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Role of narrative skills on reading comprehension: Spanish-English and Cantonese-English Dual Language Learner

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Abstract

This longitudinal study examined the role of narrative skills in English reading comprehension, after controlling for vocabulary and decoding, with a sample of 112 dual language learners (DLLs), including both Spanish-English and Cantonese-English children. Decoding, vocabulary, and narrative samples were collected in the winter of first grade and reading comprehension skills were assessed on the same children one year later in second grade. Spanish-English DLLs had significantly lower English receptive vocabulary but higher L1 receptive vocabulary than their Cantonese peers. At the same time, Spanish-English DLLs scored lower than Cantonese-English DLLs on English reading comprehension. There were no differences in English reading comprehension between DLL children in bilingual programs and those in mainstream English programs after controlling for L1. Multiple regression results show that English decoding and English vocabulary explain a significant portion of the variance in English reading comprehension. Regression results also revealed a significant, albeit small, effect of narrative quality (both within- and cross-language) on English reading comprehension one year later, after controlling for English decoding and English vocabulary. Implications and directions for future research are discussed.

Keywords

dual language learners; narrative skills; reading comprehension; vocabulary; decoding

Research with emerging bilinguals has found both word reading (e.g., Mancilla-Martinez, Kieffer, Christodoulou, Biancarosa, & Snow, 2011; Uchikoshi 2013) and vocabulary (e.g., Lesaux, Crosson, Kieffer, & Pierce, 2010; Proctor & Louick, 2017; Uchikoshi 2013; Verhoeven, van Leeuwe, & Vermeer, 2011) to be the best predictors of reading comprehension, with more reliance on word reading in the early elementary years (Nakamoto, Lindsey, & Manis, 2007; Ouellette & Beers, 2010). Vocabulary has often been used as a proxy for linguistic comprehension (e.g., Mancilla-Martinez & Lesaux, 2010; Pasquarella, Gottardo, & Grant, 2012). In a recent comprehensive literature review of studies examining the role of vocabulary in reading comprehension among emergent bilingual children, Proctor and Louick (2017) identified 26 studies published after 2000 that examined the role of vocabulary in reading comprehension. Of these, 22 were conducted with children who had English as a second language. A majority of the studies reviewed reported strong

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within-language associations between early vocabulary knowledge and later reading comprehension.

However, relying on receptive or expressive vocabulary—frequently measured in a decontextualized manner through a standardized assessment—as an indicator of oral language can be limiting (Branum-Martin et al., 2009; Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, DHHS, 2010). The National Early Literacy Report (Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, DHHS., 2010) found measures of more complex oral language skills, such as grammar, definitional vocabulary, and listening comprehension, to be stronger predictors of reading comprehension than mere measures of vocabulary. The authors suggest that vocabulary alone is likely not enough to improve language and reading outcomes.

Moreover, researchers have argued that the ability to produce oral language in a communicative context, such as a narrative, should be considered the standard for assessing language knowledge (Braisby & Dockrell, 1999; Dockrell & Messer, 2004; Miller et al., 2006). They have argued that this ability may provide more insights into children's oral proficiency (Fiestas & Peña, 2004; Hipfner-Boucher et al., 2014; Karlsen, Geva, & Lyster, 2016; Miller et al., 2006; Muñoz, Gillam, Peña, & Gulley-Faehnle, 2003). Narrative ability has shown exceptional promise as a precursor to reading for monolingual children (e.g., Dickinson & Tabors, 2001; Griffin, Hemphill, Camp, & Wolf, 2004; Pearson, Hiebert, & Kamil, 2007). Through narrative samples, multiple levels of language use can be evaluated, allowing simultaneous comparisons of words, sentences, and narrative structure within and across languages (Dockrell & Messer, 2004; Karlsen et al., 2016; Miller et al., 2006). However, studies on the oral narrative abilities of bilingual children have not been as prevalent as research on vocabulary (Gutiérrez-Clellen, 2002; Miller et al., 2006; Muñoz et al., 2003; Pearson, 2002; Uccelli & Páez, 2007; Uchikoshi, 2005) and warrant more study.

Majority of the studies conducted with dual language learners (DLLs) have examined children whose first language is Spanish. In order to have a more comprehensive understanding of how bilingual oral proficiency affects English reading comprehension, it is crucial that more research examine bilinguals from different native language backgrounds. Studies with Spanish-English bilinguals focus on bilinguals whose two languages share an alphabet and many cognates. Few studies focus on bilinguals whose two languages do not share a writing system, such as Chinese-English bilinguals (Hammer et al., 2014; National Academy of Sciences, Engineering, and Medicine, 2017). By examining DLLs with various language backgrounds, we can better understand the similarities and differences between DLL groups.

The goal of our longitudinal study was to examine the role of narrative skills on English reading comprehension one year later, after controlling for vocabulary, and decoding skills of Spanish-English and Cantonese-English DLLs in the US, in both their first/home language (L1) and their second language (L2), which was English. Spanish-English and Chinese-English DLLs represent the most- and second-most-frequently spoken home languages among non-English-speaking families in the United States (US Census Bureau, 2015). Moreover, Spanish-English bilinguals learn two alphabetic languages while the

Chinese-English DLLs learn one alphabetic and one non-alphabetic language, allowing us to see potential influences of the home language on bilingual language and literacy development. Specifically, Cantonese-speakers was selected over Mandarin-speakers because Chinese reading instruction in Cantonese, unlike that in Mandarin Chinese, does not include the use of pinyin, an alphabetic writing system designed to help children learn Mandarin in Mainland China, when learning to read Chinese characters. Therefore, focusing on children whose reading exposure to Chinese is not through pinyin would allow us to understand the relationships among vocabulary, decoding, narrative skills, and reading comprehension in DLLs with a non-alphabetic L1, and contrast well to the Spanish-English DLLs whose two languages would be alphabetic.

