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Cross-Linguistic Transfer of Morphological Awareness in Spanish-Speaking English Language Learners: The Facilitating Effect of Cognate Knowledge

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Cross-language effects of Spanish derivational awareness on English vocabulary and reading comprehension were studied in Spanish-speaking English Language Learners ($N = 90$) in grades four and seven. The role of cognate vocabulary in cross-language transfer of derivational awareness was also examined. Multivariate path analyses controlling for age, length of time in Canada, nonverbal reasoning, English phonological awareness, and English word reading revealed that Spanish derivational awareness was related to English cognate vocabulary, but not to English noncognate vocabulary. In addition, there was an indirect contribution of Spanish derivational awareness to English reading comprehension via English cognate vocabulary and English morphological awareness. Findings suggest that knowledge of cognates facilitates the transfer of Spanish derivational awareness to English vocabulary and reading comprehension. These findings have theoretical, pedagogical, and clinical implications. **Keywords:** *cognates; cross-language transfer*, *English reading comprehension*, *English Language Learners*, *English vocabulary*, *Spanish morphological awareness.*

THE ULTIMATE GOAL OF READING is to extract meaning from written material. According to the simple view of reading (Gough & Tunmer, 1986; Hoover & Gough, 1990), reading comprehension can be conceptualized as the product of decoding and language comprehension. Research has

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shown that for older children who have mastered basic decoding skills, vocabulary, a key aspect of language comprehension, is strongly associated with reading comprehension (Proctor, Carlo, August, & Snow, 2005; Snow, Burns, & Griffin, 1998; Stahl & Nagy, 2006). Notably, children who are English Language Learners (ELLs) often lag behind their English first language (L1) peers in vocabulary development (August, Carlo, Dressler, & Snow, 2005; August & Shanahan, 2006; Mancilla-Martinez & Lesaux, 2011). As a result, ELLs' ability to comprehend texts is compromised (August et al., 2005; August & Shanahan, 2006; Lesaux & Kieffer, 2010).

Although the simple view of reading provides a useful overarching framework for understanding the broad landscape of reading, it does not present a complete picture (Kirby & Savage, 2008). Researchers have supplemented the simple view with additional factors that are important for reading comprehension, such as reading fluency and reading strategies (e.g., Geva & Farnia, 2012; Joshi & Aaron, 2000; Lesaux, Rupp, & Siegel, 2007). Similarly, in the present study, we adopt a more nuanced componential view of reading (Koda, 2008) that centers on the contributions of morphological awareness to vocabulary and reading comprehension. The present study also is guided by theories of cross-language transfer (e.g., the linguistic interdependence hypothesis by Cummins, 1979, 1996), which posit that literacy skills bilingual children have developed in their first language can transfer to their second language and impact second language reading. The present study focuses on transfer of morphological awareness from Spanish to English in Spanish-speaking ELLs.

A unique strength ELLs have in reading development is that they can transfer morphological awareness developed in their first language to English to enhance vocabulary and reading comprehension (Deacon, Wade-Woolley, & Kirby, 2007; Ramírez, Chen, Geva, & Kiefer, 2010; Wang, Cheng, & Chen, 2006). Building on previous research, the present study examined the cross-language effect of Spanish morphological awareness on English vocabulary and reading comprehension in Spanish-speaking ELLs. In addition, there is preliminary evidence that knowledge of Spanish–English cognates enhances Spanish-speaking ELLs' understanding of English words, especially words that are morphologically complex (Dressler, Carlo, Snow, August, & White, 2011; Hancin-Bhatt & Nagy, 1994). As such, we also explored whether knowledge of cognates would facilitate transfer of morphological awareness from Spanish to English. Given the large number of Spanish-speaking children learning through English in the US and Canada, it is important to understand how their first language skills contribute to English literacy and use this knowledge to develop reliable assessment tools and effective instructional and remediation strategies.

Morphological awareness refers to the ability to reflect upon and manipulate morphemes, the smallest phonological unit that carries meaning, and to use word formation rules to construct and understand morphologically complex words (Kuo & Anderson, 2006). There are three types of morphology across different languages: inflection, compounding, and derivation. Inflection yields different grammatical forms of a word without altering its meaning or part of speech, for example, *book-books*, *play-played*. Compounding refers to the formation of new words by combining two or more words, for example, *cupcake*, *overbook*. The focus of the present study was on derivational morphology, which forms a new word by combining a root word with an affix (prefix or suffix). The root word carries the basic meaning and the affix modifies or adds meaning to the root. For example, *farmer* is composed of two morphemes, the root *farm* and the affix *-er*. Derivational morphology involves relational, syntactic, and distributional aspects (Tyler & Nagy, 1989). The first aspect refers to a common morpheme shared between two or more words (e.g., *heal-health*). The second aspect involves the association of derivational suffixes with specific syntactic categories and by this virtue, their ability to change the syntactic category of words to which they are attached (e.g., -*ness* and *-tion* indicate noun, whereas *-ify* indicates verb). The third aspect refers to restrictions that apply to the combination of affixes. For example, *-ous* can be attached to nouns, but not to verbs. As will be illustrated below, these aspects are important for understanding the meaning of a derived word as well as comprehending the sentence and paragraph the derived word is part of (Kuo & Anderson, 2006; Nagy, 2007).

There are several reasons why derivational awareness is important for vocabulary and reading comprehension in English. First, English has a large number of derived words. It has been estimated that 60% of the new words children encounter in English academic reading materials are morphologically complex (Nagy & Anderson, 1984). A reader who is aware of morphological relations can deduce the meaning of a novel word from its constituent morphemes. For example, the meaning of *treelet* can be extracted from the root *tree* and the suffix *-let*, which also appears in a more frequent word *booklet.* Second, derivational awareness may contribute to vocabulary and reading comprehension through its association with word reading. Recognizing constituent morphemes within a word improves both the accuracy and fluency of decoding (e.g., Saiegh-Haddad & Geva, 2008). Because English is a deep orthography, speech sometimes maps onto print through morphemes, which are larger segments than phonemes (Carlisle, 2000; Kuo & Anderson, 2006; Nagy, Berninger, & Abbott, 2006; Nagy, Berninger, Abbott, Vaughan, & Vermeulen., 2003). For example, it is more efficient to read the word *electromagnetic* as *electro-magnetic* rather than decoding each letter separately. The morphological strategy is especially beneficial when the root of a morphological complex word undergoes a phonological shift due to affixation (e.g., *heal-health*) because the spelling of the root remains unchanged (Carlisle, 2000). Third, derivational awareness contributes to reading comprehension through the syntactic information encoded in derivational suffixes (Scarborough, 1991; Tyler & Nagy, 1990). Nagy (2007, 2011) illustrates this point with the following two sentences: *The observant typist persuaded analysts. The observer typed persuasive analyses.* Although the two sentences have the same words and word order, the messages they convey are dramatically different because morphological changes in suffixes alter the syntactic relationships of the words.

Substantial research has shown that derivational awareness plays an important role for English L1 children in vocabulary growth (Anglin, 1993; Carlisle, 1995, 2000, 2007; Nagy et al., 2003; Singson, Mahony, & Mann, 2000; Wysocki & Jenkins, 1987) and reading comprehension (Carlisle 2000, Deacon & Kirby, 2004; Nagy, et al., 2006; Tong, Deacon, Kirby, Cain, & Parrila, 2011), particularly when children move beyond the early grades. Importantly for our purpose, the association of derivational awareness with vocabulary and reading comprehension also has been observed within English among second language learners (Chen, Ramírez, Luo, Geva, & Ku, 2012; Cheung, Wong, McBride-Chang, Penney, & Ho, 2010; Kieffer, Biancarosa, & Mancilla-Martinez, in press; Kieffer & Lesaux, 2008, 2012; Mochizuki & Aizawa, 2000; Ramírez et al., 2011). For example, Chen et al. (2012) observed a significant contribution of English derivational awareness to English vocabulary knowledge over and above nonverbal ability, age, phonological awareness, and word reading in Spanish-speaking ELLs in upper elementary and middle school. More recently, Kieffer et al. (in press) found a unique contribution of English derivational awareness to both English vocabulary and reading comprehension in Spanish-speaking ELLs in grades six, seven, and eight. These findings point to the importance of derivational awareness in developing vocabulary and reading skills among ELLs.

