. *Scientific Studies of Reading, 4*, 331–353.

Carlisle, J. F., Beeman, M., Hull Davis, L., & Spharim, G. (1999). Relationship of metalinguistic capabilities and reading achievement for children who are becoming bilingual. *Applied Psycholinguistics, 20*(4), 459–478.

Chall, J. (1983). *Stages of reading development.* New York: McGraw Hill.

Chen, X., Anderson, R. C., Li, W., Hao, M., Wu, X., & Shu, H. (2004). Phonological awareness of bilingual and monolingual Chinese children. *Journal of Educational Psychology, 96*, 142–151.

Chen, X., Ramírez, G., Luo, Y. C., Geva, E., & Ku, Y.-M. (2012). Comparing vocabulary development in Spanish and Chinese-speaking ELLs: The effects of metalinguistic and sociocultural factors. *Reading and Writing: An Interdisciplinary Journal, 25*, 1991–2020. http://dx.doi.org/10.1007/s11145-011-9318-7.

Chen, X., Xu, F., Nguyen, T.-K., Hong, G., & Wang, Y. (2010). Effects of cross-language transfer on first-language phonological awareness and literacy skills in Chinese children receiving English instruction. *Journal of Educational Psychology, 102*(3), 712–728. http://dx.doi.org/10.1037/a0018802.

Cheung, H., Chung, K. K. H., Wong, S. W. L., McBride-Chang, C., Penney, T. B., & Ho, C. S. H. (2010). Speech perception, metalinguistic awareness, reading, and vocabulary in Chinese-English bilingual children. *Journal of Educational Psychology, 102*(2), 367–380.

Chung, S. C. (2014). *The concurrent and longitudinal relationships between orthographic processing and spelling in French immersion children*(Unpublished Master's dissertation). Toronto, ON: University of Toronto.

Chung, S. C., Chen, X., & Deacon, S. H. (2017). The relationship between orthographic processing and spelling in Grade 1 French immersion children. *Journal of Research in Reading*. http://dx.doi.org/10.1111/1467-9817.12104.

Cirino, P. T., Vaughn, S., Linan-Thompson, S., Cardenas-Hagan, E., Fletcher, J. M., & Francis, D. J. (2009). One-year follow-up outcomes of Spanish and English interventions for English language learners at risk for reading problems. *American Educational Research Journal, 46*, 744–781.

Cisero, C. A., & Royer, J. M. (1995). The development of cross-language transfer of phonological awareness. *Contemporary Educational Psychology, 20*, 275–303.

Comeau, L., Cormier, P., Grandmaison, É., & Lacroix, D. (1999). A longitudinal study of phonological processing skills in children learning to read in a second language. *Journal of Educational Psychology, 91*, 29–43.

Commissaire, E., Duncan, L. G., & Casalis, S. (2011). Cross-language transfer of orthographic processing skills: A study of French children who learn english at school. *Journal of Research in Reading, 34*, 59–76. http://dx.doi.org/10.1111/j.1467-9817.2010.01473.x.

Commissaire, E., Pasquarella, A., Chen, X., & Deacon, S. H. (2014). The development of orthographic processing skills in children in early French immersion programs. *Written Language & Literacy, 17*(1), 16–39. http://dx.doi.org/10.1075/wll.17.1.02com.

Cummins, J. (1979). Linguistic interdependence and the educational development of bilingual children. *Review of Educational Research, 49*, 222–251.

Cummins, J. (1981). The role of primary language development in promoting educational success for language minority students. In California State Department of Education (Ed.). *Schooling and language minority students: A theoretical framework* (pp. 3–49). Los Angeles, CA: National Dissemination and Assessment Center.