Reading Comprehension in Monolinguals and Bilinguals

The Simple View of Reading proposes that R = D x C, where R is reading comprehension, D is decoding, and C is linguistic comprehension (Hoover & Gough, 1990; Tunmer & Hoover, 1992). Support for the Simple View of Reading has been found with both monolingual speakers (e.g., Catts et al., 2005; Cutting & Scarborough, 2006; Joshi & Aaron, 2000; Tunmer & Hoover, 1992; Yeung, Ho, Chan, & Chung, 2016) and DLLs (e.g., Hoover & Gough, 1990; Lesaux, Crosson, Kieffer, & Pierce, 2010; Mancilla-Martinez et al., 2011; Manis, Lindsey, & Bailey, 2004; Pasquarella, Gottardo, & Grant, 2012; Proctor, Carlo, August, & Snow, 2005; Uchikoshi, 2013). Decoding and linguistic comprehension are independent components of reading comprehension, yet it is their interaction, particularly for struggling readers or nonreaders, that predicts reading comprehension (Hoover & Gough, 1990; Joshi & Aaron, 2000). One recent study found that language comprehension (measured with oral narrative skills and syntactic skills) and decoding and the interaction between them accounted for a significant amount of variance in Chinese reading comprehension at Grade 1 with a group of native Cantonese-speaking children (Yeung et al., 2016).

Some studies, using hierarchical regression analysis, have reported that the interaction between L2 English vocabulary and L2 English decoding accounted for some of the variance in L2 English reading comprehension with emerging bilinguals (e.g., Pasquarella, Gottardo, & Grant, 2012). Pasquarella and colleagues found that with adolescent students who were in the early stages of acquiring English and had only lived in Canada for an average of 2.5 years, English decoding, English vocabulary, and the product of decoding and vocabulary knowledge were all significantly related to reading comprehension. However, for English monolingual students, only vocabulary was significantly related to reading comprehension. The authors suggest that this may be due to the fact that the decoding skills of English monolingual adolescents were already accurate and fluent by this age. In line with the Simple View of Reading, longitudinal studies have demonstrated that there may be developmental shifts in the contribution of word reading and vocabulary to reading comprehension outcomes (e.g., Catts et al., 2005; Kim, 2010; Ouellette & Beers, 2010). As decoding skills became well established, the unique contribution of word reading to vocabulary decreased over time from 27% in second grade to 13% in fourth grade to 2% in eighth grade (Catts et al., 2005).

We also need to consider DLLs' L1 abilities. For DLLs in the US, school is often their first formal encounter with English and they may enter kindergarten with insufficient English vocabulary. However, they come with L1 vocabulary knowledge and L1 oral proficiency skills (e.g., Mancilla-Martinez & Lesaux, 2010; Uchikoshi, 2014). We therefore need to understand the role of L1 in L2 English reading comprehension. Findings on the existence and strength of cross-language associations between early vocabulary and later reading comprehension have been mixed. Many have reported null relationships (Gottardo & Mueller, 2009; Lesaux et al., 2010; Lindsey, Manis, & Bailey, 2003; Mancilla-Martinez & Lesaux, 2010); however, a few have noted some L1-to-L2 relationships (Nakamoto, Lindsey, & Manis, 2008; Proctor August, Carlo, & Snow, 2006).

Of the studies finding cross-language associations between L1 vocabulary and L2 reading comprehension, few show an interaction effect between L1 vocabulary and L2 decoding which explain a small variance in L2 English reading comprehension. For example, Nakamoto and colleagues (2008), studying sixth-grade Spanish-English DLLs in the US, found that only for strong English decoders did third-grade Spanish vocabulary explain a small percentage of variance in English reading. Proctor and colleagues (2006) found that the interaction between Spanish vocabulary and English fluency had an effect on L2 English reading comprehension with a group of 135 Spanish-English bilinguals whose average age was 10 years and 1 month. Their findings suggest that children whose English reading was faster and more accurate benefited more from Spanish vocabulary knowledge than their peers who were slower and less accurate English readers. However, the authors note that the variation explained by this interaction was small and indicates that L1 development is not a prerequisite for Spanish-English bilinguals to do well on English reading comprehension.

In sum, it appears that some studies have found cross-language effects, but only very small ones. Moreover, the interaction between oral language competence and decoding has mainly been examined with vocabulary as the oral language variable.

Role of Narrative Skills in Reading

Among the various features of oral language proficiency, narrative ability (Catts, Fey, Zhang, & Tomblin, 1999; Dickinson & Tabors, 2001; Griffin et al., 2004; Reese, Suggate, Long, & Schaughency, 2010) also shows exceptional promise as a precursor to literacy for monolingual children. Bilinguals, like monolinguals, learn to produce narratives in both L1 and L2 from preschool to school age (Chen & Yan, 2011; Fiestas & Peña, 2004; Gutiérrez-Clellen, 2002; Squires et al., 2013; Uccelli & Páez, 2007).

Narratives have typically been analyzed at two levels: microstructure and macrostructure. Microstructure includes linguistic elements like vocabulary and grammar, both of which have been shown to play a role in the development of reading proficiency for monolingual and bilingual children (Lindsey et al., 2003; Proctor, August, Snow, & Barr, 2010). Vocabulary has been measured by mean length of utterance (MLU), number of different words (NDW), and words per minute (WPM). Macrostructure measures the overall coherence of a story, the story structure, the relationships among events, and character development (Heilmann, Miller, Nockerts, & Dunaway, 2010). Analyses of microstructure

and macrostructure in the two languages of DLLs—unlike standardized language-specific tests, such as a standardized vocabulary production measure (Miller et al., 2006)—allow for direct comparison of language abilities in bilinguals across languages. Moreover, we can evaluate cross-language and within-language transfer issues better with assessment tools that (a) are equivalent across languages and (b) evaluate more language features.

Research on bilinguals suggests that microstructure and macrostructure are correlated once a certain level of L2 proficiency has been achieved (Bedore, Peña, Gilliam, & Ho, 2010; Crosson & Lesaux, 2010; Geva, Wade-Wooley, & Shany, 1997; Verhoeven, 2004; Viberg, 2011) Additionally, there appear to be within- and cross-language relations between microlevel and macrolevel domains in narratives (Lucero, 2015; Squires et al., 2013; Uccelli & Páez, 2007).

Moreover, there is evidence of within subject cross-linguistic relations between macrolevel domains in narratives. Past studies show transfer of story elements from one language to another with Spanish-English bilingual preschoolers (Fiestas & Peña, 2004), Cantonese-English bilingual 4- and 5-year olds (Rezzonico et al., 2016), Spanish-English bilingual kindergarten and first graders (Squires et al., 2014), and English-Hebrew speaking preschoolers (Iluz-Cohen & Walkter, 2012). However, there were no evidence of within subject cross-linguistic transfer between vocabulary and morphsyntax in the bilinguals' two languages.