The present study investigated whether Spanish derivational awareness contributes to English vocabulary and reading comprehension in Spanish-speaking ELLs. There is increasing evidence for cross-language transfer of morphological awareness in bilingual children. That is, morphological awareness developed in one language is related to reading outcomes (word reading, vocabulary, and reading comprehension) in the other language (Deacon et al., 2007; Pasquarella, Chen, Lam, Luo, & Ramírez, 2011; Ramírez et al., 2010; Saiegh-Hadadd & Geva, 2008; Schiff & Calif, 2007; Wang et al., 2006). Transfer of morphological awareness seems to be at least in part conditioned by shared morphological features between children's first language and second language (Koda, 2008). Two studies (Pasquarella et al., 2011; Wang et al., 2006) involving Chinese–English bilinguals showed that English L2 compound awareness, but not English derivational awareness, predicted Chinese L1 vocabulary and reading comprehension. Noun–noun compounds, which were the focus of both studies, tend to be right-headed (e.g., in the word *bookshelf*, the word on the right, *shelf,* is the head and *book* is the modifier) and transparent in meaning in Chinese as well as in English. The similarities explain why compound awareness developed in English transfers to Chinese and enhances Chinese vocabulary development. By contrast, English derivational awareness was not related to Chinese vocabulary because Chinese has very few derived words. Deacon et al. (2007) demonstrated that inflectional awareness measured by a past-tense analogy task transferred between English and French in Canadian children in French immersion programs, where native speakers of English received instruction exclusively in French. Although past tense has different linguistic manifestations in English and French (e.g., the *ed* at the end of *studied* and the auxiliary *a* and the word-final *e´* in *a e´tudie´*), past-tense tasks in both languages demand an appreciation of past and present actions and situations. Taken together, previous research has suggested that shared linguistic features across children's first and second language form the basis for cross-language transfer of morphological awareness.

English and Spanish share many structural similarities in derivational morphology. Just like in English, derivational morphology involves relational, syntactic, and distributional aspects in Spanish. Moreover, suffixes from Latin (e.g., *-al*, *-able*) and Greek (e.g., *-ocrat*, *-ology* for English and *-ología* for Spanish) origins are used across the two languages. On the other hand, Spanish has a wider variety of derivational morphemes than English. An example of a rich suffixation system that occurs in Spanish but not in English is the diminutives *-ito*(*a*), *-illo*(*a*), *-ico*(*a*), *-cito*(*a*), and *-zuelo*(*a*), which can be added to nouns and adjectives to indicate that something is little, for example, *carrito* (*little car*) or as a form of endearment, for example, *amorcito* (*little love*). In addition, inflectional suffixes such as the gender markers *-o* for masculine and *-a* for feminine are concatenated with derivational suffixes, for example, *cocineras* (*cook*), where *cocin-* is the root, *-er* is the agentive suffix, *-a* is the feminine inflectional suffix, and *-s* is the plural inflectional suffix, adding another layer of complexity that does not exist in English.

To our knowledge, Ramírez et al. (2010) conducted the only study that examined the cross-linguistic transfer of derivational awareness among Spanish-speaking ELLs. They found that Spanish derivational awareness was positively associated with English word reading for ELLs in upper elementary and middle school after controlling for grade, nonverbal ability, working memory, English vocabulary, English phonological awareness, and English derivational awareness. Interestingly, Spanish and English derivational awareness accounted for the same amount of variance in English word reading (6% in both cases). This study provides convincing evidence that Spanish derivational awareness is important for English word reading in Spanish-speaking ELLs. Using the same sample as Ramírez et al. (2010), the present study examined whether a positive cross-language association also existed between Spanish derivational awareness and English vocabulary and reading comprehension. To understand the underlying process of such transfer, we explored in the present study whether cognate knowledge would facilitate the cross-linguistic effect of

Spanish derivational awareness on English vocabulary and reading comprehension.

Cognates are words in different languages that are of a common historical origin (Whitley, 2002). Cognates are often similar in pronunciation, spelling, and meaning. For example, the English word *unusual* corresponds to *inusual* in Spanish. Spanish and English share a large number of cognates (Nash, 1997). An interesting feature of Spanish–English cognates is that many low-frequency English words, for example, *rapid*, that appear in scientific and academic texts have Spanish cognates, for example, *rápido*, that are frequently used in daily life (Bravo, Hiebert, & Pearson, 2007; Cunningham & Graham, 2000; Proctor & Mo, 2009). A systematic examination by Bravo et al. (2007) of the high school science materials in the US revealed that 76% of the critical science vocabulary was English–Spanish cognates. Half of the cognates were high-frequency words in Spanish, whereas only less than a quarter of them had high frequency in English. Thus, the ability to recognize cognate relations between English and Spanish words may enable Spanish-speaking ELLs to use lexical knowledge already developed in their first language to acquire academic vocabulary and in turn support reading comprehension in English.

An increasing number of studies have shown that cognate knowledge facilitates English vocabulary development in Spanish-speaking ELLs (e.g., Chen, et al., 2012; Garcia & Nagy, 1993; Nagy, Garcia, Durgunoglu, & Hancin-Bhatt, 1993; Proctor & Mo, 2009). For example, Nagy et al. (1993) showed that for Spanish-speaking ELLs in grades four, five, and six, the ability to identify English words with Spanish cognates whereas reading passages was related to their performance on multiple-choice questions about the meanings of these English words. In addition, knowledge of the Spanish cognates was related to the performance on the multiple-choice questions for children who were adept at identifying cognates, but not for children who recognized few cognates. These findings indicate that cognate awareness mediates the contribution of Spanish lexical knowledge to English vocabulary learning. Chen et al. (2012) compared the performance of English L1 children, Spanish-speaking ELLs, and Chinese-speaking ELLs on English words with and without Spanish cognates. All three groups of children completed the English Peabody Picture Vocabulary Test (PPVT), and their performance on cognate and noncognate items selected from the test was compared. The English L1 children outperformed the Spanish- and Chinese-speaking ELLs on both types of items. Notably, the Spanish-speaking ELLs also scored higher on cognate items than the Chinese-speaking ELLs, whereas the two groups did not differ on noncognate items. This study suggests that the ability to identify cognates effectively reduces the gap between Spanish-speaking ELLs and English L1 children in English vocabulary development.

Only two previous studies have examined the role of cognate recognition in derivational awareness in Spanish-speaking ELLs. Hancin-Bhatt and Nagy (1994) asked Spanish-speaking ELLs in grades four, six, and eight to translate four types of English words into Spanish: English root and derived words with Spanish cognates (e.g., *facile*, *facility*), and English root and derived words without Spanish cognates (e.g., *short*, *shortly*). The results showed that although the children performed similarly on cognate roots and derivatives, they performed much better on noncognate roots than noncognate derivatives. The researchers thus argue that Spanish-speaking ELLs initially learn to analyze the structure of English-derived words through noticing Spanish roots in these words, and they only notice noncognate roots in English-derived words later. In a more recent study, Dressler et al. (2011) observed that Spanish-speaking ELLs children were able to recognize cognate root words in English-derived words when they were asked to infer the meaning of these words in passage reading. Taken together, findings of these two studies suggest that cognate knowledge facilitates Spanish-speaking ELLs' development of derivational awareness.