Cummins, J. (2012). The intersection of cognitive and sociocultural factors in the development of reading comprehension among immigrant students. *Reading and*

Writing: An Interdisciplinary Journal, 25, 1973–1990.
Cunningham, A. E. (2006). Accounting for children's orthographic learning while reading text: Do children self-teach? *Journal of Experimental Child Psychology, 95*, 56–77. http://dx.doi.org/10.1016/j.jecp.2006.03.008.
Cunningham, T. H., & Graham, C. R. (2000). Increasing native English vocabulary recognition through Spanish immersion: Cognate transfer from foreign to first language. *Journal of Educational Psychology, 92*(1), 37–49.
Deacon, S. H., Benere, J., & Castles, A. (2012). Chicken or egg? Untangling the relationship between orthographic processing skill and reading accuracy. *Cognition, 122*, 110–117. http://dx.doi.org/10.1016/j.cognition.2011.09.003.
Deacon, S. H., Chen, X., Luo, Y. C., & Ramírez, G. (2013a). Beyond language borders: Orthographic processing and word reading in Spanish-English bilinguals. *Journal of Research in Reading, 36*(1), 58–74. http://dx.doi.org/10.1111/j.1467-9817.2011.01490.x.
Deacon, S. H., Commissaire, E., Chen, X., & Pasquarella, A. (2013b). Learning about print: The development of orthographic processing and its relationship to word reading in first grade children in French immersion. *Reading and Writing: An Interdisciplinary Journal, 26*(7), 1087–1109. http://dx.doi.org/10.1007/s11145-012-9407-2.
Deacon, S. H., Wade-Woolley, L., & Kirby, J. R. (2007). Cross-over: The role of morphological awareness in French immersion children's reading. *Developmental Psychology, 43*, 732–746. http://dx.doi.org/10.1037/0012–1649.43.3.732.
Deacon, S. H., Wade-Woolley, L., & Kirby, J. R. (2009). Flexibility in young second-language learners: Examining the language specificity of orthographic processing. *Journal of Research in Reading, 32*(2), 215–229. http://dx.doi.org/10.1111/j.1467-9817.2009.01392.x.
Dressler, C., Carlo, M. S., Snow, C. E., August, D., & White, C. E. (2011). Spanish-speaking students' use of cognate knowledge to infer the meaning of English words. *Bilingualism: Language and Cognition, 14*(2), 243–255. http://dx.doi.org/10.1017/S1366728910000519.
Droop, M., & Verhoeven, L. (2003). Language proficiency and reading ability in first- and second-language learners. *Reading Research Quarterly, 38*, 78–103.
Durgunoğlu, A. Y. (2002). Cross-linguistic transfer in literacy development and implications for language learners. *Annals of Dyslexia, 52*, 189–204.
Durgunoğlu, A. Y., Nagy, W. E., & Hancin-Bhatt, B. J. (1993). Cross-language transfer of phonological awareness. *Journal of Educational Psychology, 85*, 453–465.
Farnia, F., & Geva, E. (2011). Cognitive correlates of vocabulary growth in English language learners. *Applied Psycholinguistics, 32*, 711–738. http://dx.doi.org/10.1017/S0142716411000038.
Farnia, F., & Geva, E. (2013). Growth and predictors of change in english language learners' reading comprehension. *Journal of Research in Reading, 36*(4), 389–421. http://dx.doi.org/10.1111/jrir.12003 ISSN 0141–0423.
Figueredo, L. (2006). Using the known to chart the unknown: A review of first-language influence on the development of english-as-a-second-language spelling skill. *Reading and Writing: An Interdisciplinary Journal, 19*, 873–905. http://dx.doi.org/10.1007/s11145-006-9014-1.
Genesee, F. (1978). A longitudinal evaluation of an early immersion program. *Canadian Journal of Education, 3*, 31–50.
Genesee, F., & Geva, E. (2006). Cross-linguistic relationships in working memory, phonological processes, and oral language. In D. August, & T. Shanahan (Eds.). *Report of the national literacy Panel on K-12 youth and adolescents* (pp. 169–177). Lawrence Erlbaum.
Genesee, F., Geva, E., Dressler, C., & Kamil, M. (2006). Synthesis: Cross-Linguistic Relationships in working memory, phonological processes, and oral language. In D. August, & T. Shanahan (Eds.). *Developing literacy in second-language learners: A report of the national literacy Panel on language-minority children and youth* (pp. 153–174). Mahwah, NJ: Erlbaum.
Geva, E. (2006). Learning to read in a second language: Research, implications, and recommendations for services. In R. E. Tremblay, R. G. Barr, & R. Dev Peters (Eds.). *Encyclopedia on early childhood development* (pp. 1–12). Montreal, Quebec: Centre of Excellence for Early Childhood Development. Retrieved 15 December 2015 from http://www.child-encyclopedia.com/Pages/PDF/GevaANGxp.pdf.
Geva, E., & Clifton, S. (1994). The development of first and second language reading skills in early French Immersion. *The Canadian Modern Language Review, 50*(4), 646–667.