Oral narrative microstructure and macrostructure performance have been found to predict reading proficiency with monolingual English speakers. Catts and colleagues (1999) found, in a study with 604 monolingual English-speaking kindergarten students, that English oral language proficiency—measured by story retell vocabulary and grammar—uniquely explained the variances in their second-grade English reading comprehension and word recognition. Then, Griffin and colleagues (2004) found that monolingual English-speaking children's narrative quality at age five—specifically, the use of evaluative words and the use of words that portray a character's physical, cognitive, and emotional states—predicted their third-grade reading comprehension. Reese and colleagues (2010) also found that narrative quality at age seven predicted reading skills in a group of monolingual English-speaking children in New Zealand both concurrently and one year later, even after controlling for their receptive vocabulary and early decoding.

Using both vocabulary and narrative recalls to measure oral language, one study supported a cyclical relationship between reading and oral language in a longitudinal study of 626 monolingual English-speaking students from low-income households (Storch & Whitehurst, 2002). Although the authors found significant relations between oral language abilities and literacy in preschool, those relations had disappeared by kindergarten and were still found to be irrelevant through second grade. However, in the third and fourth grades, oral language abilities once again had a strong and direct link to reading comprehension.

Research on narrative skills predicting reading comprehension with DLLs is limited. In the few existing studies, it appears that a combination of micro- and macrostructures in narratives predicts reading comprehension. Miller et al. (2006) investigated the relations

between narrative and reading comprehension for Spanish-speaking bilingual students. In a cross-sectional study of 1,531 students in kindergarten through third grade, Miller and colleagues analyzed narratives elicited using the Frog Stories for both narrative productivity (MLU, NDW, and WPM) and narrative quality (using the Narrative Scoring Scheme (NSS), an index of ability to produce a coherent narrative). Multiple regression results show that these four English narrative measures explained 22% of the variation in English reading comprehension. Regression analysis also revealed significant—though small—cross-language transfer effects: Spanish oral narrative measures explained 2% of the variance in English reading comprehension, controlling for grade and English oral language measures. Whether this significance remains after word reading and vocabulary skills are controlled for was not examined, as this study did not measure them.

Research on the role of narrative skills in reading comprehension of young Cantonese-speaking ELLs from low-socioeconomic-status families in the United States is also limited. In an earlier study using multiple regression analysis (Uchikoshi, Yang, Lohr, & Leung, 2016), we found that the ability to produce a coherent oral narrative explained a small variance in English reading comprehension, similar to Miller et al.'s (2006) findings. However, whether this significance remains after word reading and vocabulary skills are controlled for was not examined.

The Present Study

To address the gaps of previous literature, in this study we examined the role of narrative skills, in both L1 and L2, in English reading comprehension, after controlling for vocabulary and decoding. In order to answer this question, we first examined the vocabulary, narrative, and word reading skills in English and in L1 for Spanish-English and Cantonese-English DLLs in first grade. Then, we examined the L2 reading comprehension skills for Spanish-English and Cantonese-English DLLs in the spring of second grade, after nearly three years of reading instruction. Finally, we addressed the unique role of first-grade narrative skills, after controlling for first-grade vocabulary and word reading, in DLLs' L2 reading comprehension in second grade.

Winter of first grade was chosen to assess decoding, vocabulary, and oral narrative skills, since by this time all children would have been formally exposed to English for over 1.5 years. Follow-up reading comprehension data was collected in the spring of second grade, by which time most children could read on their own (Garcia & Cain, 2014).

Research Design and Methods

Participants

The data in this study are part of a larger three-year longitudinal study examining the bilingual development of Spanish-English and Cantonese-English DLLs. Only measures relevant to the present study will be discussed here. The sample in this study consisted of 53 Spanish-English DLLs and 59 Cantonese-English DLLs. All 112 children were assessed once in the spring of first grade and again in the spring of second grade. While the majority in both groups were American-born, most of the Cantonese-speaking parents were born in

Hong Kong and Guangzhou, China and most of the Spanish-speaking parents were born in Mexico. Only children who spoke Spanish or Cantonese as their home language, as reported by their parents on the home language survey given by the school district or as noted by teachers based on their observations of parent-child interactions, were recruited for the study.

The data reported here were collected from six K–5 elementary schools in two urban school districts in Northern California. All six schools had similar high percentages (75% or more) of children with free/reduced lunch status, an indicator of low socioeconomic status in US. schools. Three of the schools offered both Spanish-English and Cantonese-English "early-exit" transitional bilingual programs, which is the most common form of bilingual education in the US (Genessee, 1999). It uses L1 to ensure grade-level mastery of academic content, but only until the children can make a full transition to English-only instruction. The programs usually begin at kindergarten with 90% instruction in L1 and 10% in English, as the majority of children have limited English abilities. The goal is to place students in English-only instruction by third grade. In our participating schools, approximately 60–90% of class time in second grade was in English and the rest was in their L1 (Uchikoshi and Maniates, 2010).

Children from both bilingual and mainstream programs were recruited to ensure varied L1 and L2 proficiencies. Children were enrolled in bilingual (62 out of 112 students) or mainstream programs (50 out of 112 students) based on parental preference, in consultation with the school administration and kindergarten teachers. For the Cantonese-speaking children, 28 were in bilingual programs, while 31 were in mainstream classrooms. For the Spanish-speaking children, 34 were in bilingual programs, while 19 were in mainstream classrooms. The Spanish-English and Cantonese-English DLLs in the mainstream programs were in classes together. Those in the bilingual programs were in separate classrooms. All teachers addressed the state standards in their instruction and used the same state-adopted reading textbooks. Each school had weekly grade-level teacher meetings in which bilingual classroom teachers and mainstream classroom teachers discussed curriculum and standards to ensure that similar content was being taught in all classrooms.

Cantonese-English and Spanish-English DLL first-graders were given consent forms to take home. The return rate averaged 73%, but individual classroom rates ranged from 60% to 98%. According to the teachers, there appeared to be no pattern to the lack of return of the consent forms.

To investigate the children's home literacy environment and background, a questionnaire was sent home in both English and the native language in the spring of kindergarten. Parents were asked at what age their child had first been exposed to English, at what age their child had started kindergarten, how many children's books they had at home, both in L1 and English, and what level of education the mother had reached. Results are shown in Table 1.