The present study belongs to a series of studies we have conducted to examine Spanish-speaking ELLs' language and literacy development within English and Spanish and across the two languages (Chen et al., 2012; Ramírez et al., 2010; Ramírez, Chen-Bumgardner, Geva, & Luo, 2011). Every study in this series used data produced by the same large-scale project. In the present study, we evaluated the cross-linguistic contributions of Spanish derivational awareness to English vocabulary and reading comprehension in Spanish-speaking ELLs with a comprehensive structural equation model (SEM).

Specifically, the present study addressed two research questions. First, we investigated the role of cognate recognition in cross-language transfer of derivational awareness asking: Is Spanish derivational awareness related to English vocabulary with and without Spanish cognates? As in Chen et al. (2012), all participants completed the English PPVT vocabulary test. Cognate and noncognate items in the test were identified by the first author and the children's performance on these two types of items was used as a measure of cognate and noncognate vocabulary. Based on the findings of Hancin-Bhatt and Nagy (1994) and Dressler et al. (2011), we expected that Spanish derivational awareness would be more strongly related to English cognate vocabulary than English noncognate vocabulary.

Furthermore, we investigated the contribution of Spanish derivational awareness to English reading comprehension. In this case, the questions were: Does Spanish derivational awareness make a direct contribution to English reading comprehension? Does it also contribute indirectly through English derivational awareness and English cognate/noncognate vocabulary? These direct and indirect relationships were tested in the model. Age, nonverbal reasoning, English phonological awareness, and English word reading were entered as control variables in the model to ensure that any significant relationship observed among derivational awareness, vocabulary, and reading comprehension was not due to shared variance with these variables.

METHOD

Participants

Ninety Spanish-speaking ELLs (39 fourth graders and 51 seventh graders) recruited from 11 schools in a large multicultural Canadian city participated in this study as part of a larger project on bilingual reading development. The mean age of the sample was 11.30 (SD = 1.45) years old. The children were either born in Canada or arrived at least one year prior to the current study. Their time of residence in Canada ranged from one year to 14 years. English was the language of school instruction for all participants. The children were considered ELLs because Spanish was their first language and the primary language they were exposed to at home.[1] Approximately, 75% of the participants used Spanish as the main language to communicate with their parents, and the remaining used mostly English and some Spanish. About a third of the participants attended Spanish heritage language classes offered free of charge at their schools. These classes met for 2.5 hours every week and focused on both oral language and literacy skills. The children came from a variety of Latin American countries, and the average level of parental education was high school.

Measures

The participants received a battery of language and literacy measures. Parallel derivational awareness measures were administered in English and Spanish. All other measures were given in English only.

Derivational awareness and outcome measures

Derivational awareness. This skill was assessed across the receptive and productive dimensions of derivational morphology. *The*

[1]The ELL status of the participants was confirmed by their significantly lower performance on the English PPVT test than aged matched English monolingual speakers who participated in the larger project (MD = 9.26, p < .001).

Morphological Production Test was adapted from Carlisle (2000). This test required children to complete an orally presented, incomplete sentence by adding or taking a suffix of a target word. The Morphological Structure Test was a modified version from Singson et al. (2000). In this test, children were asked to choose among four derived words from the same stem, the one that would best complete a target sentence. Parallel versions of these two English derivational tests were developed in Spanish. For a full description of these four measures see Ramírez, Chen, Geva, & Kiefer (2010).

Vocabulary. Oral vocabulary was assessed with the Peabody Picture Vocabulary Test, Third Edition, Form III A (PPVT-III A; Dunn & Dunn, 1997). This task was administered in a group format. For that purpose, it was modified and shortened into 60 items, and to examine Spanish-speaking ELLs' knowledge of cognates, items were classified into cognates and noncognates. This categorization yielded 35 (58%) cognates and 25 (42%) noncognates. The inter-item reliability was $\alpha = .76$ for cognate items and $\alpha = .70$ for noncognate items. For details on how the modified task was created, please see Chen, Ramírez, Luo, Geva, and Ku (2012).

Reading comprehension. Reading comprehension was assessed with a modified version of the Peabody Individual Achievement Test (Markwardt, 1989). In this test, the child silently read a sentence and selected one of four pictures that best represented the sentence. A shorter version of the original test was created by selecting every other sentence. There were 36 sentences in the abridged version, and its interitem reliability was $\alpha = .71$.

Control measures

Phonological awareness. Phonological awareness was measured using the Elision subtest of the Comprehensive Test of Phonological Processing (CTOPP; Wagner, Torgesen, & Rashotte, 1999). This task was administered following the standard procedures prescribed in the original test.

Word reading. Word reading was assessed with the Letter-Word Identification Subtest from the Woodcock Language Proficiency Battery (Woodcock, 1984). This test also was administered following the standard procedures prescribed in the original test.

Nonverbal reasoning. Nonverbal reasoning was measured with the Raven's Standard Progressive Matrices (Raven, 1958, Raven, Raven, & Court, 2000). This test required the child to complete visual-spatial matrices by choosing from six or eight options. The nonverbal nature of this test minimizes the impact of language skills on performance and thus reduces biases against ELLs. There were five subtests each composed of 12 matrices, for a total of 60 items. Each child was given a booklet with the stimulus plates and a scoring sheet to record the answers. An experimenter explained the test procedure and gave two practice items to the whole group with feedback. After this, each child worked independently under supervision.

Demographic questionnaire. A demographic questionnaire was used to collect information about the children's home language use, time living in Canada or other English-speaking countries, parents' educational levels, etc. The questionnaire was completed in written form by the parents of the participating children. In particular, the variables *Maternal Education* and *Time of Residence in Canada* were used in the data analysis. Parents were asked to indicate their education level on a scale of 1 to 6, where 1 = primary school, 2 = junior high school, 3 = high school, 4 = college, 5 = university degree, and 6 = graduate degree. Exposure to English was measured by the number of months a child had lived in an English-speaking country.

Procedure

Trained research assistants administered measures of language and literacy to children in a quiet room during school hours. Testing occurred in two sessions, a group testing session and an individual test session, each about 60 min in length. Due to the limited amount of time allotted to test each child, shortened versions of many standardized tests had to be used to ensure all constructs could be measured. In the group testing session, children in groups of 15–20 completed measures of nonverbal reasoning, vocabulary, and reading comprehension in English. The real word and nonword derivational awareness tasks also were administered in group format for both Spanish and English. Measures of phonological awareness, word reading, and morphological production in Spanish and English were administered individually. Parents completed the demographic questionnaire when they read and signed their child's consent form.

RESULTS

Description of performance on measures

Descriptive statistics for all variables are available in Table 1. Both raw scores and percentile ranks are provided for unmodified standardized measures (i.e., nonverbal reasoning, phonological awareness, and word reading). The Spanish-speaking ELLs performed around the 50th percentile on nonverbal reasoning and English word reading. The mean percentile rank for English phonological awareness was slightly below average, but still within the normal range. All measures were normally distributed, except for English morphological structure (real words), which displayed a ceiling effect. Reliability ratings (Cronbach's alpha) also are displayed in Table 1. Reliability was equal to or above the typical benchmark of .70 for most measures. Only the nonword subtest of the Spanish morphological structure task had a low reliability at .62.