Geva, E., & Genesee, F. (2006). First-language oral proficiency and second-language literacy. In D. August, & T. Shanahan (Eds.). *Report of the national literacy Panel on K-12 youth and adolescents*. Lawrence Erlbaum.
Geva, E., & Ryan, E. B. (1993). Linguistic and cognitive correlates of academic skills in first and second language. *Language Learning, 43*, 5–42.
Geva, E., & Siegel, L. S. (2000). Orthographic and cognitive factors in the concurrent development of basic reading skills in two languages. *Reading and Writing: An Interdisciplinary Journal, 12*, 1–30.
Geva, E., Wade-Woolley, L., & Shany, M. (1997). Development of reading efficiency in first and second language. *Scientific Studies of Reading, 1*, 119–144.
Gottardo, A., Chiappe, P., Yan, B., Siegel, L. S., & Gu, Y. (2006). Relationships between first and second language phonological processing skills and reading in Chinese-English speakers living in English-speaking contexts. *Educational Psychology, 26*, 367–394.
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.
Grabe, W. (2009). *Reading in a second language: Moving from theory to practice*. New York: Cambridge University Press.
Haigh, C. A., Savage, R., Erdos, C., & Genesee, F. (2011). The role of phoneme and onset-rime awareness in second language reading acquisition. *Journal of Research in Reading, 34*(1), 94–113. http://dx.doi.org/10.1111/j.1467-9817.2010.01475.x.
Hancin-Bhatt, B., & Nagy, W. (1994). Lexical transfer and second language morphological development. *Applied Psycholinguistics, 15*, 289–310.
Hipfner-Boucher, K., & Chen, X. (2015). Cross-language transfer of metalinguistic and cognitive skills in second language learning. In X. Chen, V. Dronjic, & R. Helms-Park (Eds.). *Learning to read in a second language: Cognitive and psycholinguistic issues*. New York: Routledge.
Hipfner-Boucher, K., Chen, X., Pasquarella, A., & Deacon, S. H. (April, 2014). The contribution of cognate awareness to French reading comprehension in French immersion children. *Paper presented at the american educational research association annual meeting, Philadephia, P.A*.
Ibrahim, M. H. (1978). Patterns in spelling errors. *English Language Teaching Journal, 32*, 207–212.
Jared, D., Cormier, P., Levy, B. A., & Wade-Woolley, L. (2013). Discrimination of English and French orthographic patterns by biliterate children. *Journal of Experimental Child Psychology, 114*, 469–488. http://dx.doi.org/10.1016/j.jecp.2012.11.001.
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*(1), 90–112.
de Jong, E. J. (2004). After exit: Academic achievement patterns of former English language learners. *Education Policy Analysis Archives, 12*(50), 1–20.
Joy, R. (2011). The concurrent development of spelling skills in two languages. *International Electronic Journal of Elementary Education, 3*(2), 105–121.
Kahn-Horwitz, J., Kuash, S., Ibrahim, R., & Schwartz, M. (2014). How do previously acquired languages effect acquisition of English as a foreign language: The case of Circassian. *Written Language & Literacy, 17*, 40–61.
Keung, Y.-C., & Ho, C. S.-H. (2009). Transfer of reading-related cognitive skills in learning to read Chinese (L1) and English (L2) among Chinese elementary school children. *Contemporary Educational Psychology, 34*(2), 103–112.
Koda, K. (2008). Impacts of prior literacy experience on second-language learning to read. In K. Koda, & A. M. Zehler (Eds.). *Learning to read across languages: Cross-linguistic relationships in first- and second-language literacy development* (pp. 68–96). Mahwah, NJ: Routledge.
Kong, A. (2006). Connections between L1 and L2 readings: Reading strategies used by four Chinese adult readers. *The Reading Matrix, 6*(2), 19–45.
König, E., & Gast, V. (2008). *Understanding English-German contrasts* (2nd ed. (revised)). Berlin: Erich Schmidt.
Kuo, L.-J., & Anderson, R. C. (2006). Morphological awareness and learning to read: A cross- language perspective. *Educational Psychologist, 41*(3), 161–180. http://dx.doi.org/10.1207/s15326985ep4103_3.
Kuo, L.-J., & Anderson, R. C. (2010). Beyond cross-language transfer: Reconceptualizing the impact of early bilingualism on phonological awareness. *Scientific Studies of Reading, 14*(3), 35–385.
Lado, R. (1957). *Linguistics across cultures: Applied linguistics for language teachers.* Ann Arbor: University of Michigan Press.
Lado, R. (1964). *Language teaching: A scientific approach.* New York: McGraw-Hill.
Lafrance, A., & Gottardo, A. (2005). A longitudinal study of phonological processing skills and reading in bilingual children. *Applied Psycholinguistics, 26*, 559–578. http://dx.doi.org/10.1017/S0142716405050307.