A one-way analysis of variance (ANOVA) conducted to examine the differences among the four groups on mother's education found no significant differences, $F(3, 99) = 0.52$, $p < 0.67$; on average, mothers had attended some high school. A two-way ANOVA for language

(Spanish and Cantonese) and program (bilingual and mainstream) on age of first exposure to English revealed a significant main effect of language, $F(1, 93) = 6.56$, $p = .012$, with Spanish-English DLLs first exposed to English later than Cantonese-English DLLs. The main effect of program was not significant, $F(1, 93) = 0.17$, $p = .69$. The interaction between program and language on age of first exposure to English was also not significant, $F(1, 93) = 0.23$, $p = .63$. A two-way ANOVA for language and program on age of kindergarten entry also revealed no significant main effects of language and program. For number of L1 books in the house, a two-way ANOVA for language and program revealed a significant main effect of program, $F(1, 90) = 11.66$, $p = .001$; children in bilingual programs had more L1 books than their mainstream counterparts had. There was no effect of language or of interaction between language and program. A two-way ANOVA for language and program on number of English books in the house revealed no main effects of language and program. A two-way ANOVA for language and program on mother's education also revealed no significant main effects of language or program.

Overall, the background characteristics of the four groups were similar. The only main difference was in the number of L1 books in the home, with children in bilingual programs having more, suggesting that they had more exposure to L1 at home.

Measures

All children were individually tested, on two separate days, in both their home (L1) and school (English) languages, by trained research assistants who were native speakers of English, Cantonese, or Spanish. Language order of the tests given was random. The research assistants received a full day of training on how to conduct the assessments. They then practiced giving the assessments and were observed on their first day of giving assessments to the subjects in this study. Weekly meetings were held during the data-collection period to ensure fidelity and consistency. Most of the children were assessed between January and March of first grade and January and March of second grade. Each testing session lasted approximately 30 minutes. Vocabulary, decoding, and narrative measures were collected in first grade. The reading comprehension measure was collected in second grade.

Standardized measures were used for vocabulary and reading measures. Although these instruments were standardized on monolingual populations, they were chosen for several reasons. First, no language and literacy tests standardized on bilingual children were available at the time. Second, there were Spanish and Cantonese versions of the English vocabulary test. Third, the tests meet basic technical requirements (Dunn & Dunn, 1997; Dunn, Padilla, Lugo, & Dunn, 1986; Lu & Liu, 1998; Woodcock, 1991) and have been widely used with bilingual children (e.g., Kim & Pallante, 2012; Lesaux et al., 2010; Nakamoto et al., 2008; Pasquarella et al., 2012; Proctor et al., 2006). It is important to note that when interpreting the results of these standardized tests with a bilingual population, we are comparing bilingual children to norms that have been developed for monolingual children. However, as the measures have been standardized on a norming population of monolingual English, Spanish, or Cantonese speakers, this allowed us to analyze these descriptive statistics from a comparative perspective (McCardle, Mele-McCarthy, & Leos, 2005).

Vocabulary in first grade.—English receptive vocabulary was measured with the Peabody Picture Vocabulary Test (PPVT-3) (Dunn & Dunn, 1997; Dunn et al., 1986; Lu & Liu, 1998). The child was asked to select the picture from an array of four that best matched the spoken word presented by the assessor. Reported reliability from the norms for children at age six is .94 (Dunn & Dunn, 1997). We used the Spanish version of the PPVT, the Test de Vocabulario Imagenes—Peabody (Dunn et al., 1986), to measure Spanish receptive vocabulary and the Cantonese version of the PPVT-R (Lu & Liu, 1998) to measure Cantonese receptive vocabulary.

Oral narration in first grade.—Narrative samples were elicited using the wordless picture book, *Frog, Where Are You?* (Mayer, 1969). Narratives were collected in English and L1 on two separate days. The child was asked to look at the book page by page and then was prompted to tell a story to coincide with the illustrations. The child was allowed to look at the book while telling the story. The examiner sat across from the child so as to promote child language, minimize pointing, and encourage the use of explicit labels for characters, objects, and actions. The “frog story” task is widely used as a measure of language ability (e.g., Karlsen et al., 2016; Miller et al.,2006).

All stories were audio-recorded. The recorded narratives were transcribed and verified by trained native-English-speaking research assistants. An initial transcription was completed by a single transcriber and reviewed by a second transcriber. Transcribed narratives were analyzed for narrative productivity and narrative quality. Narrative productivity was measured with number of different words (NDW) and total number of words (TNW). NDW measures vocabulary diversity in narratives that has shown to significantly correlate with age, $r = .71$ (Miller, 1987).

Narratives were then coded for narrative quality using the Narrative Scoring Scheme (NSS) (Heilmann et al., 2010), an index of the ability to produce a coherent narrative. It consists of seven categories derived from story grammar categories, but adding specific referencing, use of mental state verbs, and coherence. Each category is holistically scored using a five-point scale: 5 for proficient use, 3 for emerging or inconsistent use, 1 for immature or minimal use, and 0 for poor performance or if the child did not tell the story or give a narrative in the language being tested. The seven narrative elements were: introduction, character development, mental states, referencing, conflict/resolution, cohesion, and conclusion. A professional transcribing and coding company coded the Spanish and English narratives. Cantonese narratives were coded by trained, native-Cantonese-speaking researchers. For reliability of coding, 20% of the narratives were randomly selected and independently scored by a trained researcher. The Cohen’s kappa statistic, which corrects for chance agreement (Bakeman & Gottman, 1997), was .85.

Decoding in first grade.—The first-graders were tested with the letter-word identification subtest of the Woodcock Language Proficiency Battery (WLPB) (Woodcock, 1991) in English. This measures reading identification skills with isolated letters and words. The items become more difficult as less-frequently-used words are tested. Reported split-half reliability from the norms for children at age six is .96 (Woodcock, 1991).

Reading comprehension in second grade.—The DLLs were also tested with the reading comprehension subtest of the WLPB in English, one year later in second grade. On this cloze-type reading comprehension test, the children silently read short passages in order of increasing difficulty and have to orally provide the missing word. Reported split-half reliability from the norms for children at age six is .95 (Woodcock, 1991).

Statistical Analysis

All raw scores were converted to standard scores for the standardized assessments. Then, ANOVA were conducted on the measures between the Cantonese-English DLL and Spanish-English DLL groups. Then we conducted correlational analysis and multiple regression analysis to further examine the relationships between oral proficiency and reading comprehension.