Intercorrelations among all measures

A table showing zero-order correlations among all variables is available as Supplemental Digital Content (Table A available at http://links.lww.com/TLD/A11). To protect against Type-I error, only correlations significant at the $p < .01$ level and below were considered meaningful. English reading comprehension displayed moderate to strong correlations with all English and Spanish language, cognitive, and reading measures. English reading comprehension was not correlated with mother's education and number of months lived in Canada. English vocabulary knowledge was moderately to strongly correlated with all English and Spanish measures of derivational awareness. Patterns were mostly the same for the cognate and noncognate subcategories, except that noncognate vocabulary displayed weak or no relationships with Spanish derivational awareness. As for measures of derivational awareness, moderate to strong within-language relationships were noted. Across languages, measures of morphological structure displayed moderate to strong relationships, whereas measures of morphological production displayed a weak or no relationship. Mother's education was not correlated with any variables. Number of months lived in Canada was positively correlated with noncognate vocabulary and English morphological production; however, it was negatively correlated with the measures of Spanish derivational awareness.

Factor analysis

Table 2 presented an exploratory factor analysis, which was used to examine if the multiple measures of English and Spanish derivational awareness loaded onto a unitary factor or on multiple factors. The three measures of English derivational awareness (production, morphological structure real and nonwords) and the three measures of Spanish derivational awareness (production, morphological structure real and nonwords) were entered into the factor analysis. We used a Principal Axis Factoring where Eigen values greater than or equal to 1 were extracted. We used Varimax rotation (an orthogonal solution) with Kaiser Normalization and considered factor loadings greater than .50 to be meaningful.

A two-factor model emerged from the data. English and Spanish derivational awareness emerged as two unique factors. Eigen values

Table 1. Descriptive statistics and reliabilities of variables under study

Variable	α	Max.	Mean	*SD*
Age in months	-	171	135.66	17.37
Months in Canada	-	171	103.28	44.10
Mother's education	-	6	3.24	1.22
Nonverbal reasoning	.91	54	36.31	9.21
Nonverbal reasoning PR	-	100	50.58	26.38
English PA	.92	20	13.59	5.13
English PA PR	-	100	42.19	32.11
English word reading	.92	73	56.67	8.49
English word reading PR	-	100	58.18	25.89
English vocabulary	.77	47	34.82	5.48
English cognate vocabulary	.76	31	21.95	4.11
English noncognate vocabulary	.70	22	17.88	2.13
English morphological production	.84	27	17.67	5.00
English morphological structure (real word)	.77	10	8.14	1.88
English morphological structure (nonword)	.70	10	5.80	2.37
Spanish morphological production	.91	26	14.80	6.22
Spanish morphological structure (real word)	.84	10	6.09	2.68
Spanish morphological structure (nonword)	.62	10	5.26	2.32
English reading comprehension	.81	32	22.01	4.31

Notes. PR = percentile rank; PA = phonological awareness; α = Cronbach's alpha.

were 1.30 and 3.29 for the English and Spanish derivational awareness factors, respectively. The two-factor solution explained 76.45% of the variance. Factor loadings ranged from .81 to .91 for the English derivational awareness measures, and from .73 to .85 for the Spanish derivational awareness measures. The English and Spanish derivational awareness factors were moderately correlated ($r = .37, p < .001$). The English and Spanish derivational awareness factors were used in the subsequent structural equation modeling analysis.

Construction and comparisons of structural models

As displayed in Figure 1, a series of four nested SEM models were created to address our research questions. Model 1 acted as our baseline model. Paths in boldface were subsequently added to models 2 through 4. The fit indices of the four models were compared to identify the best-fitting model for the data. English reading comprehension was the outcome for all the models. Age, length of time in Canada, nonverbal reasoning, and phonological awareness were entered as control variables in all the models. Error variances for cognate and noncognate vocabulary were allowed to correlate, in all models. To simplify our theoretical models outlined in Figure 1, the control variables are not shown.

Model 1, the baseline model, modeled mostly within English relationships. English reading comprehension was predicted by English word reading, English cognate and noncognate vocabulary, and English derivational awareness in this model. The only cross-language relationship in Model 1 was from Spanish derivational awareness to English word reading, which has been demonstrated to be significant in one of our previous studies based on the same large-scale project (Ramírez et al., 2010). Model 2 examined whether Spanish derivational awareness directly contributed to English reading comprehension. A direct path from Spanish derivational awareness to English reading comprehension was added in this model. As we will

Table 2. Factor loadings for common factor analysis (principal component analysis) of English and Spanish morphological awareness

	Derivational Awareness	
Measures	**Spanish**	**English**
English morphological production	0.051	**0.848**
English morphological structure real word	0.193	**0.837**
English morphological structure nonword	0.337	**0.725**
Spanish morphological production	**0.905**	0.058
Spanish morphological structure real word	**0.918**	0.216
Spanish morphological structure nonword	**0.811**	0.344
Eigenvalue	3.29	1.30
Variance explained	54.83	21.62

Note. Extraction method = Principal Component Analysis with Eigenvalues ≥ 1; Factor loadings > .5 are presented boldface type; Rotation method = Varimax with Kaiser normalization.

explain in detail later, this relationship was not significant.

Model 3 examined whether Spanish derivational awareness contributed to English cognate and noncognate vocabulary. Because the direct contribution from Spanish derivational awareness to English reading comprehension was not significant in Model 2, we also examined indirect contributions through English cognate and noncognate vocabulary in Model 3. Finally, a path from Spanish derivational awareness to English derivational awareness was added in Model 4. This model tested whether the relationship between Spanish derivational awareness and English reading comprehension was partially mediated through both English derivational awareness and English cognate and noncognate vocabulary.

The structural models were created and assessed with AMOS 20.0 and parameters were estimated using the maximum-likelihood fitting function. Bootstrapping was used to test for indirect effects. All scores were mean centered before analysis to increase interpretability when comparing parameter values. Model fit was assessed with multiple fit indices, including the chi-square test, the root mean square error of approximation (RMSEA), and comparative fit index (CFI). A χ^2 to *df* ratio <2 and a CFI $>$ .95 suggest good fit. RMSEA values $\leq$.05 suggest good fit, $<$.08 reflect satisfactory fit, and $\geq$.10 suggest poor fit. Deviance statistics were calculated to identify which of the models fit significantly better than the nested comparisons. Deviance statistics are calculated by taking the difference of the χ^2, Akaike Information Criterion (AIC), and Browne-Cudeck criterion (BCC) values between comparison models. If deviance statistics were significant, the model with the lower values (i.e., χ^2, AIC, and BCC) was the better fitting model (Browne & Cudeck, 1993; Kenny, Kashy, & Cook, 2006; Kline, 2011; Raftery, 1995).

Table 3 displays model fits and deviance statistics for the four nested models. Model 2 did not fit significantly better than Model 1, demonstrating that the direct effect of Spanish derivational awareness on English reading comprehension did not improve model fit. However, Model 3 fits significantly better than Model 2, and furthermore, Model 4 fits significantly better than Model 3. Model 4, which included paths from Spanish derivational awareness to English derivational awareness and from Spanish derivational awareness to English cognate and noncognate vocabulary, emerged as the best-fitting model. A power calculation for a small difference between model fit indices, based on the methods outlined by MacCallum, Browne, and Cai (2006), revealed adequate power (.83) for the comparison of Models 3 and 4.

Table 3. Comparison of model fit indices

Model	χ^2	*df*	χ^2/df	AIC	BCC	RMSEA	CFI	$\Delta\chi^2$	ΔAIC	ΔBCC	Δdf
1. Baseline	40.65***	15	2.71	140.64	153.59	0.13	0.93				
2. Direct effect of Spanish DA on comprehension	40.61***	14	2.90	142.61	155.81	0.14	0.93				
Model 1 vs. 2								.04	−1.97	−2.22	1
3. Indirect effect of Spanish DA on comprehension through English vocabulary	30.05*	12	2.50	136.05	149.77	0.13	0.95				
Model 2 vs. Model 3								10.56***	6.56**	6.04*	1
4. Indirect effect of Spanish MA on comprehension through English DA & vocabulary	15.45	11	1.40	123.43	137.40	0.06	0.99				
Model 3 vs. 4								14.60***	12.62***	12.37***	1

Notes. AIC = Akaike Information Criterion; BCC = Browne-Cudeck criterion; RMSEA = root mean square error of approximation; CFI = comparative fit index; DA = derivational awareness. *$p < .05$; **$p < .01$; ***$p < .001$.