Lambert, W. E., & Tucker, G. R. (1972). *Bilingual education of children: The St. Lambert experiment.* Rowley, MA: Newbury House.
Lapkin, S., Hart, D., & Turnbull, M. (2003). Grade 6 French immersion students' performance on large-scale reading, writing, and mathematics tests: Building explanations. *Alberta Journal of Educational Research, 49*, 6–23.
Lesaux, N. K., Crosson, A. C., Kieffer, M. J., & Pierce, M. (2010). Uneven profiles: Language minority learners' word reading, vocabulary, and reading comprehension skills. *Journal of Applied Developmental Psychology, 31*, 475–483. http://dx.doi.org/10.1016/j.appdev.2010.09.004.
Li, T., McBride-Chang, C., Wong, A. M.-Y., & Shu, H. (2012). Longitudinal predictors of spelling and reading comprehension in Chinese as an L1 and English as an L2 in Hong Kong Chinese children. *Journal of Educational Psychology, 104*(2), 286–301.
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. http://dx.doi.org/10.1037/0022-0663.95.3.482.
Malabonga, V., Kenyon, D. M., Carlo, M. S., August, D., & Louguit, M. (2008). Development of a cognate awareness measure for Spanish-speaking English language learners. *Language Testing, 25*(4), 495–519.
Manis, F. R., Lindsey, K. A., & Bailey, C. E. (2004). Development of reading in grades K-2 in Spanish speaking English-language learners. *Learning Disabilities Research & Practice, 19*, 214–224. http://dx.doi.org/10.1111/j.1540-5826.2004.00107.x.
McNeil, L. (2011). Investigating the contributions of background knowledge and reading comprehension strategies to L2 reading comprehension: An exploratory study. *Reading and Writing, 24*, 883–902.
Miller, J. F., Heilmann, J., Nockerts, A., Iglesias, A., Fabiano, L., & Francis, D. J. (2006). Oral language and reading in bilingual children. *Learning Disabilities Research & Practice, 21*, 30–43. http://dx.doi.org/10.1111/j.1540-5826.2006.00205.x.
Morris, L. (2001). Going through a bad spell: What the spelling errors of young ESL learners reveal about their grammatical knowledge. *The Canadian Modern Language Review, 58*, 273–286.
Nagy, W. E., García, G. E., Durgunoğlu, A. Y., & Hancin-Bhatt, B. (1993). Spanish-English bilingual students' use of cognates in English reading. *Journal of Reading Behavior, 25*, 241–259.
Nakamoto, J., Lindsey, K. A., & Manis, F. R. (2008). A cross-linguistic investigation of English language learners' reading comprehension in English and Spanish. *Scientific Studies of Reading, 12*, 351–371. http://dx.doi.org/10.1080/10888430802378526.
National Reading Panel (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction.* Washington DC: National Institute of Child Health and Human Development.
O'Malley, J. M., & Chamot, A. U. (1990). *Learning strategies in second language acquisition.* Cambridge: Cambridge University Press.
Oakhill, J., Hartt, J., & Samols, D. (2005). Levels of comprehension monitoring and working memory in good and poor comprehenders. *Reading and Writing: An Interdisciplinary Journal, 18*, 657–686. http://dx.doi.org/10.1007/s11145-005-3355-z.