Results

Group differences based on children's L1 (Spanish vs. Cantonese) and program (bilingual vs. mainstream) were examined. Table 2 presents the means, standard deviations, and ranges of scores for vocabulary, narrative, and reading skills by group.

Vocabulary

A two-way ANOVA for language and program on first-grade English vocabulary revealed a significant effect of language, $F(1, 108) = 4.25$, $p = .04$. On average, first-grade Cantonese-English DLLs performed better on English vocabulary than first-grade Spanish-English DLLs. The main effect of program was also significant, $F(1, 108) = 16.26$, $p < .001$. On average, first-graders in mainstream programs performed better on English vocabulary than first-graders in bilingual programs. The interaction between program and language was not significant. A two-way ANOVA for language and program on first-grade L1 vocabulary revealed a significant effect of language, $F(1, 108) = 6.65$, $p = .011$. On average, first-grade Spanish-English DLLs had significantly higher L1 vocabulary than first-grade Cantonese-English DLLs. The main effect of program was also significant, $F(1, 108) = .5.69$, $p = 0.19$. On average, children in bilingual programs had significantly higher L1 vocabulary than children in mainstream programs. The interaction between program and language was not significant.

Narratives

All the children engaged easily in the narration task and produced a narrative. A series of two-way ANOVA were conducted on English and L1 narrative measures. A two-way ANOVA for language and program on the first-grade English narrative quality measure, NSS, revealed no main effects of language and program. A two-way ANOVA for language and program on first-grade L1 narrative quality revealed a significant main effect of language, $F(1, 108) = 5.60$, $p = .02$, and a significant effect of program, $F(1, 108) = 16.92$, $p < .001$. First-grade Spanish-English DLLs had higher L1 narrative quality than first-grade Cantonese DLLs. Additionally, first-graders in bilingual programs had higher L1 narrative quality than first-graders in mainstream programs.

A two-way ANOVA for language and program on first-grade English TNW revealed a significant main effect of language, $F(1, 108) = 9.87$, $p = .002$. On average, Spanish-English DLLs had a greater total number of words in English narratives than Cantonese-English DLLs. There was no significant effect of program or of interaction between language and program. A two-way ANOVA for language and program on first-grade L1 TNW revealed a significant effect of program, $F(1, 108) = 6.18$, $p = .014$. On average, children in bilingual programs had a greater total number of words in L1 narratives than children in mainstream programs. There was no significant effect of language or of interaction between language and program.

Furthermore, a two-way ANOVA for language and program on first-grade English NDW revealed a main effect of program, $F(1, 108) = 6.21$, $p = .014$. Children in mainstream programs had a greater NDW in their English narratives than children in bilingual programs. There was no significant effect of language or of interaction between language and program. A two-way ANOVA for language and program on L1 NDW in first grade also revealed a main effect of program, F (1, 108) = 5.50, p = .021. Children in bilingual programs had a greater NDW in their L1 narratives than children in mainstream programs. There was no significant effect of language or of interaction between language and program.

Reading Achievement

For the English reading measures, both groups on average scored at or above the published monolingual English mean. A two-way ANOVA for language and program on first-grade English word reading revealed a significant main effect of language, $F(1,108) = 4.43$, $p = .038$. First-grade Cantonese-English DLLs had significantly higher English word-reading skills than first-grade Spanish-English DLLs. There was no significant effect of program or of interaction between language and program.

A two-way ANOVA for language and program on second-grade English reading comprehension also revealed a significant main effect of language, $F(1,08) = 10.75$, $p = .001$. Second-grade Cantonese-English DLLs scored significantly higher than second-grade Spanish-English DLLs on English reading comprehension. There was no significant effect of program or of interaction between language and program.

Relationships among Variables

We conducted separate correlational analyses among the variables for Spanish-English and Cantonese-English DLLs (see Table 3). Results revealed a positive, moderate within-language association among the narrative variables for both groups. There was also a moderate within-language association between vocabulary and narrative scores in English for both groups. The Cantonese group had a strong positive association between L1 vocabulary and all L1 narrative variables, while the Spanish group showed only moderate association between L1 vocabulary and L1 narrative quality. For the Spanish-English DLLs, English vocabulary, Spanish vocabulary, English NSS, English NDW, English TNW, and English word reading were moderately and positively correlated with English reading comprehension. For the Cantonese-English DLLs, only English vocabulary and English word reading were moderately correlated.

Multiple Regression Analysis

To examine the unique contribution of each construct in explaining variability in second-grade English reading comprehension scores, we conducted several series of fixed-order hierarchical regression analyses. Reading comprehension was the dependent measure. Our research questions guided the order of entering the variables in the models. Table 4 shows the within-language models with only English variables, and Table 5 shows the cross-language model with L1NSS.

First, dummy variable codings of language (1 for Spanish, 0 for Cantonese) and program (1 for bilingual, 0 for mainstream) were entered in the model (M0 in both Tables 4 and 5). Language and program accounted for 12% of the variance in English reading comprehension, $F(2, 109) = 7.31$, $p = .0011$. Although program was not significant, it was kept in the model to control for program differences.

As past research shows decoding to be a key predictor of reading comprehension, English decoding was entered next. Introducing the first-grade decoding variable (M1 in both Tables 4 and 5) explained an additional 32% of variation in English reading comprehension and the change in R^2 was significant, $F(1,108) = 61.43$, $p < .0001$. The models in the following steps were compared to this model.

Vocabulary was added next since it is often used as a proxy for oral comprehension and has been shown to predict reading comprehension. Adding English vocabulary to the regression model (M2 in Table 4 and M2b in Table 5) explained an additional 9% of the variation in English reading comprehension and the change in R^2 was significant, $F(1,107) = 21.29$, $p < .0001$. The interaction between English vocabulary and decoding was tested, but was not significant. Native language vocabulary was also added to M1 (M2a in Table 5), but this did not explain as much variance as the model with English vocabulary did (M2b in Table 5).