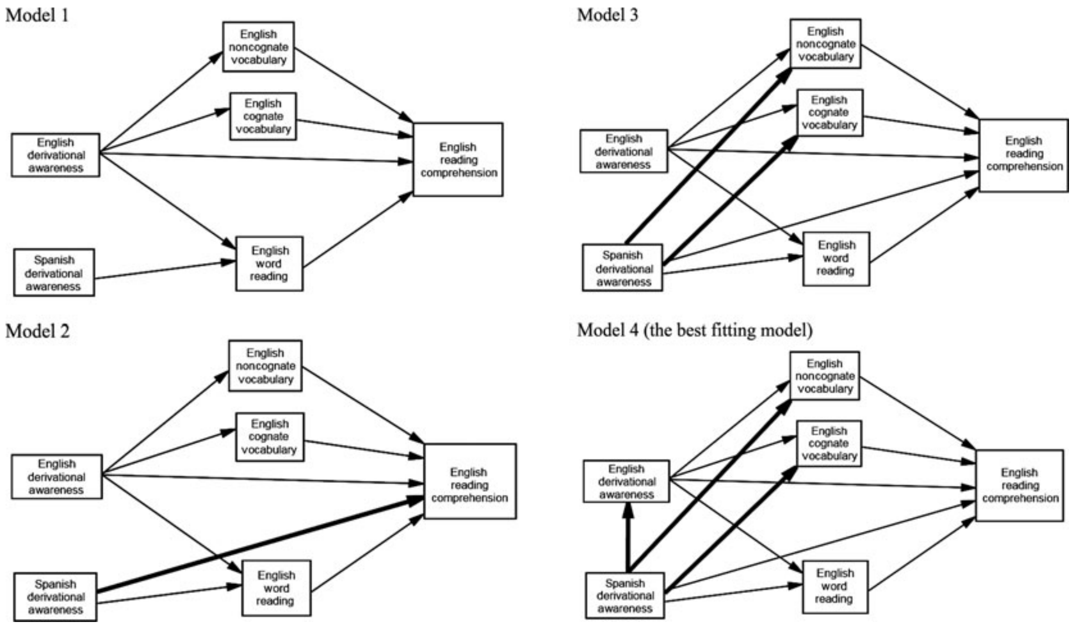

Figure 1. Comparison of theoretical models.

Interpretation of preferred structural model

Figure 2 displays the standardized coefficients for the significant paths in Model 4, the preferred model. Nonsignificant paths are not shown to increase clarity of the figure. Overall, the model displayed good fit statistics: χ^2 (11) = 15.45, p = .22, χ^2/df = 1.40, RMESA = .06, CFI = .99. Power of the preferred model (Model 4), calculated according to MacCallum et al.'s (2006) methods, was .83 for the RMSEA fit statistic. This suggests good power of the preferred model, with .80 considered to be the minimum value for adequate power.

Table 4 presents the amount of unique variance explained by all direct and indirect predictors of English reading comprehension and their standardized coefficients. English cognate vocabulary, English derivational awareness, English word reading, and nonverbal reasoning directly contributed to English reading comprehension. Interestingly, Spanish derivational awareness had an overall indirect relationship with English reading comprehension (95% Bootstrapping Confidence Interval [BCI] for the unstandardized coefficients: .54; 1.97, p = .001). The relationship between Spanish derivational awareness and English reading comprehension was mediated through both English derivational awareness (95% BCI of indirect effect: .36; 1.75, p = .003) and

Table 4. Direct and indirect relationships between reading comprehension and the independent variables

Reading Comprehension		
Variable	ΔR^2	β
Direct effects		
Age	.00	−.04
Months in Canada	.01	.08
Nonverbal reasoning	.04	.20*
Phonological awareness	.01	.10
Word reading	.05	.24*
Noncognate vocabulary	.00	.05
Cognate vocabulary	.03	.018*
English derivational awareness	.09	.31**
Indirect effects		
Spanish derivational awareness	.10	.33***

*p < .05; **p < .01; ***p < .001.

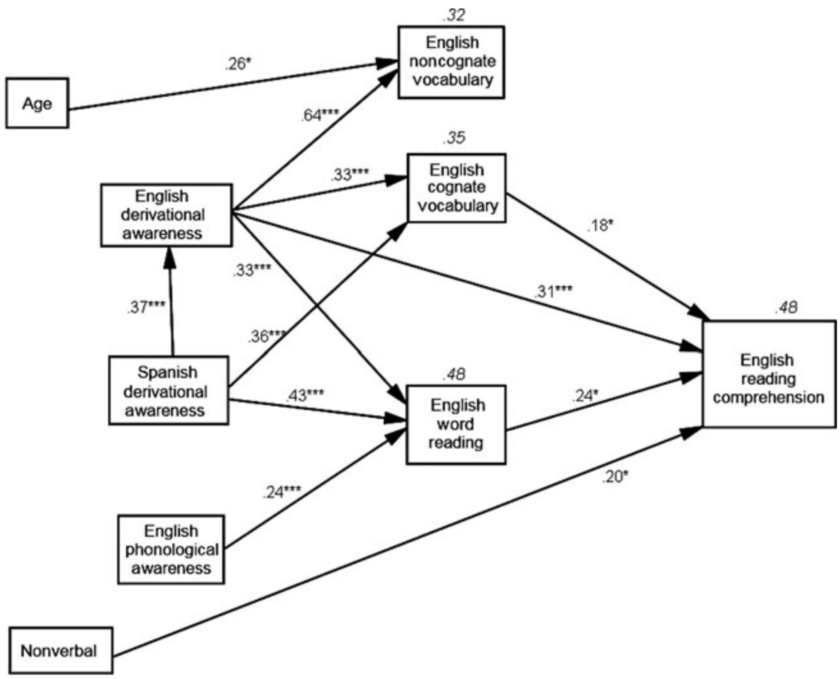

Figure 2. The best fitting structural equation model (Model 4) with significant standardized coefficients and variance explained (in italics).

Table 5. Direct relationships between cognate and noncognate vocabulary and the independent variables

Variable	Cognate Vocabulary ΔR^2	Cognate Vocabulary β	Noncognate Vocabulary ΔR^2	Noncognate Vocabulary β
Age	.02	.13	.07	.26*
Months in Canada	.01	.09	.00	−.06
Nonverbal reasoning	.01	.12	.01	.09
Phonological awareness	.00	−.03	.00	−.05
English derivational awareness	.11	.33***	.41	.64***
Spanish derivational awareness	.13	.36***	.01	−.12

$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

English cognate vocabulary (95% BCI of indirect effect: .03; 1.12, $p = .035$).

Table 5 displays the amount of unique variance explained by all direct predictors of English cognate and noncognate vocabulary and the standardized coefficients for the predictors. English derivational awareness was a unique predictor of both cognate and noncognate vocabulary. However, Spanish derivational awareness was only a unique predictor of English cognate, but not noncognate, vocabulary. Age was related to noncognate vocabulary only. Error variances for cognate and noncognate vocabulary were moderately correlated ($\beta = .37$, $p < .001$). Number of months in Canada was not included in the final model because it was not related to English reading comprehension or English cognate and noncognate vocabulary.