Ordóñez, C. L., Carlo, M. S., Snow, C. E., & McLaughlin, B. (2002). Depth and breadth of vocabulary in two languages: Which vocabulary skills transfer? *Journal of Educational Psychology, 94*(4), 719–728. http://dx.doi.org/10.1037/0022-0663.94.4.719.
Pacton, S., & Deacon, S. H. (2008). The timing and mechanisms of children's use of morphological information in spelling: A review of evidence from French and English. *Cognitive Development, 23*, 339–359.
Palincsar, A. S., & Brown, A. L. (1984). Reciprocal teaching of comprehension-fostering and comprehension-monitoring activities. *Cognition and Instruction, 2*, 117–175.
Paradis, J., Genesee, F., & Crago, M. (2011). *Dual language development & disorders: A handbook on bilingualism & second language learning* (2nd ed.). Baltimore: Paul H. Brooks.
Pasquarella, A. (2014). *Reading comprehension in Spanish-English and Chinese-English bilinguals*Unpublished doctoral dissertation. Toronto, ON: University of Toronto.
Pasquarella, A., Chen, X., Lam, K., Luo, Y., & Ramírez, G. (2011). Cross-language transfer of morphological awareness in Chinese-English bilinguals. *Journal of Research in Reading, 34*, 23–42.
Pasquarella, A., Deacon, H., Chen, X., Commissaire, & Au-Yeung, K. (2014). Acquiring orthographic processing through word reading: Evidence from children learning to read French and English. *International Journal of Disability, Development and Education, 61*(3), 240–257. http://dx.doi.org/10.1080/1034912X.2014.932579.
Proctor, C. P., August, D., Carlo, M. S., & Snow, C. E. (2005). Native Spanish-speaking children reading in English: Toward a model of comprehension. *Journal of Educational Psychology, 97*, 246–256. http://dx.doi.org/10.1037/0022-0663.97.2.246.
Proctor, C. P., Carlo, M., August, D., & Snow, C. (2006). The intriguing role of Spanish language vocabulary knowledge in predicting English reading comprehension. *Journal of Educational Psychology, 98*, 159–169. http://dx.doi.org/10.1037/0022-0663.98.1.159.
Proctor, C. P., & Mo, E. (2009). The relationship between cognate awareness and English comprehension among Spanish-English bilingual fourth grade students. *TESOL Quarterly, 43*(1), 126–136.
Ramírez, G., Chen, X., Geva, E., & Kiefer, H. (2010). Morphological awareness in Spanish- English bilingual children: Within and cross-language effects on word reading. *Reading and Writing: An Interdisciplinary Journal, 23*, 337–358. http://dx.doi.org/10.1007/s11145-009-9203-9.
Ramírez, G., Chen, X., Geva, E., & Luo, Y. (2011). Morphological awareness and vocabulary in ELLs. *Applied Psycholinguistics, 32*, 601–618.
Ramírez, G., Chen, X., & Pasquarella, A. (2013). Cross-linguistic Transfer of morphological awareness in Spanish-speaking ELLs: The facilitating effect of cognate knowledge. *Topics in Language Disorders, 33*(1), 73–92.
Rapp, D. N., van den Broek, P., McMaster, K. L., Kendeou, P., & Espin, C. A. (2007). Higher- order comprehension processes in struggling readers: A perspective for research and intervention. *Scientific Studies of Reading, 11*(4), 289–312.