To examine whether narrative skills explain additional variance in English reading comprehension and to test the interaction between narrative skills and decoding as proposed in the Simple View of Reading, narrative and the interaction between narrative skills and decoding were added to Model 2 in Table 4 and Model 2b in Table 5. The addition of English NSS and the interaction between English NSS and English decoding (M3 in Table 4) to the regression model explained an additional 3% of the variation in English reading comprehension and the change in R^2 was also significant, $F(2,105) = 4.23$, $p = .0171$. To examine whether native language NSS would explain additional variance, L1 NSS and the interaction between L1 NSS and English decoding were entered in the model (M3 in Table 5). This model explained an additional 4% of the variation in English reading comprehension and the change in R^2 was also significant, $F(2,106) = 3.54$, $p = .0326$. Other narrative measures (NDW and TNW) were initially included in the models, but were not significant.

As both M3 in Tables 4 and 5 were significantly different from M2, both were chosen as final models. It appears that L1 NSS and English NSS make similar contributions to explaining the variance in English reading comprehension. After controlling for language, program, and first-grade English decoding and English vocabulary scores, NSS (in either L1

or English) was associated with second-grade English reading comprehension. These models accounted for a total of 56% (for English NSS) to 57% (for L1 NSS) of the variance in English reading comprehension. Children with higher English decoding skills benefitted more from narrative quality skills (in either L1 or English) than peers with less decoding skills. However, it should be noted that the variation explained by narrative quality and the interactions was small.

Interestingly, whether a child was in a bilingual program or a mainstream program had no effect on L2 reading comprehension. Whether a child spoke Spanish or Cantonese as their home language was related to L2 English reading comprehension. Spanish-English DLLs scored significantly lower than Cantonese-English DLLs on English reading comprehension after controlling for program, English vocabulary, English decoding, and narrative quality. There was also an interaction between NSS and English decoding skills, suggesting that the effect of NSS on English reading comprehension depended on the level of English decoding skills. Figure 1 plots the slopes for the interaction.

Discussion

This study was undertaken to investigate the role of narrative skills in English and in L1 in English reading comprehension skills one year later, after controlling for English vocabulary and English decoding skills for Spanish-English and Cantonese-English DLL children. Such an investigation is worth conducting because standardized vocabulary assessments are commonly used to measure oral proficiency, but little is known about the role of narrative skills in reading comprehension for DLLs. Our results add to the research on DLL reading in three ways.

First, multiple regression results show a difference in English reading comprehension between the Spanish-English DLLs and the Cantonese-English DLLs. The difference in scores was negatively associated with Spanish-English DLLs scoring lower than the Cantonese-English DLLs on L2 English reading comprehension. From the descriptive data, we found that Spanish-English DLLs had significantly lower English receptive vocabulary but higher L1 receptive vocabulary than their Cantonese peers. This lower English vocabulary appears to be contributing to the Spanish-English DLLs' lower English reading comprehension scores. In regards to their L1 receptive Spanish vocabulary standard scores, the Spanish-English DLLs scored close to the published monolingual-Spanish children's average, suggesting that they had monolingual age-appropriate ability to understand Spanish. Unfortunately, we do not have detailed qualitative home observations to help explain why the Spanish-English DLLs had stronger L1 vocabulary knowledge and weaker L2 English ones than the Cantonese-English DLLs. Both groups lived in neighborhoods with high concentrations of residents and merchants speaking their home languages. Furthermore, their neighborhood libraries had Chinese or Spanish children's books available, suggesting equivalent L1 exposure in the neighborhoods. Future studies might examine family language policies and practices and conduct qualitative analysis to better understand DLLs' language exposure and parental expectations.

Second, multiple regression results show no differences in L2 English reading comprehension between DLL children in bilingual programs and those in mainstream English programs after controlling for L1. This suggests that attending a bilingual program does not disadvantage these children's English development. This result may be due to the fact that unlike past studies comparing children from different L1 backgrounds, ours studied Cantonese-English DLLs and Spanish-English DLLs who went to the same schools. In mainstream classrooms, the two groups were in the same classrooms. In bilingual classrooms, although the groups were in separate classrooms, the teachers met weekly in grade-level meetings and took care that similar content was taught in all classrooms. Moreover, all teachers addressed the state standards in their instruction and used the same state-adopted reading textbooks.

Third, and most surprising was that regression results revealed a significant, albeit small, effect of narrative quality (both within- and cross-language) on English reading comprehension one year later, after controlling for English decoding and English vocabulary. English decoding and vocabulary did not capture all of the variation in L2 English decoding, suggesting that vocabulary knowledge at this early literacy stage is insufficient for capturing the "C" (linguistic comprehension) portion in the R = D x C of the Simple View of Reading.

There seems to be three explanations for these findings. First it may be that the skills involved in narrating a story -- elaborating on events and describing character development - in either L1 or L2 – are all important elements in reading comprehension. This suggests that skills needed to be proficient in narrative discourse are related to the skills needed to comprehend written text. This explanation would support reading stories to young children in either or both L1 and L2 to help in their future reading comprehension skills. If young children are read to and are familiar with story elements, by the time they learn to read, they will already have the necessary skills to comprehend written text.

Alternatively, it may be that cross-language ability matters, albeit small. It may be the case that once children's decoding becomes automatic, children's can then tap into their native language skills to understand L2 written text. This explanation would support past literature that suggests that story elements can be transferrable between languages with Spanish-English bilinguals (Fiestas & Peña, 2004; Squires et al., 2014), Cantonese-English bilinguals (Rezzonico et al., 2016), and English-Hebrew bilinguals. (Iluz-Cohen & Walkter, 2012). This would then validate the importance of the home language maintenance and provide evidence for children to continue to receive instructional support in the L1.

Another explanation would be that we need to look beyond measuring language with expressive or receptive vocabulary standardized tests like the PPVT, since 4% of the variability in English reading comprehension could be captured with narrative abilities in this study. This suggests that narrative skills may provide more insights into children's oral proficiency than a standardized assessment. This explanation would support findings from the National Early Literacy Panel.

Future research is needed to determine which explanation best explains the effect of narrative quality on reading comprehension. For example, a future study might include a composite oral language variable instead of results from standardized receptive vocabulary assessments. If L2 linguistic comprehension were to be a composite made of L2 vocabulary and other L2 factors, such as L2 listening comprehension and/or L2 narrative skills, would L1 oral language measures still explain some of the variance in L2 reading comprehension?