DISCUSSION

In the present study, we investigated whether Spanish derivational awareness transfers to English cognate and noncognate vocabulary and English reading comprehension among Spanish-speaking ELLs. Our results showed that Spanish derivational awareness was related to English cognate vocabulary, but not to English noncognate vocabulary, suggesting that transfer of derivational awareness to vocabulary was conditioned by cognate knowledge. Furthermore, we found that the contribution of Spanish derivational awareness to English reading comprehension was mediated by English derivational awareness and English cognate vocabulary. Overall, these findings provide strong evidence to support the inclusion of morphological awareness as a key skill in a componential model of reading. They also add to the body of research on cross-language transfer of morphological awareness. These findings are discussed further below.

The cross-language effect of Spanish derivational awareness on English vocabulary

An important finding we observed in the present study was that Spanish derivational awareness was associated with English cognate vocabulary, after controlling for age, nonverbal reasoning, English phonological awareness, and English derivational awareness. Previous research has shown that English derivational awareness is a strong predictor of English vocabulary development for ELLs (Kieffer et al., in press; Kieffer & Lesaux, 2008, 2012; Wang et al., 2006, 2009). The finding that Spanish derivational awareness made a unique contribution to English cognate vocabulary over and above the contribution of English derivational awareness suggests that Spanish derivational awareness is also beneficial for English vocabulary development for Spanish-speaking ELLs. In other words, these results suggest that Spanish-speaking ELLs can use morphological skills developed in their first language to facilitate vocabulary development in their second language.

Because Spanish has a more complex derivational system than English, Spanish-speaking ELLs likely develop a heightened sensitivity to morphemes and morphological structures through exposure to Spanish. This sensitivity, in turn, enables them to analyze English words and acquire English vocabulary. Importantly, this cross-linguistic contribution was observed even after controlling for nonverbal ability, which suggests that the transfer effects are not just an artifact of cognitive ability. Ramírez et al. (2010) reported that Spanish derivational awareness contributed to English word reading in Spanish-speaking ELLs. In this follow-up study, we demonstrated that Spanish derivational awareness was also connected with English vocabulary. This finding further strengthens the notion that for second language learners, first language meta-linguistic and literacy skills are important for second language learning (e.g., Koda, 2008).

Notably, Spanish derivational awareness made a unique contribution to English cognate vocabulary, whereas the association between Spanish derivational awareness and English noncognate vocabulary was not significant. These findings indicate that Spanish derivational awareness enhances the learning of English words with Spanish cognates to a greater extent than English words without Spanish cognates. Spanish-speaking ELLs have better knowledge of English words with Spanish cognates (Dressler et al., 2011; Hancin-Bhatt & Nagy, 1994). Thus, a plausible explanation for our findings is that Spanish-speaking ELLs are more capable of extracting the meaning of English-derived words through morphological analysis when root words are known to them. Our findings are consistent with Hancin-Bhatt and Nagy (1994), who demonstrate that when processing English-derived words, Spanish-speaking ELLs recognize roots with Spanish cognates more easily than roots that are unique to

English. We also go beyond this previous study by assessing derivational awareness and cognate vocabulary with two separate measures and observing a significant transfer effect from Spanish derivational awareness to English cognate vocabulary after controlling for other variables that also may contribute to English vocabulary. Our study provides clear evidence that knowledge of cognates facilitates the transfer of Spanish derivational awareness to English vocabulary.

Our findings have important theoretical implications on the nature of cross-language transfer of derivational awareness between Spanish and English. According to Koda (2000), cross-language transfer could occur at two different levels: the skill level and the knowledge level. Previous research has reported that L2 English compound awareness transfers to L1 Chinese vocabulary in Chinese–English bilinguals (Pasquarella et al., 2011). Because Chinese and English do not share any common vocabulary, one can be certain that this transfer occurs at the skill level. That is, bilingual Chinese- and English-speaking children develop an abstract understanding of compound structures from their exposure to English and subsequently apply this understanding to acquire Chinese vocabulary.

On the other hand, the results of the present study suggest that transfer of Spanish derivational awareness to English vocabulary may be primarily driven by shared vocabulary—Children are better able to analyze the structure of an English-derived word when the root is an English–Spanish cognate. Of course, this may not be the only type of transfer that exists between Spanish and English. It is possible that children may still develop a generalized understanding of morphological structures that transcends shared vocabulary. In the present study, this understanding may be partly shown by the correlation between the Spanish and English derivational awareness measures. These two types of transfer in Spanish-speaking ELLs need to be further investigated by future research.

Derivational awareness, cognate vocabulary, and reading comprehension

The present study examined predictors of English reading comprehension in Spanish-speaking ELLs. We found that English derivational awareness, cognate vocabulary, and English word reading contributed directly to individual differences in reading comprehension. Importantly, Spanish derivational awareness was an indirect predictor of English reading comprehension. The relationship between Spanish derivational awareness and English reading comprehension was mediated by both English derivational awareness and cognate vocabulary.

With respect to within-language predictors of English reading comprehension, our study replicated the findings of previous research. We observed that English derivational awareness explained unique variance in English reading comprehension after controlling for nonverbal reasoning, age, English phonological awareness, vocabulary, and word reading. This finding adds to a growing body of research that has identified morphological awareness as a strong and consistent predictor of reading comprehension for ELLs (Kieffer et al., in press; Kieffer & Lesaux, 2008, 2012; Wang et al., 2006, 2009), even after controlling for variables critical for reading comprehension such as vocabulary. Derivational suffixes encode syntactic information, which is critical for sentence and passage comprehension (Nagy, 2007, 2011). In addition, derivational awareness provides insights into meanings of words that children encounter during real-time reading (Kieffer et al., in press). Although a word may not be incorporated into the mental lexicon through this brief encounter, gaining access to its meaning through morphological analysis during real-time reading should be helpful for comprehension.

Aside from English derivational awareness, English cognate vocabulary also predicted English reading comprehension. Interestingly, English noncognate vocabulary was not a significant predictor. English words with Spanish cognates are typically low-frequency academic words (Bravo, et al., 2007; Cunningham & Graham, 2000; Proctor & Mo, 2009), which explains why they are particularly important for English reading comprehension for children in higher elementary grades and middle school. English words without Spanish cognates, on the other hand, tend to be of higher frequency and thereby do not differentiate among children in this age range.

Although Spanish derivational awareness did not make a direct contribution to English reading comprehension, it contributed indirectly through the mediation of English derivational awareness and cognate vocabulary. One possible explanation for the lack of direct contribution is that Spanish derivational awareness shared a large amount of variance with English derivational awareness and cognate vocabulary, both of which were significant predictors of English reading comprehension. Notably, English and Spanish derivational awareness formed two distinct, but related factors in our analysis. The connection between the two constructs is likely based partly on shared morphological structures between Spanish and English and partly on a generalized ability to perform morphological analysis. Thus, for Spanish-speaking ELLs, derivational awareness developed in their first language facilitates English derivational awareness, which in turn supports English reading comprehension. As expected, mediation of Spanish derivational awareness through English vocabulary occurred for cognate vocabulary only. This finding suggests that increased Spanish derivational awareness allows easier access to the meaning of English vocabulary and in turn improves English reading comprehension. Again, we see that cross-language associations are facilitated by structural similarities between Spanish and English. These shared relationships enable Spanish-speaking ELLs to capitalize on their first language skills to assist English reading comprehension.

Conclusions and implications for assessment and instruction

In conclusion, whereas previous studies have demonstrated that English derivational awareness contributes to English vocabulary and English reading comprehension in English L1 students and Spanish-speaking ELLs (Nagy, et al., 2006; Kieffer et al., in press), the present study is the first to include Spanish derivational awareness in the model of English reading comprehension for Spanish-speaking ELLs. Our findings suggest that Spanish derivational awareness plays a key role in Spanish-speaking ELLs English reading development. Not only does Spanish derivational awareness contribute to knowledge of English words that have Spanish cognates, it also enhances English reading comprehension by facilitating English derivational awareness and cognate vocabulary. Our findings also shed light on the nature of cross-language transfer of morphological awareness. It seems that the cross-language effects of Spanish derivational awareness on English vocabulary and reading comprehension are to a large extent mediated through cognate knowledge.