Robertson, D. (2000). Variability in the use of the English article system by Chinese learners of English. *Second Language Research, 16*, 135–172. http://dx.doi.org/10.1191/026765800672262975.
Rolla San Francisco, A., Carlo, M., August, D., & Snow, C. (2006a). The role of language of instruction and vocabulary on the English phonological awareness of Spanish-English bilingual children. *Applied Psycholinguistics, 27*, 229–246. http://dx.doi.org/10.1017/S0142716406060267.
Rolla San Francisco, A., Mo, E., Carlo, M., August, D., & Snow, C. (2006b). The influences of language of literacy instruction and vocabulary on the spelling of Spanish-English bilinguals. *Reading and Writing: An Interdisciplinary Journal, 19*, 627–642. http://dx.doi.org/10.1007/s11145-006-9012-3.
Roman, A. A., Kirby, J. R., Parrila, R. K., Wade-Woolley, L., & Deacon, S. H. (2009). Toward a comprehensive view of the skills involved in word reading in grades 4, 6, and 8. *Journal of Experimental Child Psychology, 102*, 96–113. http://dx.doi.org/10.1016/j.jecp.2008.01.004.
Royer, J. M., & Carlo, M. S. (1991). Transfer of comprehension skills from native to second language. *Journal of Reading, 3*, 450–455.
Saiegh-Haddad, E., & Geva, E. (2008). Morphological awareness, phonological awareness, and reading in English-Arabic bilingual children. *Reading and Writing: An Interdisciplinary Journal, 21*(5), 481–504.
Schiff, R., & Calif, S. (2007). Role of phonological and morphological awareness in L2 oral word reading. *Language Learning, 57*, 271–298.
Schwartz, M., Geva, E., Share, D. L., & Leikin, M. (2007). Learning to read in english as third language: The cross-linguistic transfer of phonological processing skills. *Written Language & Literacy, 10*(1), 25–52.
Schwartz, M., Share, D. L., Leikin, M., & Kozminsky, E. (2008). On the benefits of bi-literacy: Just a head start in reading or specific orthographic insights? *Reading and Writing: An Interdisciplinary Journal, 21*, 905–927. http://dx.doi.org/10.1007/s11145-007-9097-3.
Selinker, L. (1972). Interlanguage. *IRAL, 10*(3), 209–231.
Shany, M., Geva, E., & Melech-Feder, L. (2010). Emergent literacy in children of immigrants coming from a primarily oral literacy culture. *Written Language & Literacy, 13*, 24–60.
Share, D. (1999). Phonological recoding and orthographic learning: A direct test of the self- teaching hypothesis. *Journal of Experimental Child Psychology, 72*, 95–129.
Share, D. L. (2008). On the Anglocentricities of current reading research and practice: The perils of over-reliance on an "outlier" orthography. *Psychological Bulletin, 134*, 584–616.
Stanovich, K. E., & West, R. F. (1989). Exposure to print and orthographic processing. *Reading Research Quarterly, 21*, 360–407.
Sun-Alperin, M. K., & Wang, M. (2011). Cross-language transfer of phonological and orthographic processing skills from Spanish L1 to English L2. *Reading and Writing: An Interdisciplinary Journal, 24*, 591–614. http://dx.doi.org/10.1007/s11145-009-9221-7.
Swain, M., & Lapkin, S. (1982). *Evaluating bilingual education: A canadian case study.* Clevedon, Eng: Multilingual Matters.