A strength of this study relative to others is our use of the same elicitation material across conditions and the inclusion of two bilingual populations enrolled in the same schools. These allow us to compare populations in both L1 languages without concerns about comparability. Nonetheless, the study has limitations. One is its relatively small sample size. It would take larger samples to arrive at more definite answers. Moreover, currently this study has a borderline subjects-to-measures ratio, which increases the possibility of a Type II error. With a larger sized sample, less variation may be explained by the model resulting in some of the variables to lose significance. Another limitation is the use of regression analysis. Given this, conclusions should be drawn cautiously. Future research might consider measuring different components of language and literacy and using more robust modeling techniques such as longitudinal structural equation modeling. Future research examining models of reading comprehension with different assessments of comprehension would enrich our understanding of the reading comprehension processes of emerging bilinguals.

Although our research is exploratory and therefore far from definitive, our findings contribute to the growing field of bilingual narrative and reading research.

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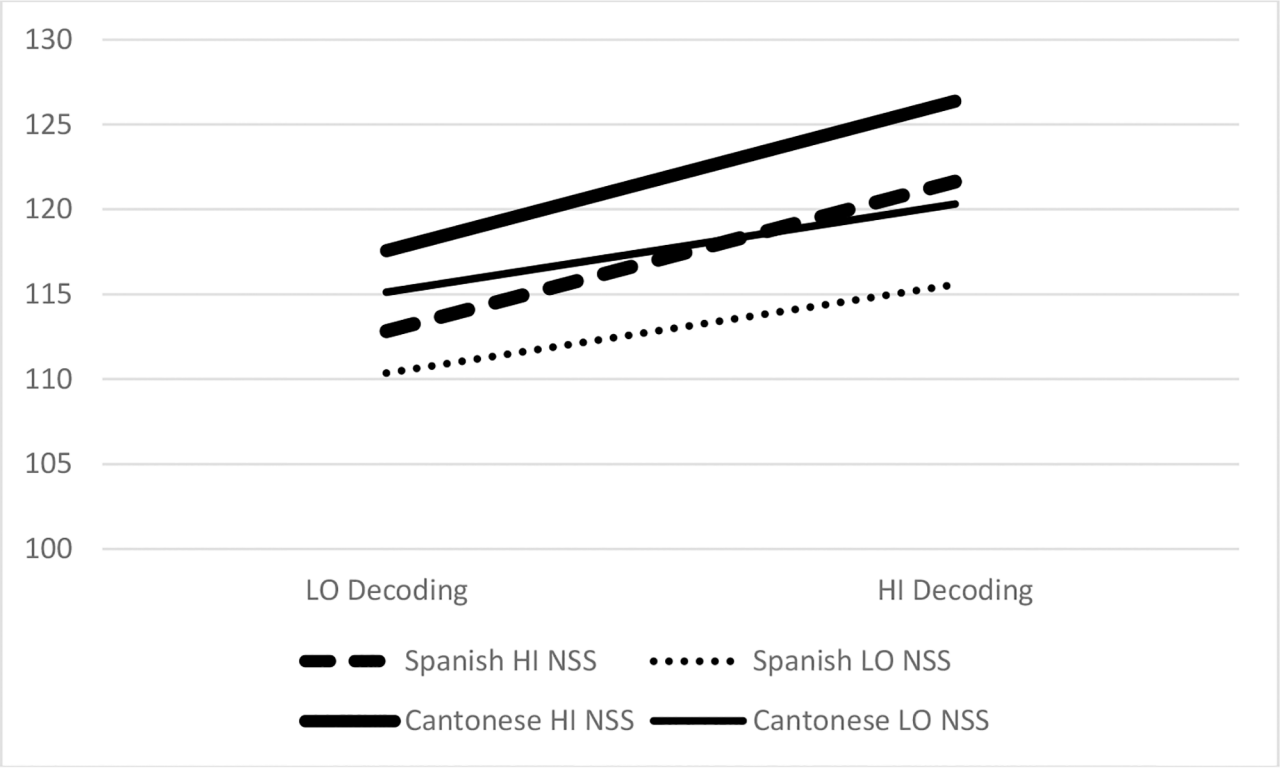

Figure 1.

Plot of interaction between NSS and Decoding by Native Language Group. HI is defined as scoring at the 75th percentile, while LO is defined as scoring at the 25th percentile. For this Figure, home language L1 NSS is used; but L2 English NSS yields similar results.

Table 1

Home Literacy Environment and Background

Variables	Total Range	Total Mean (*SD*)	Bilingual Spanish (*SD*)	Mainstream Spanish (*SD*)	Bilingual Cantonese (*SD*)	Mainstream Cantonese (SD)
Age of first	0–6	2.93	3.28	3.55	2.64	2.62
English exposure		(1.40)	(1.69)	(1.51)	(1.06)	(1.24)
(years)		(n=97)	(n=29)	(n=11)	(n=28)	(n=29)
Kindergarten start	56–69	62.53	62.79	63.26	62.25	62.03
age (months)		(3.75)	(3.57)	(3.65)	(4.01)	(3.87)
		(n=112)	(n=34)	(n=19)	(n=28)	(n=31)
No. of LI books	1–3	1.41	1.61	1.08	1.56	1.17
		(0.65)	(0.76)	(0.28)	(0.70)	(0.39)
		(n=94)	(n=31)	(n=13)	(n=27)	(n=23)
No. of English	1–3	2.02	1.93	1.92	2.18	2.00
books		(0.78)	(0.87)	(0.76)	(0.77)	(0.67)
		(n=94)	(n=30)	(n=13)	(n=28)	(n=23)
Mother's	0–9	3.68	3.67	3.15	3.75	3.86
education		(1.73)	(2.01)	(2.30)	(1.14)	(1.60)
		(n=103)	(n=33)	(n=13)	(n=28)	(n=29)

Note. Number of books ranged from 0 to 3, where 1 = 1–10 books, 2 = 11–25 books, and 3 = >25 books. Mother's education ranged from 0 to 9, where 0 was none, 1 was some primary education, 2 completed primary education, 3 some high school, 4 graduated from high school, 5 some college/trade school, 6 received associate's degree or trade certification, 7 received bachelor's degree, 8 some graduate study, and 9 received graduate degree.