The present study has at least two limitations. A major limitation is that we did not have a separate measure of children's knowledge of cognate words. Children's cognate and noncognate vocabulary were assessed with their respective performance on cognate and noncognate items in English PPVT and these two types of items were not matched on morphological structure or frequency. It may be difficult to match cognate and noncognate words on any dimension because they are inherently different—Cognate words tend to be low-frequency academic words whereas noncognate words tend to be high-frequency words that appear in daily vocabulary. Nevertheless, an experimental measure that carefully considers these factors would provide a better indication of children's knowledge of cognate and noncognate words. Another limitation is that the present study adopted a cross-sectional design. All measures were given at a single time point. As such, the results did not provide information about the directionality of the relationships. For example, whereas it is possible that Spanish derivational awareness facilitates cognate vocabulary, it is equally possible that cognate vocabulary enhances Spanish derivational awareness. In fact, the relationship is likely to be reciprocal rather than one-directional. These possibilities should be investigated by longitudinal studies in the future.

The findings of the present study have important implications on assessment for Spanish-speaking ELLs. In upper elementary grades and beyond, when a large proportion of the academic vocabulary is morphological complex, derivational awareness emerges as an increasingly important predictor of vocabulary and reading comprehension. Consequently, assessing derivational awareness may offer an effective way to identify weaknesses and strengths in children's literacy development. This assessment also may help identify children who experience difficulties with reading comprehension despite having sufficient decoding skills. The present study demonstrates that for Spanish-speaking ELLs, Spanish derivational awareness is related strongly to English derivational awareness and cognate vocabulary, both of which are predictors of English reading comprehension. These findings suggest that Spanish-speaking ELL's derivational awareness can be assessed in either English or Spanish. For recent immigrants who have not mastered English oral proficiency, it may be particularly beneficial to assess derivational awareness in Spanish so that intervention for reading difficulties can be given immediately, if warranted. Moreover, if an English derivational awareness task is used as part of an assessment battery, the validity and reliability of this measure for Spanish-speaking ELLs might be increased if the roots of target words are cognates with Spanish. However, more research is needed before these insights are translated into practice.

Our findings provide guidance on reading instruction for Spanish-speaking ELLs as well. A major challenge faced by ELLs in reading comprehension is low levels of vocabulary knowledge, and helping these learners develop robust vocabulary knowledge is an important goal for teachers. The reading model presented in our study suggests that derivational awareness and cognate knowledge are both closely related to English reading comprehension. Therefore, both morphological and cognate strategies should be incorporated in reading instruction for Spanish-speaking ELLs. In fact, these two strategies seem to be mutually facilitating. On the one hand, derivational awareness enables children to acquire new vocabulary by extracting the meaning of unfamiliar words from their familiar parts. On the other hand, Spanish-speaking ELLs are better able to carry out morphological analysis when the root of a complex word is an English–Spanish cognate. Because not all children are adept at performing morphological analysis or identifying cognates, explicit instruction may be required in these areas.

REFERENCES

Anglin, J. (1993). Vocabulary development: A morphological analysis. *Monographs of the Society for Research in Child Development*, *58*(10), 1–166.

August, D., Carlo, M., Dressler, C., & Snow, C. (2005). The critical role of vocabulary development for English language learners. *Learning Disabilities Research & Practice*, *20*(1), 50–57.

August, D., & Shanahan, T. (2006). Synthesis: Instruction and professional development. In D. August & T. Shanahan, (Eds.), (*Developing literacy in second-language learners: Report of the National Literacy Panel on Language-Minority Children and Youth* (pp. 351–364). Mahwah, NJ: Lawrence Erlbaum Associates.

Bravo, M., Hiebert, E., & Pearson, D. (2007). Tapping the linguistic resources of Spanish-English bilinguals: The role of cognates in science. In R. K. Wagner, A. E. Muse & K. R. Tannenbaum, (Eds.) *Vocabulary acquisition: Implications for reading comprehension* (pp. 140–156). New York: Guildford Press.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. Bollen & S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury Park, NJ: Sage.

Carlisle, J. F. (1995). *Morphological awareness and early reading achievement*. Hillsdale, NJ: Lawrence Erlbaum Associates.

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. (2007). Fostering morphological processing, vocabulary development, and reading comprehension. In R. K. Wagner, A. E. Muse & K. R. Tannenbaum (Eds.), *Vocabulary acquisition: Implications for reading comprehension* (pp. 78–103). New York: Guilford Press.

Chen, X., Ramírez, G., Luo, Y. C., Geva, E., & Ku, Y. (2012). Comparing vocabulary development in Spanish- and Chinese-speaking ELLs: The effects of metalinguistic and sociocultural factors. *Reading and Writing*, *25*(8), 1991–2020.

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

Cummins, J. (1979). Cognitive/academic language proficiency, linguistic interdependence, the optimum age question and some other matters. *Working Papers on Bilingualism*, *19*, 198–203.

Cummins, J. (1996). *Negotiating identities: Education for empowerment in a diverse society*. Los Angeles, CA: California Association for Bilingual Education.

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*, 37–49.

Deacon, S. H., & Kirby, J. R. (2004). Morphological awareness: Just “more phonological”? The roles of morphological and phonological awareness in reading development. *Applied Psycholinguistics*, *25*, 223–238.

Deacon, S. H., Wade-Woolley, L., & Kirby, J. R. (2007). Crossover: The role of morphological awareness in French immersion children’s reading. *Developmental Psychology*, *43*, 732–746.

Dressler, C., Carlo, M., Snow, C., August, D., & White, C. (2011). Spanish-speaking students’ use of cognate knowledge to infer the meaning of English words. *Bilingualism: Language and Cognition*, *14*(2), 243–255.

Dunn, L., & Dunn, L. (1997). *Peabody picture vocabulary test* (3rd ed.). Circle Pines, MN: American Guidance Service.

Garcia, G. E., & Nagy, W. E. (1993). Latino students’ concept of cognates. In D. Leu & C. K. Kinzer (Eds.), *Examining central issues in literacy research, theory, and practice* (pp. 367–374). Chicago: National Reading Conference.

Geva, E., & Farnia, F. (2012). Developmental changes in the nature of language proficiency and reading fluency paint a more complex view of reading comprehension in ELL and EL1. *Reading and Writing*, *25*(8), 1819–1845.

Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education*, *7*, 6–10.

Hancin-Bhatt, B., & Nagy, W. (1994). Lexical transfer and second language morphological development. *Applied Psycholinguistics*, *15*, 289–310.

Hoover, W. A., & Gough, P. B. (1990). The simple view of reading. *Reading and Writing*, *2*, 127–160.

Joshi, R. M., & Aaron, P. G. (2000). The component model of reading: Simple view of reading made a little more complex. *Reading Psychology*, *21*, 85–97.

Kenny, D. A., Kashy, D. A., & Cook, W. L. (2006). *Dyadic data analysis*. New York, NY: Guilford Press.

Kieffer, M., Biancarosa, G., & Mancilla-Martinez, J. (in press). Roles of morphological awareness in the reading comprehension of Spanish-speaking language minority learners: Exploring partial mediation by vocabulary and reading fluency. *Applied Psycholinguistics*, advanced online publication. doi: 10.1017/S0142716411000920

Kieffer, M. J., & Lesaux, N. K. (2008). The role of derivational morphological awareness in the reading comprehension of Spanish-speaking English language learners. *Reading and Writing: An Interdisciplinary Journal*, *21*, 783–804.