Treiman, R., & Zukowski, A. (1991). Levels of phonological awareness. In S. Brady, & D. Shankweiler (Eds.). *Phonological processes in literacy: A tribute to Isabelle P. Liberman*. Hillsdale, NJ: Erlbaum.

Tsai, Y.-R., Ernst, C., & Talley, P. C. (2010). L1 and L2 strategy use in reading comprehension of Chinese EFL readers. *Reading Psychology, 31*, 1–29. http://dx.doi.org/10.1080/02702710802412081.

Turnbull, M., Lapkin, S., & Hart, D. (2001). Grade 3 immersion students' performance in literacy and mathematics: Province-wide results from Ontario (1998 –99). *The Canadian Modern Language Review, 58*, 9–26.

Verhoeven, L. T. (1994). Transfer in bilingual development: The linguistic interdependence hypothesis revisited. *Language Learning, 44*, 381–415.

Verhoeven, L. (2000). Components in early second language reading and spelling. *Scientific Studies of Reading, 4*(4), 313–330.

Wade-Woolley, L., & Geva, E. (2000). Processing novel phonemic contrasts in the acquisition of L2 word reading. *Scientific Studies of Reading, 4*, 267–293.

Wagner, R. K., Torgesen, J. K., & Rashotte, C. A. (1994). Development of reading-related phonological processing ability: New evidence of bidirectional causality from a latent variable longitudinal study. *Developmental Psychology, 30*, 73–87.

Wang, M., Cheng, C., & Chen, S.-W. (2006a). Contribution of morphological awareness to Chinese–English biliteracy acquisition. *Journal of Educational Psychology, 98*, 542–553. http://dx.doi.org/10.1037/0022–0663.98.3.542.

Wang, M., & Geva, E. (2003). Spelling acquisition of novel English phonemes in Chinese children. *Reading and Writing: An Interdisciplinary Journal, 16*, 325–348.

Wang, M., Park, Y., & Lee, K. R. (2006b). Korean-English biliteracy acquisition: Cross-language phonological and orthographic transfer. *Journal of Educational Psychology, 98*, 148–158. http://dx.doi.org/10.1037/0022-0663.98.1.148.

Wang, M., Perfetti, C. A., & Liu, Y. (2005). Chinese-English biliteracy acquisition: Cross-language and writing system transfer. *Cognition, 97*, 67–88. http://dx.doi.org/10.1016/j.cognition.2004.10.001.

Wang, M., Yang, C., & Cheng, C. (2009). The contributions of phonology, orthography, and morphology in Chinese-English biliteracy acquisition. *Applied Psycholinguistics, 30*(2), 291–314.

Wise, N., D'Angelo, N., & Chen, X. (2016). A school-based phonological awareness intervention for struggling readers in early French immersion. *Reading and Writing: An Interdisciplinary Journal, 29*(2), 183–205.

Zdorenko, T., & Paradis, J. (2008). The acquisition of articles in child L2 English: Fluctuation, transfer, or both? *Second Language Research, 24*, 227–250.

Zhang, J., Anderson, R. C., Li, H., Dong, Q., Wu, X., & Zhang, Y. (2010). Cross-language transfer of insight into the structure of compound words. *Reading and Writing: An Interdisciplinary Journal, 23*, 311–336.

Zhang, D., Koda, K., & Sun, X. (2014). Morphological awareness in biliteracy acquisition: A study of young Chinese EFL readers. *International Journal of Bilingualism, 18*(6), 570–585.