Table 2

Descriptive Statistics

Variables	Total Range	Total Mean (*SD*)	Bilingual Spanish (n=34) (*SD*)	Mainstream Spanish (n=19) (*SD*)	Bilingual Cantonese (n=28) (*SD*)	Mainstream Cantonese (n=31) (*SD*)
English						
PPVT SS (Gr.l)	40–117	83.87	75.82	87.95	83.07	90.90
		(13.98)	(15.72)	(14.29)	(11.90)	(8.12)
NSS (Gr.l)	7–20	12.63	12.85	13.11	11.68	12.97
		(3.01)	(3.32)	(3.62)	(2.44)	(2.66)
NDW (Gr.l)	30–129	71.69	72.38	78.63	62.86	74.65
		(19.25)	(20.86)	(22.85)	(14.90)	(16.32)
TNW (Gr.l)	84–449	217.29	231.24	250.26	184.29	211.58
		(73.13)	(78.10)	(87.39)	(51.50)	(64.41)
Decoding SS (Gr.l)	28–152	115.69	110.29	113.58	117.68	121.10
		(18.55)	(24.75)	(10.04)	(20.34)	(9.84)
Reading Comp SS (Gr. 2)	64–138	109.95	103.24	109.95	114.86	112.87
		(12.24)	(14.09)	(10.10)	(10.56)	(9.60)
L1						
PPVT SS(Gr.l)	17–131	90.38	99.06	89.68	89.04	82.52
		(18.14)	(19.55)	(16.86)	(13.02)	(18.00)
NSS (Gr.l)	0–25	15.20	18.03	14.16	15.71	12.26
		(5.07)	(3.54)	(6.30)	(3.40)	(5.31)
NDW (Gr.l)	0–135	61.88	66.32	56.74	66.64	55.84
		(22.73)	(14.54)	(25.44)	(16.45)	(30.80)
TNW (Gr.l)	0–478	202.66	224.12	185.79	222.79	171.29
		(95.08)	(63.79)	(86.06)	(90.98)	(122.40)

Note. SS is standard score. PPVT is Peabody Picture Vocabulary Test receptive vocabulary, NSS is Narrative Scoring Scheme, NDW is Number of Different Words, TNW is Total Number of Words.

Table 3

Correlations between All Variables by Language Groups

	1	2	3	4	5	6	7	8	9	10
Spanish DLL										
1. English PPVT	-									
2. Spanish PPVT	.03	-								
3. English NSS	.47**	−.06	-							
4. Spanish NSS	−.04	.30*	.01	-						
5. English NDW	.53***	−.08	.72***	.09	-					
6. Spanish NDW	−.11	.22	−.04	.77***	.12	-				
7. English TNW	.32*	−.15	.70***	.13	.86***	.17	-			
8. Spanish TNW	−.10	.21	.07	.74***	.12	.83***	.29*	-		
9. English Decoding	.55***	.21	.37**	.21	.46**	.10	.32*	.14	-	
10. English Reading Comp	.62***	.29*	.32*	.15	.46**	.11	.35*	.15	.80***	-
Cantonese DLL										
1. English PPVT	-									
2. Cantonese PPVT	−.11	-								
3. English NSS	.28*	.09	-							
4. Cantonese NSS	−.13	.61***	.14	-						
5. English NDW	.36**	−.06	.53***	.18	-					
6. Cantonese NDW	−.17	.63***	.04	79***	.23	-				
7. English TNW	.03	.07	.53***	.29*	.80***	.30*	-			
8. Cantonese TNW	−.18	.66***	.02	.74***	.21	92***	.37**	-		
9. English Decoding	.24	.07	.25	.10	.11	−.02	.08	−.07	-	
10. English Reading Comp	.41**	.21	.09	.20	−.01	−.04	−.06	.004	.31*	-

Note. PPVT is Peabody Picture Vocabulary Test receptive vocabulary, NSS is Narrative Scoring Scheme, NDW is Number of Different Words, TNW is Total Number of Words.

* $p<.05$.

** $p<.01$.

*** $p<.0001$

Table 4

Results of Hierarchical Regression of Within-language Variables Contributing to English Reading Comprehension

Model	Parameter Estimate (Standard Errors)							R^2	ΔR^2
	B_0	$B_{Spanish}$	$B_{bilingual}$	B_{LetWd}	$B_{EngPPVT}$	$B_{EFrogNSS}$	$B_{EFrog\_NSS*LetWd}$		
M0	114.74***	−7.85***	−1.96					.12***	.12
	(1.85)	(2.23)	(2.24)						
Ml	68.28***	−4.99**	−.67	.38***				.44***	.32
	(6.11)	(1.82)	(1.80)	(.05)					
M2	50.27**	−3.97*	2.21	.28***	.33***			.53***	.09
	(6.83)	(1.69)	(1.77)	(.05)	(.07)				
M3	89.01***	−3.60*	1.94	−.04	.35***	−3.77**	.03*	.56***	.03
	(16.52)	(1.69)	(1.73)	(.14)	(.07)	(1.42)	(.01)		

Note. Spanish = dummy variable with 1= Spanish as first language; E/Eng= English, LetWd = letter word; PPVT=receptive vocabulary, NSS=Narrative Scoring Scheme.

* $p<.05$.

** $p<.01$.

*** $p<.0001$

Table 5

Results of Hierarchical Regression of Cross-language Variables Contributing to English Reading Comprehension

Model	Parameter Estimate (Standard Errors)								R^2	ΔR^2
	B_0	$B_{spanish}$	$B_{bilingual}$	B_{LetWd}	B_{L1ppvt}	$B_{EngPPVT}$	$B_{L1Frog\ NSS}$	$B_{L1Frog\_NSS*LetWd}$		
M0	114.74***	−7.85***	−1.96						.12***	.12
	(1.85)	(2.23)	(2.24)							
M1	68.28***	−4.99**	−.67	.38***					.44***	.32
	(6.11)	(1.82)	(1.80)	(.05)						
M2a	60.60**	−6.23*	−1.70	.36***	012*				.47***	.03
	(6.78)	(1.86)	(1.82)	(.05)	(.05)					
M2b	50.27**	−3.97*	2.21	.28***		33***			.53***	.09
	(6.83)	(1.69)	(1.77)	(.05)		(.07)				
M3	96.02***	−4 75**	.83	−.13		33***	−2.80*	.03*	.57***	.04
	(20.14)	(1.65)	(1.85)	(.17)		(.07)	(1.24)	(.01)		

Note. Spanish = dummy variable with 1= Spanish as first language; L1= First Language, Eng = English, LetWd = letter word; PPVT=receptive vocabulary, NSS=Narrative Scoring Scheme.

* $p<.05$.

** $p<.01$.

*** $p<.0001$