Kieffer, M. J., & Lesaux, N. K. (2012). Direct and indirect roles of morphological awareness in the English reading comprehension of native English, Spanish, Filipino, and Vietnamese Speakers. *Language Learning, 62*(4), 1170-1204. doi: 10.1111/j.1467-9922.2012.00722.x

Kirby, J. R., & Savage, R. S. (2008). Can the simple view deal with the complexities of reading? *Literacy*, *42*(2), 75–82.

Kline, R. B. (2011). *Principles and practice of structural equation modeling*. New York, NY: Guilford Press.

Koda, K. (2000). Cross-linguistic variations in L2 morphological awareness. *Applied Psycholinguistics*, *21*, 297–320.

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 development* (pp. 68–96). New York: Taylor & Francis.

Kuo, L., & Anderson, R. C. (2006). Morphological awareness and learning to read: A cross-language perspective. *Educational Psychologist*, *41*, 161–180.

Lesaux, N. K., & Kieffer, M. J. (2010). Exploring sources of reading comprehension difficulties among language minority learners and their classmates in early adolescence. *American Educational Research Journal*, *47*, 596–632.

Lesaux, N. K., Rupp, A. A., & Siegel, L. S. (2007). Growth in reading skills of children from diverse linguistic backgrounds: Findings from a 5-year longitudinal study. *Journal of Educational Psychology*, *99*(4), 821–834.

MacCallum, R. C., Browne, M. W., & Cai, L. (2006). Testing differences between nested covariance structure models: Power analysis and null hypotheses. *Psychological Methods*, *11*, 19–35.

Mancilla-Martinez, J., & Lesaux, N. (2011). The gap between Spanish speakers' word reading and word knowledge: A longitudinal study. *Child Development*, *82*(5), 1544–1560.

Markwardt, F. C. (1989). *Peabody individual achievement test-revised*. Circle Pines, MN: American Guidance Circle.

Mochizuki, M., & Aizawa, K. (2000). An affix acquisition order for EFL learners: An exploratory study. *System*, *28*, 291–304.

Nagy, W. (2007). Metalingusitic awareness and the vocabulary-comprehension connection. In R. K. Wagner, A. Muse & K. Tannenbaum (Eds.), *Vocabulary acquisition and its implications for reading comprehension* (pp. 52–77). New York: Guilford Press.

Nagy, W. (2011). Discussion. In, A. Goodwin (Chair), *Morphology matters: Developing a nuanced view of how, when, and for whom morphological awareness contributes to literacy*. Symposium conducted at the 18th Meeting of the Society for the Scientific Study of Reading, St. Pete, FL.

Nagy, W., & Anderson, R. C. (1984). How many words are there in printed school English? *Reading Research Quarterly*, *19*, 304–330.

Nagy, W., Berninger, V., Abbott, R., Vaughan, K., & Vermeulen, K. (2003). Relationship of morphology and other language skills to literacy skills in at-risk second-grade readers and at-risk fourth-grade writers. *Journal of Educational Psychology*, *95*(4), 730–742.

Nagy, W. E., Berninger, V. W., & Abbott, R. D. (2006) Contributions of morphology beyond phonology to literacy outcomes of upper elementary and middle-school students. *Journal of Educational Psychology*, *98*, 134–147.

Nagy, W. E., Garcia, G. E., Durgunoglu, A. Y., & Hancin-Bhatt, B. (1993). Spanish-English bilingual students' use of cognates in English reading. *Journal of Reading Behavior*, *25*, 241–259.

Nash, R. (1997). *NTC's dictionary of Spanish cognates: Thematically organized*. Lincolnwood, IL: NTC Publishing Group.

Pasquarella, A., Chen, C., Lam, K., Luo, Y. C., & Ramírez, G. (2011). Cross-language transfer of morphological awareness in Chinese-English bilinguals: The effects on word reading, vocabulary, and reading comprehension. *Journal of Research in Reading*, *34*(1), 23–42.

Proctor, C. P., Carlo, M. S., August, D., & Snow, C. (2005). Native Spanish-speaking children reading in English: Toward a model of comprehension. *Journal of Educational Psychology*, *97*(2), 246–256.

Proctor, C. P., & Mo, E. (2009). The relationship between cognate awareness and English comprehension among Spanish-English bilingual fourth grade students. *TESOL Quarterly: A Journal for Teachers of English to Speakers of Other Languages and of Standard English as a Second Dialect*, *43*(1), 126–136.

Raftery, A. (1995). Bayesian model selection in social research. In P. V. Marsden (Ed.), *Sociological methodology* (pp. 1–61). Oxford: Blackwell.

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.

Ramírez, G., Chen-Bumgardner, B., Geva, E., & Luo, Y. (2011). Morphological awareness and vocabulary in ELLs. *Applied Psycholinguistics*, *32*, 601–618.

Ramírez, G., Kuo, L., Baab, K., Li, Y., Kim, T., & Bollinger, P. (2011, July). *The development of morphological and syntactic awareness among young second language learners: A Study of children in Spanish-English Two-Way Immersion Bilingual Program*. Paper presented at the Society for the Scientific Study of Reading Annual Meeting, St. Peterborough, FL.

Raven, J. (1958). *Standard progressive matrices*. London, UK: H.K. Lewis & Co. Ltd.

Raven, J., Raven, J. C., & Court, J. H. (2000). *Manual for Raven's progressive matrices and vocabulary scales. Section 3: The standard progressive matrices*. San Antonio, TX: Harcourt Assessment.

Saiegh-Hadadd, E., & Geva, E. (2008). Morphological awareness, phonological awareness, and reading in English-Arabic bilingual children. *Reading and Writing: An Interdisciplinary Journal*, *21*, 481–504.

Scarborough, H. (1991). Early syntactic development of dyslexic children. *Annals of Dyslexia*, *41*, 207–220.

Schiff, R., & Calif, S. (2007). Role of phonological and morphological awareness in L2 oral word reading. *Language Learning*, *57*, 271–298.

Singson, M., Mahony, D., & Mann, V. (2000). The relation between reading ability and morphological skills: Evidence from derivational suffixes. *Reading and Writing*, *12*, 219–252.

Snow, C. E., Burns, M. S., & Griffin, P. (*1998*). *Preventing reading difficulties in young children*. Washington, DC: National Academy Press.

Stahl, E., & Nagy, W. E. (2006). *Teaching word meanings*. Mahwah, NJ: Lawrence Erlbaum Associates.

Tong, X., Deacon, S. H., Kirby, J. R., Cain, K., & Parrila, R. (2011). Morphological awareness: A key to understanding poor reading comprehension in English. *Journal of Educational Psychology*, *103*(3), 523–534.

Tyler, A., & Nagy, W. (1989). The acquisition of English derivational morphology. *Journal of Memory and Language*, *28*, 649–667.

Tyler, A., & Nagy, W. (1990). Use of derivational morphology during reading. *Cognition*, *36*, 17–34.

Wagner, R. K., Torgesen, J., & Rashotte, C. (1999). *Comprehensive Test of Phonological Processing (CTOPP)*. Austin, TX: Pro-Ed.

Wang, M., Cheng, C., & Chen, S. (2006). Contribution of morphological awareness to Chinese English biliteracy acquisition. *Journal of Educational Psychology*, *98*, 542–553.

Wang, M., Ko, I.Y., & Choi, J. (2009). The importance of morphological awareness in Korean-English biliteracy acquisition. Contemporary Educational Psychology, *34*, 132–142.

Whitley, M. S. (2002). *Spanish/English contrasts: A course in Spanish linguistics* (2nd ed.). Washington, DC: Georgetown University Press.

Wysocki, K., & Jenkins, J. R. (1987). Deriving word meanings through morphological generalization. *Reading Research Quarterly*, *22*, 66–81.

Woodcock, R. W. (1984). *Woodcock language proficiency battery*. Allen, TX: DLM.